SDC 19

September 23-26, 2019
Santa Clara, CA

Accelerate Development of SNIA Swordfish™

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Agenda

- SNIA Swordfish™ and Open Source Projects
- More open source that can help with Swordfish
- Where to find more information

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SNIA Swordfish™ and Open Source Projects

- Swordfish comes from the SNIA Scalable Storage Management Technical Work Group (SSM TWG)
- The SSM TWG maintains several open source projects that can accelerate the development of Swordfish implementations
- These open source projects are on GitHub in open repositories under github.com/SNIA

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Swordfish Open Source Projects

- Swordfish API Emulator
- Swordfish Basic Web Client
- Swordfish Datadog Sample Dashboard Integration
- Swordfish Power BI Sample Dashboard Integration
- Swordfish PowerShell Toolkit
- Swordfish Extension to Windows Admin Center
- More open source projects are coming

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Swordfish API Emulator

Swordfish API Emulator

- Emulates a Swordfish system with storage services
- Responds to create, read, update, and delete operations
  - POST, GET, PATCH, DELETE
- Extends the DMTF Redfish Interface Emulator
  - Adds code for Swordfish resources
- Link: https://github.com/SNIA/Swordfish-API-Emulator
- Includes installation, user, and developer documentation

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Swordfish API Emulator Console Output (Default Configuration)

```
(SAE180828) C:\Users\ddon\Documents\SAE180828>python emulator.py
['Redfish']
 * Redfish endpoint at localhost:5000
{'rb': '/redfish/v1/', 'sys_id': 'System-1'}
{'rb': '/redfish/v1/', 'sys_id': 'System-2'}
{'rb': '/redfish/v1/', 'sys_id': 'System-3'}
{'rb': '/redfish/v1/', 'sys_id': 'System-4'}
{'rb': '/redfish/v1/', 'sys_id': 'System-5'}
{'rb': '/redfish/v1/', 'sys_id': 'System-6'}
{'rb': '/redfish/v1/', 'sys_id': 'System-7'}
 * Running in Redfish mode
 * Serving Flask app "g" (lazy loading)
 * Environment: production
   WARNING: Do not use the development server in a production environment.
   Use a production WSGI server instead.
 * Debug mode: off
```

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Swordfish API Emulator Browser Output (Default Configuration)

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localhost:5000/redfish/v1/


```
{
    @odata.context: "/redfish/v1/$metadata#ServiceRoot",
    @odata.type: "#ServiceRoot.1.0.0.ServiceRoot",
    @odata.id: "/redfish/v1/",
    Id: "RootService",
    Name: "Root Service",
    ServiceVersion: "1.0.0",
    UUID: "79ea8662-0349-4390-883c-b917c8f65e6b",
  - Links: {
      - Chassis: {
            @odata.id: "/redfish/v1/Chassis"
        },
      - Managers: {
            @odata.id: "/redfish/v1/Managers"
        },
      - TaskService: {
            @odata.id: "/redfish/v1/TaskService"
        },
      - SessionService: {
            @odata.id: "/redfish/v1/SessionService"
        },
      - StorageServices: {
            @odata.id: "/redfish/v1/StorageServices"
        },
      - StorageSystems: {
            @odata.id: "/redfish/v1/StorageSystems"
        },
      - AccountService: {
            @odata.id: "/redfish/v1/AccountService"
        },
      - EventService: {
            @odata.id: "/redfish/v1/EventService"
        },
      - Registries: {
            @odata.id: "/redfish/v1/Registries"
        },
      - Systems: {
            @odata.id: "/redfish/v1/Systems"
        },
      - CompositionService: {
            @odata.id: "/redfish/v1/CompositionService"
        }
    }
}
```


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More About the Swordfish API Emulator

- Emulator Python Environment
- Installing the Emulator
- Notes About the Emulator
- How the Emulator Works
- Adding New Dynamic Resources
- More About the Emulator

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Emulator Python Environment

- Python 3.6 or above
- virtualenv recommended but not required
- Python packages
  - flask flask_restful flask_httpauth
  - requests aniso8601 markupsafe pytz
  - itsdangerous StringGenerator urllib3

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Installing the Emulator
(Default Configuration)

- Create a folder/directory for the Emulator
- Copy in the Redfish Interface Emulator
- Copy in the Swordfish API Emulator on top of it
- Install the necessary Python packages
- Run with “python emulator.py”

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Emulator Console Output
(Default Configuration)

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(SAE180828) C:\Users\ddon\Documents\SAE180828>python emulator.py
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 * Redfish endpoint at localhost:5000
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{'rb': '/redfish/v1/', 'sys_id': 'System-4'}
{'rb': '/redfish/v1/', 'sys_id': 'System-5'}
{'rb': '/redfish/v1/', 'sys_id': 'System-6'}
{'rb': '/redfish/v1/', 'sys_id': 'System-7'}
 * Running in Redfish mode
 * Serving Flask app "g" (lazy loading)
 * Environment: production
   WARNING: Do not use the development server in a production environment.
   Use a production WSGI server instead.
 * Debug mode: off
```

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Notes About the Emulator

- Read the Redfish Interface Emulator *README.md*
  - Says how to use emulator.py flags and emulator-config.json
- api_emulator\resource_manager.py establishes which resources are static and which are dynamic
  - Static resources are read-only
  - Dynamic resources support CRUD operations
- Swordfish resources are all dynamic, but four of the default configuration Redfish resources are static
  - AccountService, Registries, SessionService, TaskService

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Notes About the Emulator (Continued)

- Static resources are populated by JSON mockup files in the api_emulator\redfish\static directory
  - Only uses static resources identified in “resource_manager.py”
  - Dynamic resources are NOT populated or initialized this way
- Dynamic resources can be populated via the emulator API using CRUD operations (POST, GET, PATCH, DELETE)
- The Redfish Interface Emulator also includes a tool called “Infragen” that can prepopulate dynamic resources
  - This tool is used to instantiate the Redfish resources in the emulator’s default configuration

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Notes About the Emulator (Continued Again)

- An emulator-only function can populate dynamic objects
  - When defined by an api file for a dynamic resource, a POST with an empty body can create a new default singleton instance: POST http://localhost:5000/redfish/v1/Chassis/NewThing {}
  - The new instance (named “NewThing” here) is defined by a template file for the dynamic resource (“Chassis” in this case)
- The Swordfish Basic Web Client uses this emulator-only function to create new Redfish and Swordfish singletons
  - It can then use PATCH operations to alter properties and customize the new dynamic object

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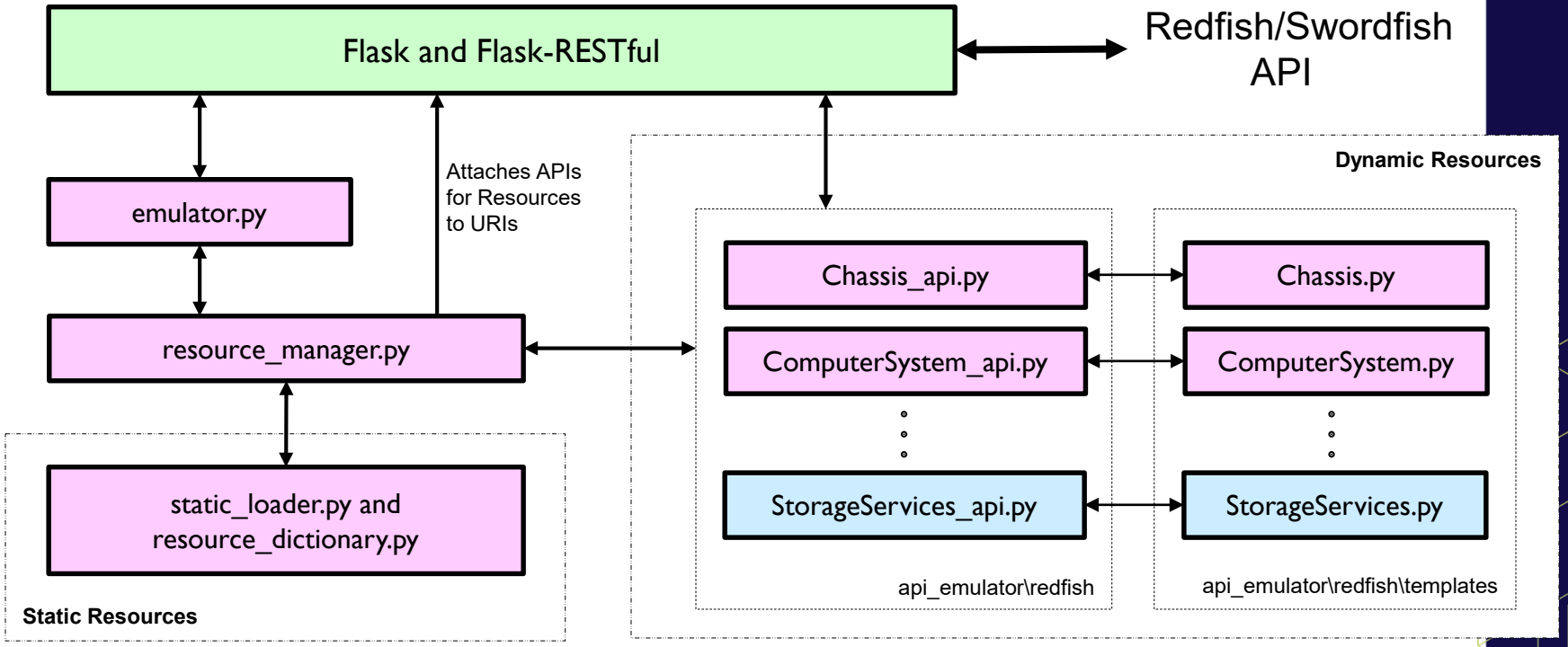
How the Emulator Works



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Adding New Dynamic Resources to the Emulator

- Dynamic resources are enabled by api/template file pairs
  - The api file sets REST behaviors for Collections and Singletons
  - The template file establishes how to create default singletons
- Example api/template files are in api_emulator\redfish
  - “eg_resource_api.py” and “template\eg_resource.py”
  - “eg_subresource_api.py” and “template\eg_subresource.py”
- The example api files show where to handle applicable REST commands for Collections and for Singletons
  - GET, PUT, POST, PATCH, DELETE

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Adding New Dynamic Resources to the Emulator (Continued)

- The example template files show how templates are set up to allow new singleton instances to be created
  - A template is copied, with some things filled in at runtime
- When a new api/template pair is created, it is added to the emulator by editing “resource_manager.py”
  - This will attach the new resource’s APIs to URIs

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More About the Emulator

- Areas where the emulator should improve
  - The remaining static resources should be made dynamic
  - A couple of Redfish-defined URIs are not supported yet

- Feedback is desired
  - About possibilities as well as issues

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Swordfish Basic Web Client

Swordfish Basic Web Client

- Web client that can connect to multiple Redfish and/or Swordfish services simultaneously
- Presents the Redfish and Swordfish hierarchy in a browser web frame
- Provides basic capabilities for viewing resources and updating properties that are writeable
- Link: https://github.com/SNIA/Swordfish-basic-web-client
- Includes installation, user, and developer documentation

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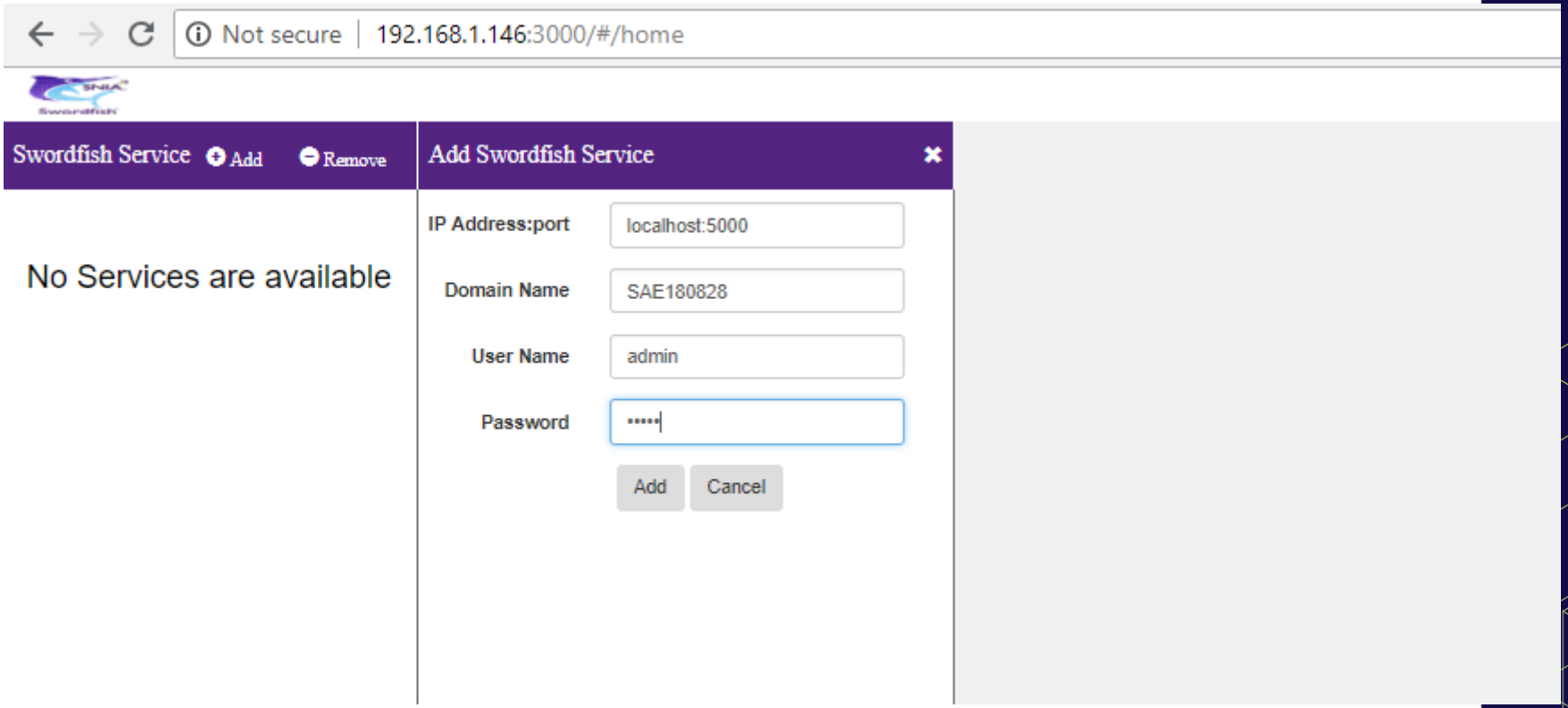
Swordfish Basic Web Client Screen Output (Service Login)



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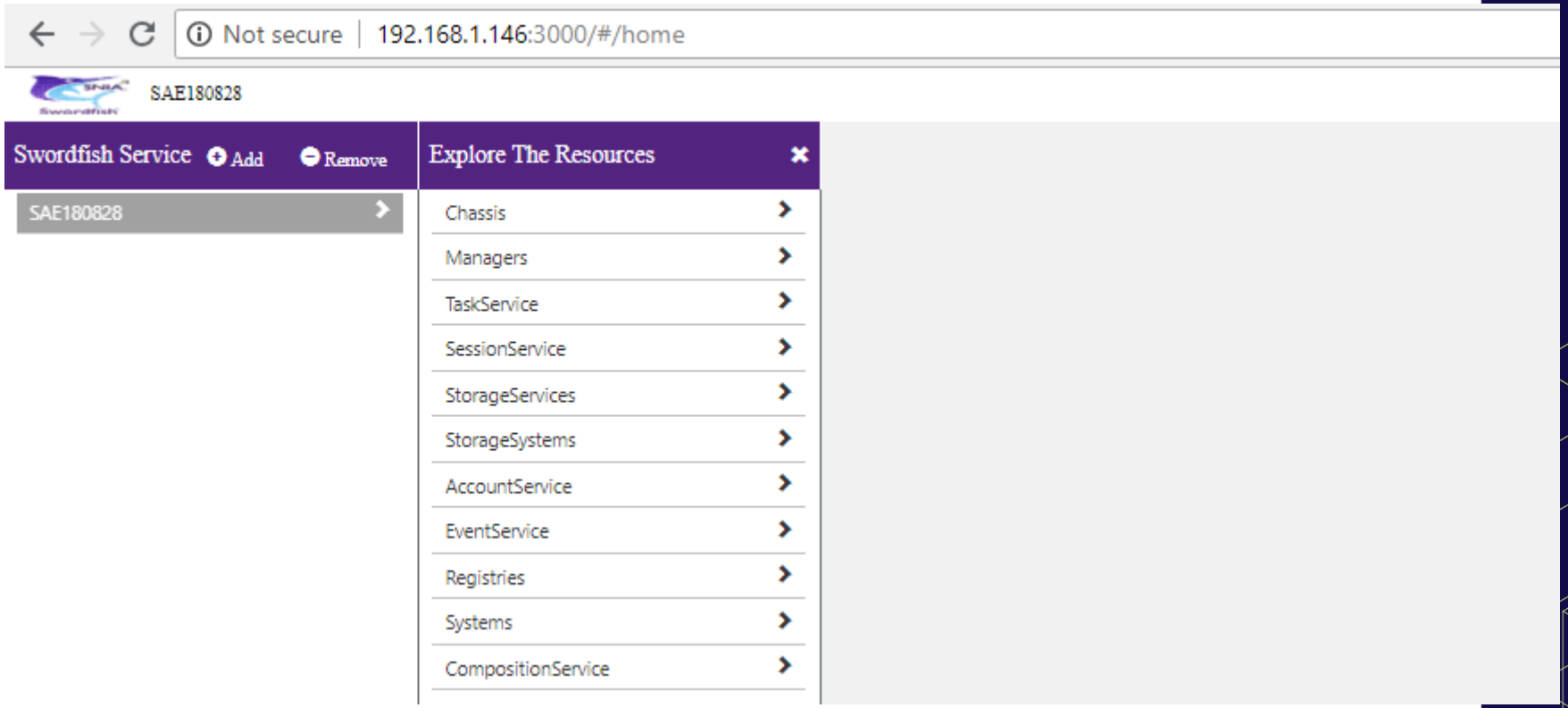
Swordfish Basic Web Client Screen Output (Service Root)



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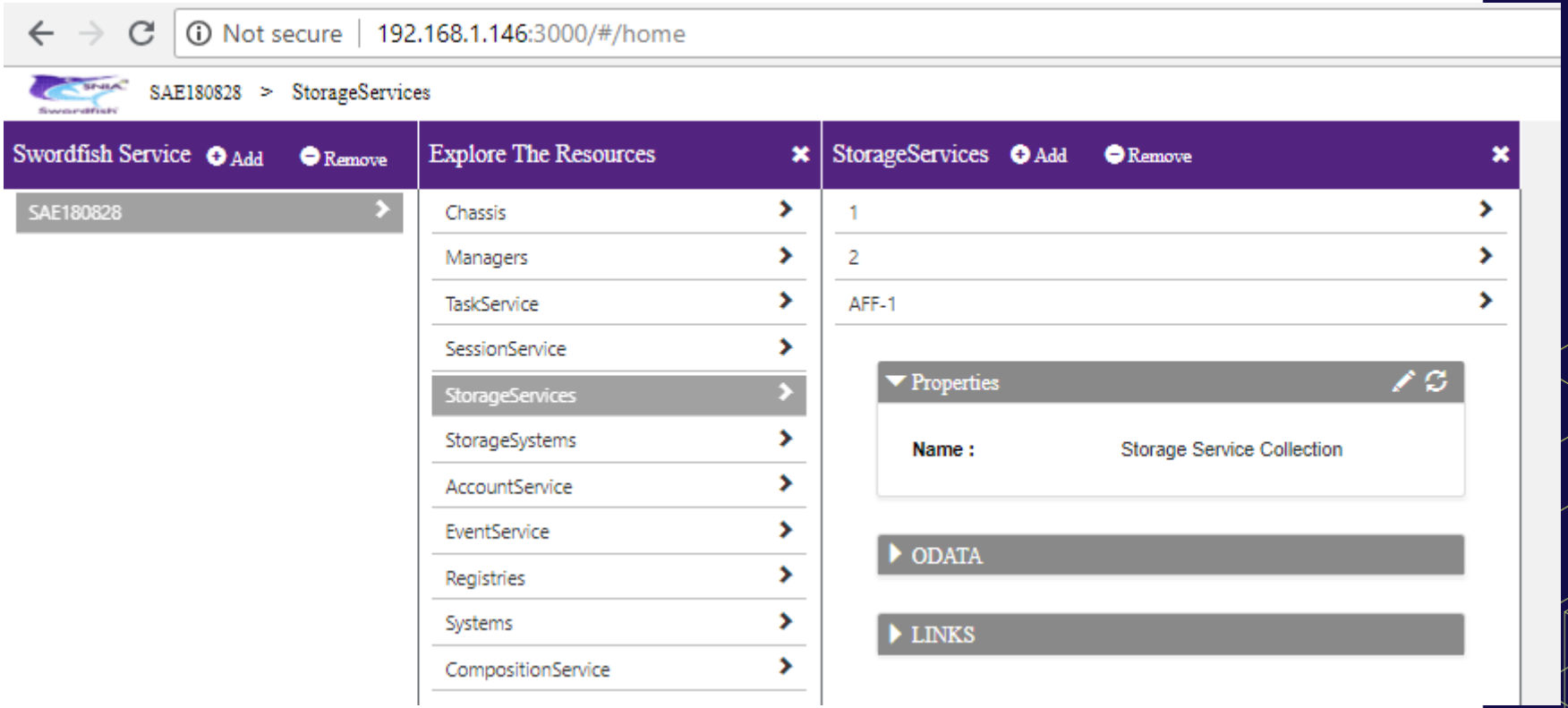
Swordfish Basic Web Client Screen Output (StorageServices)



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Swordfish Datadog Sample Dashboard Integration

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: https://github.com/SNIA/Swordfish-datadog-sample-dashboard-integration
- Includes installation, user, and developer documentation

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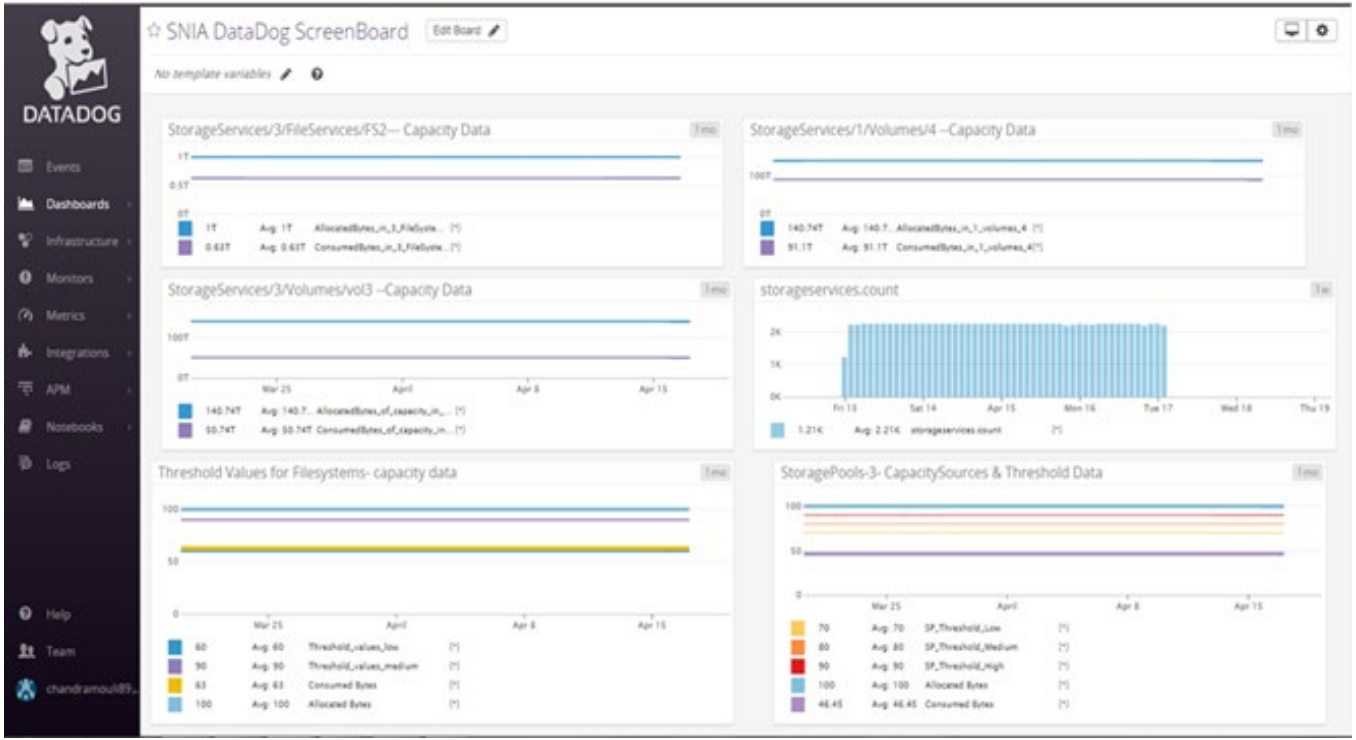
Swordfish Datadog Sample Dashboard Output



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Swordfish Power BI Sample Dashboard Integration

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: https://github.com/SNIA/Swordfish-powerBI-sample-dashboard-integration
- Includes installation, user, and developer documentation

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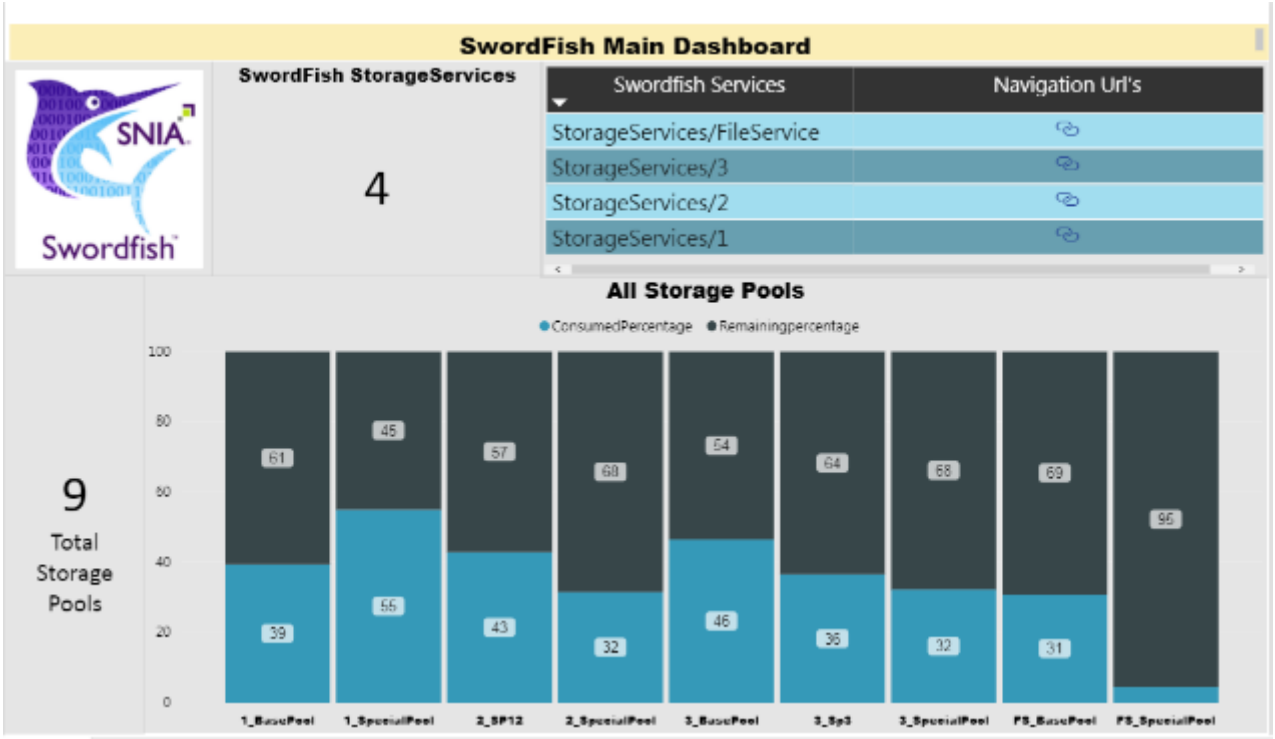
Swordfish Power BI Sample Dashboard (Main)



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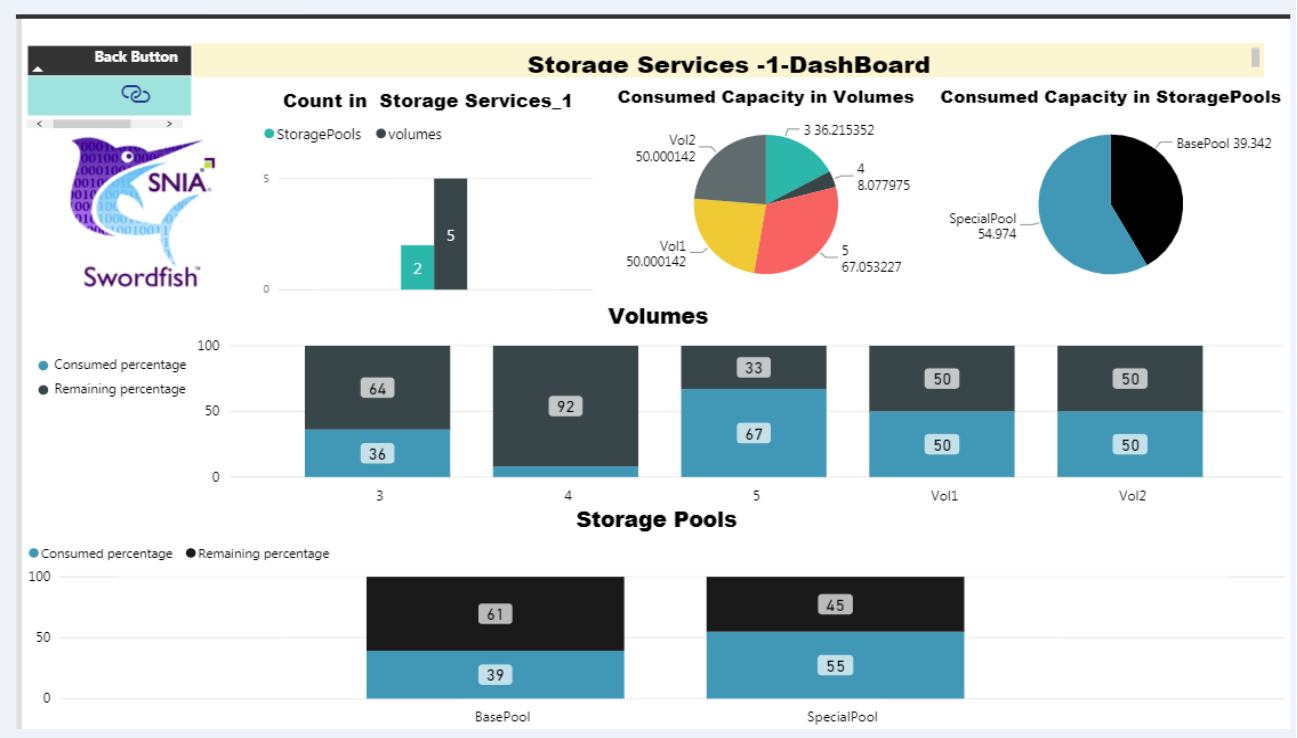
Swordfish Power BI Sample Dashboard (Child)



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More open source projects that can help developers work with Swordfish

Stay tuned for these talks today

- Accelerating Windows Integrations: Introducing the SNIA Swordfish™ PowerShell Tool Kit and Windows Admin Center Integration
  - Using PowerShell with Swordfish
  - Using Windows Admin Center with Swordfish

- Golang Support for SNIA Swordfish™
  - Using Go with Swordfish and Redfish

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Where to find more information

Swordfish and Redfish Standards Information

- Swordfish information on the public SNIA web site
  - Specs, Schema, Mockups, User's Guide, etc
  - Link: www.snia.org/swordfish
- Redfish information on the public DMTF web site
  - Specs, Schema, Mockups, Educational Material, etc.
  - Links: www.dmtf.org/redfish and https://redfish.dmtf.org
- Redfish (and Swordfish) Public Discussion Forum
  - Link: www.redfishforum.com (or www.swordfishforum.com)
  - Ask questions on this forum and get answers from experts

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Swordfish and Redfish Open Source Repositories

- Swordfish open source projects on GitHub
  - Link: https://github.com/SNIA
- Redfish open source projects on GitHub
  - Link: https://github.com/dmtf

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Contributing to SNIA Open Source Projects

- SNIA open source projects welcome input!
- Contributors who are not SNIA members need to agree to the terms of the SNIA Contributor License Agreement
  - Link: https://www.snia.org/CLA
- The SNIA Swordfish open source projects are covered by the terms of the BSD 3-clause License

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Thank You!

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