

**Looking for a Swiss knife for storage ecosystem management?
*A comparative study of SMI-S, Redfish and Swordfish***

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Agenda

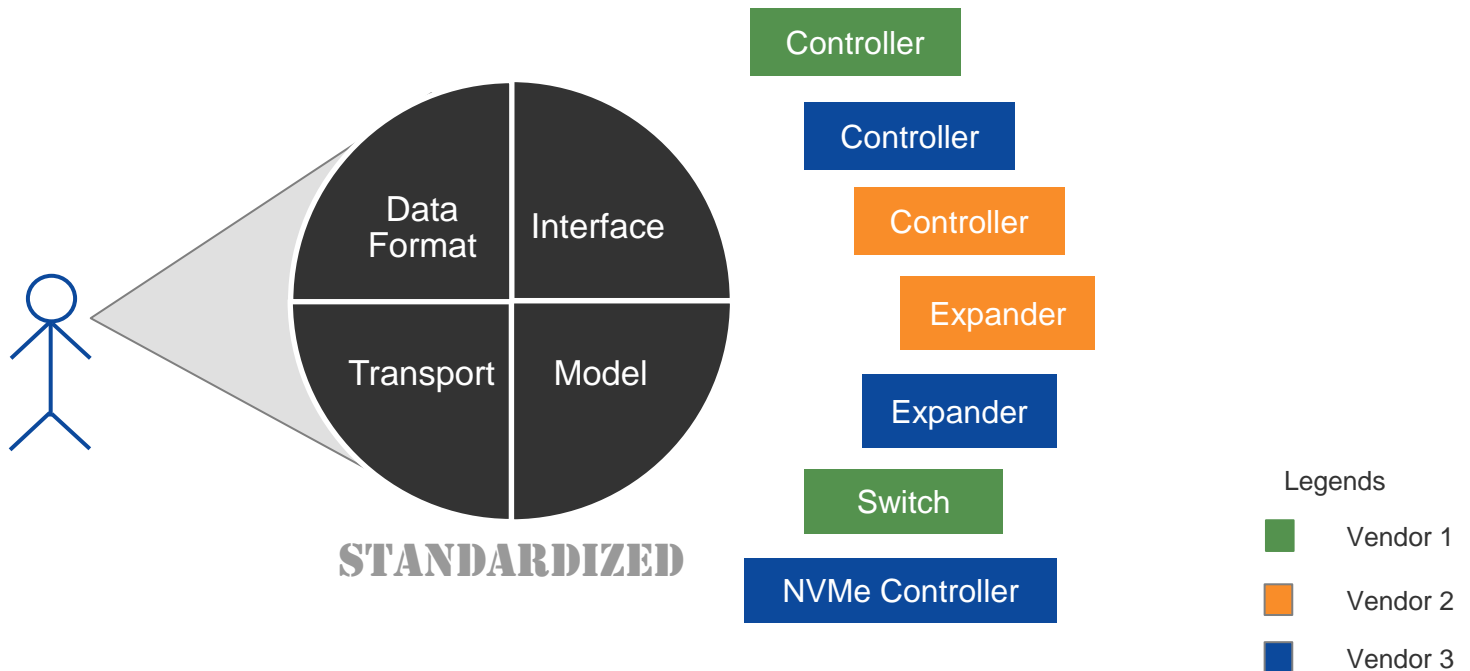
- Storage management standards
- Modelling ideology
- Modelling architecture
- Merits and demerits
- Standardization and customization

Why Standardize?

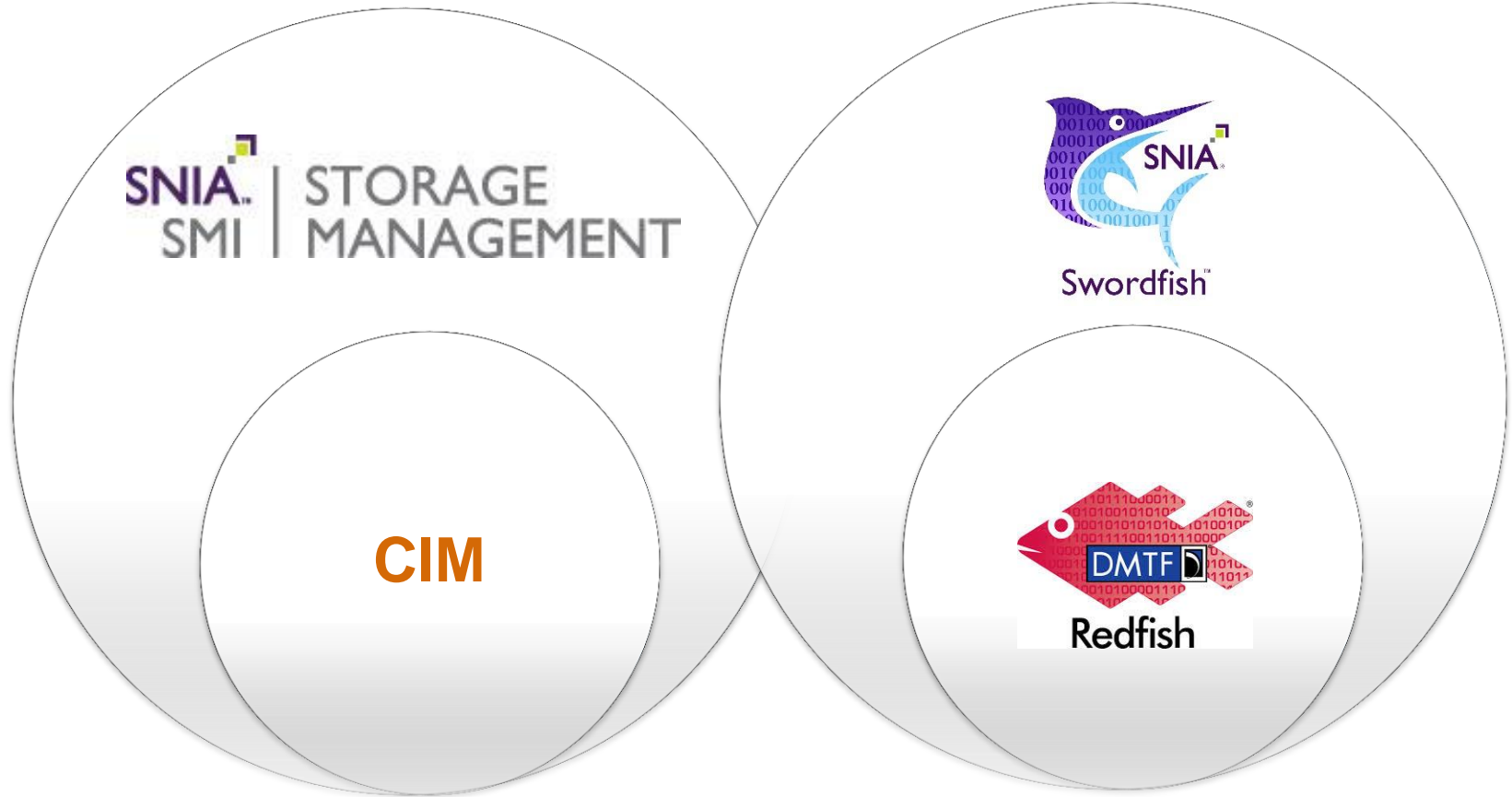
- Multiple components by different vendors in a server
- Different management interfaces
- Different data exchange formats
- Security is always a concern

Standardization

- Standard way of modelling all components of an IT environment
- Standard data format for representing attributes and events
- Standard interface for performing any operation
- Ease of programming, scripting, and human readability



Storage Management Standards



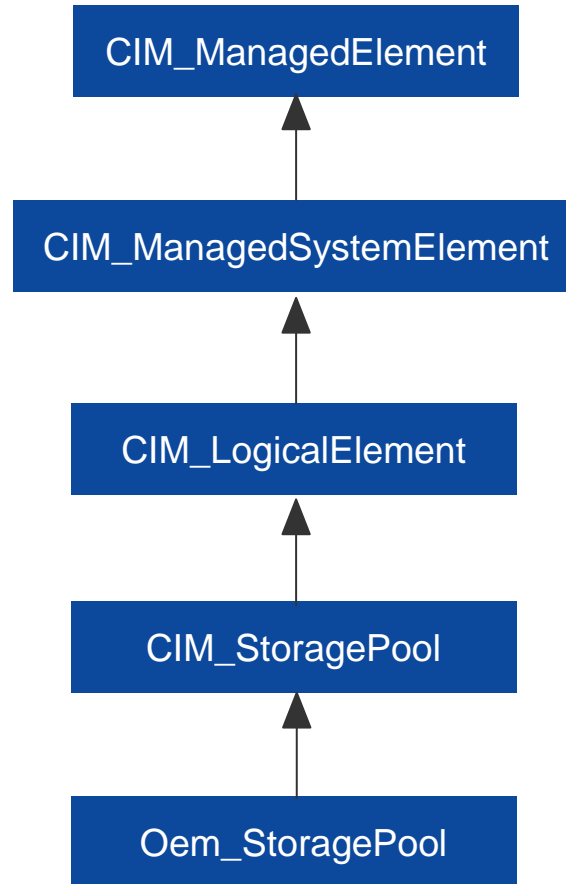
SMI-S

- The Storage Management Initiative Specification (SMI-S) from SNIA standardizes and streamlines storage management functions and features into a common set of tools
- Operations include identifying and modifying attributes of components, discovery, security, virtualization, performance, and fault reporting
- Manageability of both hardware and software components
- Based on the Common Information Model (CIM) of DMTF with the data format as CIM-XML
- Uses MOF syntax to describe classes.

SMI-S: Modelling Ideology

- Modelled on CIM, which is an object-oriented model
- Managed elements are represented as CIM classes that include properties and methods to represent management data and functions
- The CIM schema is an implementation of CIM to model various classes needed in an IT environment such as computer systems, networking, applications, storage, and more
- Users can extend the CIM schema by inheriting and extending existing classes to better describe their component

SMI-S: Modelling Architecture



SMI-S: Advantages and Disadvantages

■ Advantages

- Evolved and stable standard
- Independence from platform, programming language, and compiler
- Clients available in all frequently used programming languages
- Reliability, security, and better quality of product
- Products from multiple vendors can be treated in the same way
- Preferred standard in virtualization
- Improved time to market

■ Disadvantages

- Numerous levels of inheritance and association classes
- Data parsing needed because of XML data format

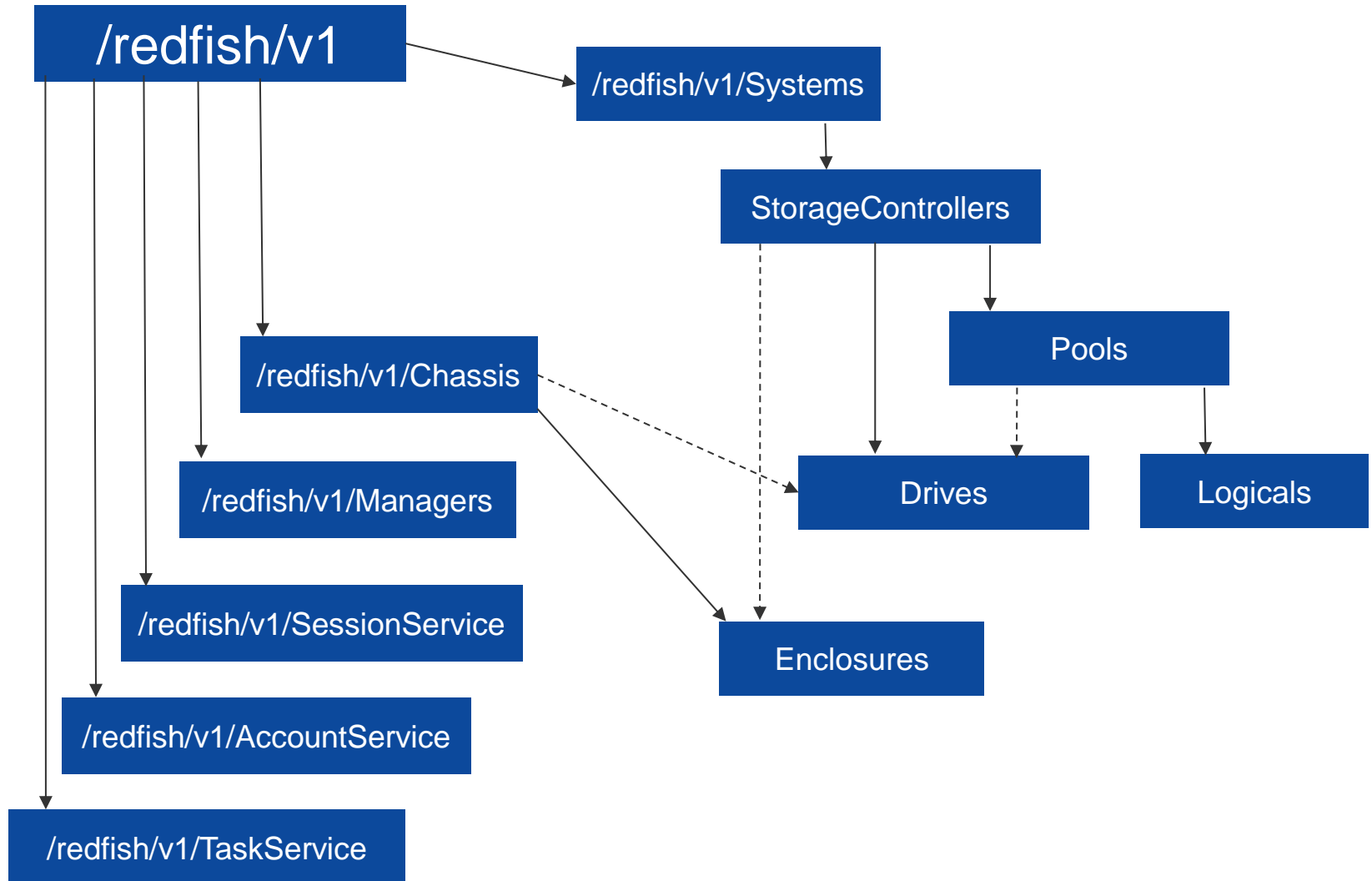
Redfish

- DMTF's Redfish is an open standard specification and schema for simple and secure management of modern scalable platform hardware
- Specifies a RESTful interface, uses HTTPS as the transport protocol, and utilizes JSON and OData as the data format
- Provides ways to manage resources, discovery, authentication, authorization, event reporting, and task handling

Redfish: Modelling Ideology

- Everything is a self-contained resource with no inheritance or polymorphism
- Resources are linked from the service entry point/redfish/v1
- Major homogeneous resource types are structured together to represent collections
- Resources are broadly classified under one of the three views:
 - Logical or data view—resources grouped under Systems
 - Physical view—resources grouped under Chassis
 - Management view—resources grouped under Manager
- Reduces traffic

Redfish: Modelling Architecture



Redfish: Advantages and Disadvantages

■ Advantages

- Out-of-band management through MCTP
- In-band management through device driver
- JSON OData format and flat resource schema
- Applications will be abstracted from communication path as long there is an HTTPs server
- Client-based data representation
- Well-defined schema, including OEM extensions, foster extensibility
- Improved time to market

■ Disadvantages

- Storage management modelling needs better handling
- Newer standard that requires better adoption

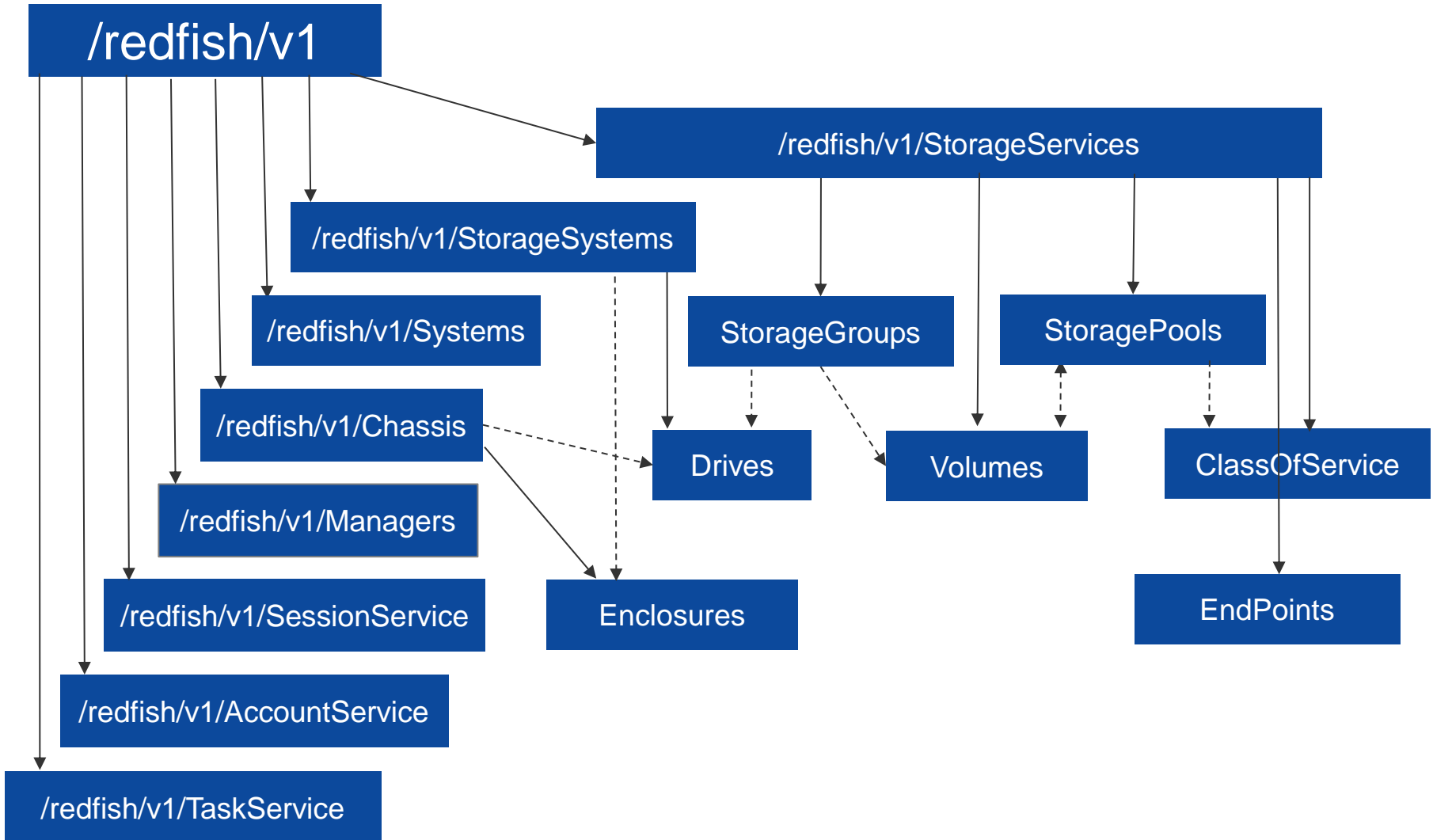
Swordfish

- The SNIA Swordfish specification helps to provide a unified approach for the management of storage and servers in hyperscale and cloud infrastructure environments
- Extends DMTF Redfish specification and leverages all the services and data formats specified by Redfish
- Seamlessly manages storage equipment and storage services in addition to server
- Provides functionality that simplifies the way storage is allocated, monitored, and managed

Swordfish: Modelling Ideology

- Leverages and extends DMTF Redfish specification
- Refactors and leverages SMI-S schema into a simplified client- oriented model
- Provides class of service-based provisioning and monitoring
- Covers block, file, and object storage
- Extends traditional storage to include converged environment

Swordfish: Modelling Architecture



Swordfish: Advantages and Disadvantages

- Advantages
 - All the advantages of Redfish are applicable
 - Class of service-based storage/resource provisioning and monitoring
 - Converged IT environment and traditional storage domain support
 - Power of SMI-S in a simplified client-friendly format

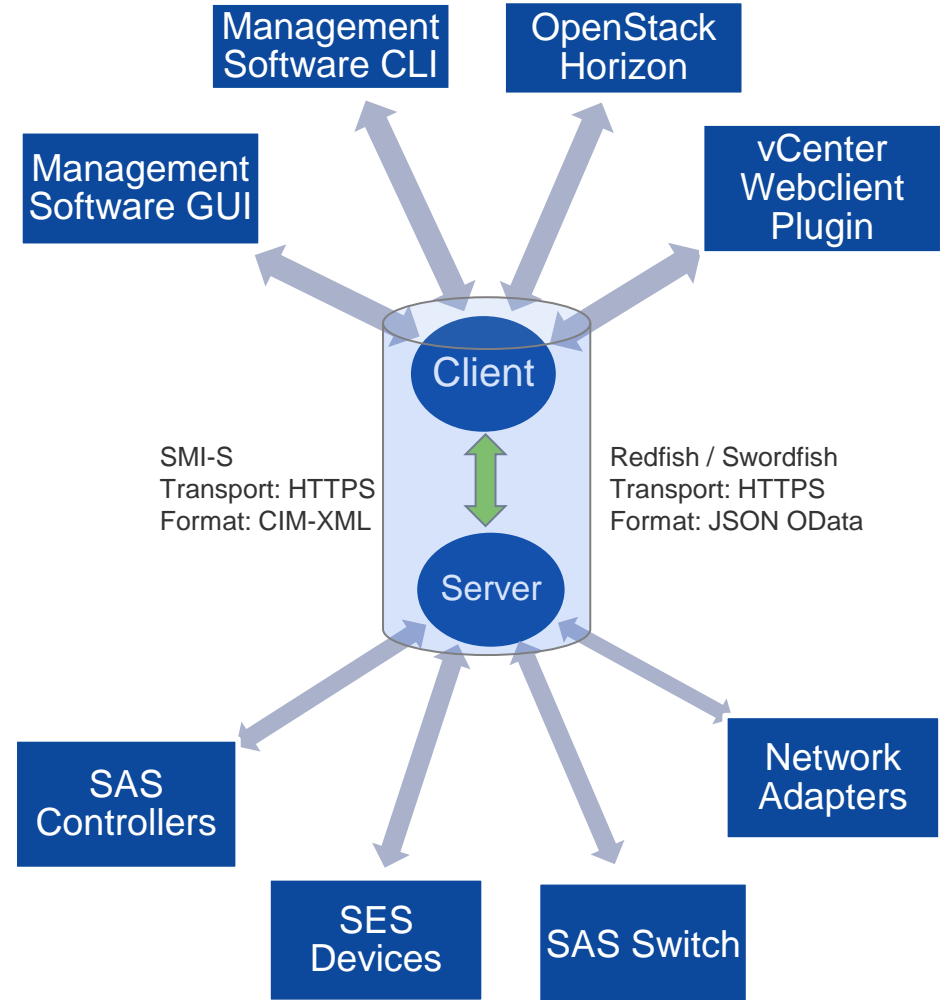
- Disadvantages
 - Newer standard that requires better adoption

What Have We Done?

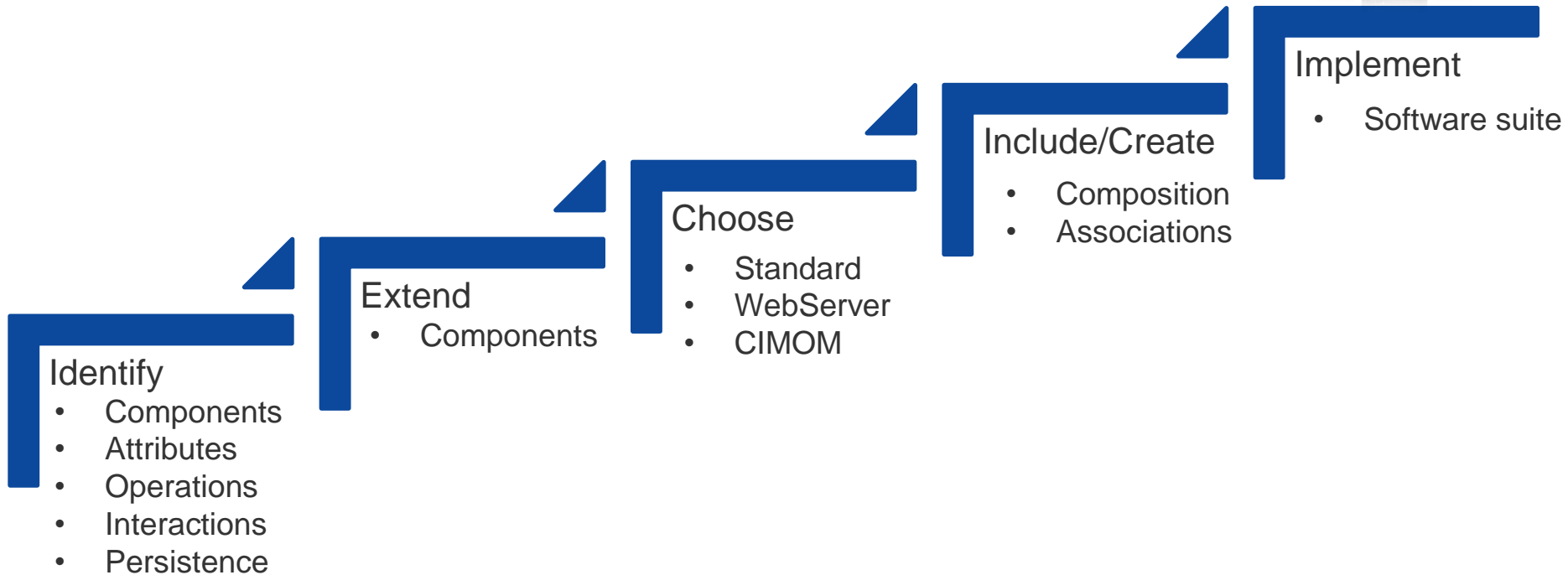
- Redfish-based client and server framework to manage different families of Microsemi storage controllers in a direct attach storage configuration
- Integration of Redfish client-server framework with OpenStack Horizon and our storage management GUI
- Redfish-based server plugins to seamlessly manage different Microsemi products
- SMI-S provider for managing Microsemi storage controllers
- Integration of SMI-S provider with our management GUI and vSphere web client plugin

Storage Ecosystem Management Solution

- Customize applications to suit diverse end-user needs
- Thinner clients with better user design
- Standardized common communication path, model, and data format
- Customize component data by extending standard schema



Migrating Existing Systems to Newer Standards



Food for Thought

Convergence of diverse component management of a system

User-focused interface providing most relevant information

Automated error notification, handling, and correction

API driven design

Self-learning component management

References

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- https://www.snia.org/forums/smi/tech_programs/smis_home
- <https://www.snia.org/forums/smi/swordfish>
- <http://www.dmtf.org/standards/cim>

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