SNIA ESF | ETHERNET STORAGE

EVERYTHING YOU WANTED TO KNOW ABOUT STORAGE, BUT WERE TOO PROUD TO ASK

Part Cyan

Storage Management

September 28, 2017
10:00 am PT

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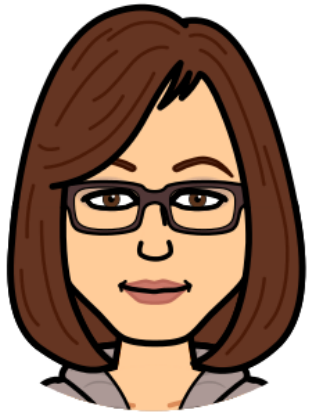
Today's Presenters

J Metz
Cisco

Alex McDonald
NetApp

Mark Rogov
Dell EMC



Richelle Ahlvers
Broadcom

SNIA-at-a-Glance

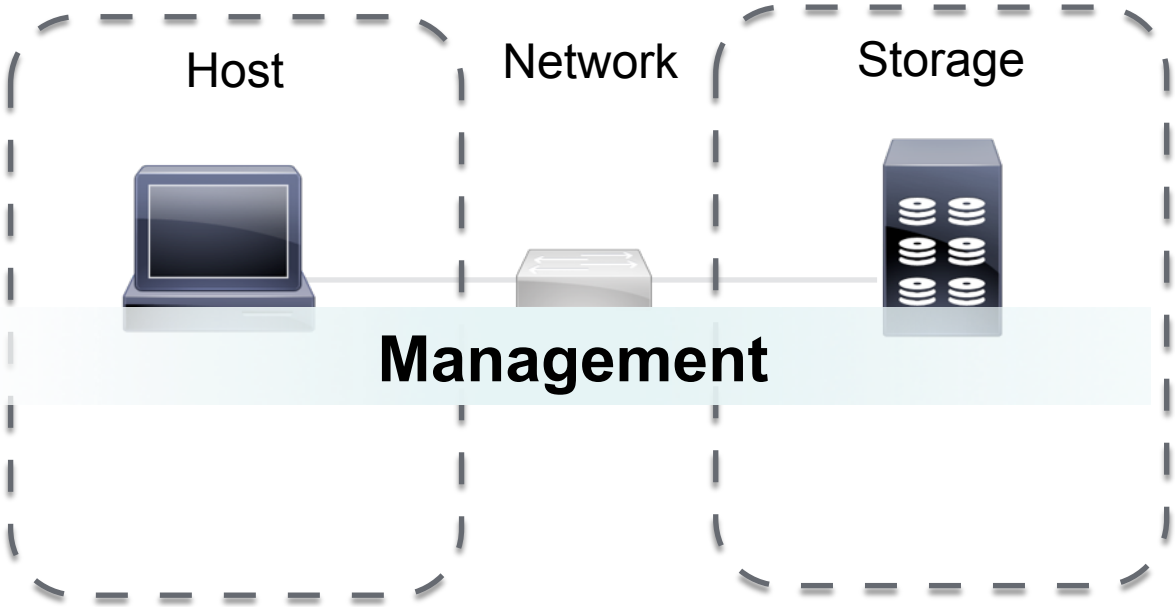
160
unique member companies

2,500
active contributing members

50,000
IT end users & storage pros worldwide

Agenda

- Management Processes
  - Discovery, Provisioning, Configuration
- Software-Defined Storage
- Storage Management
- Why Do We Have Storage Management Standards
  - SMI-S
  - Swordfish



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Discovery, Provisioning, Configuration

Mark Rogov / Dell EMC

Management Use Cases

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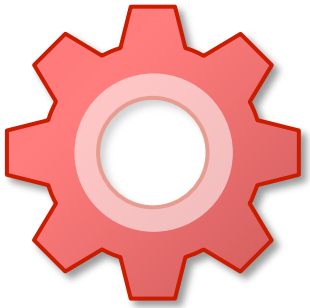
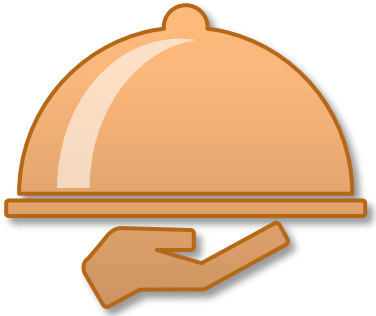
CONFIGURATION



CREATE STORAGE COMPONENTS AND SERVICES

PROVISIONING

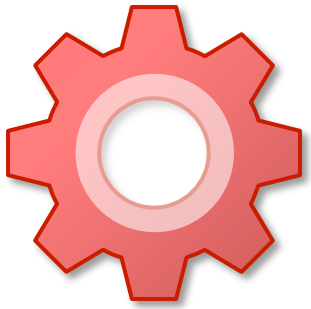


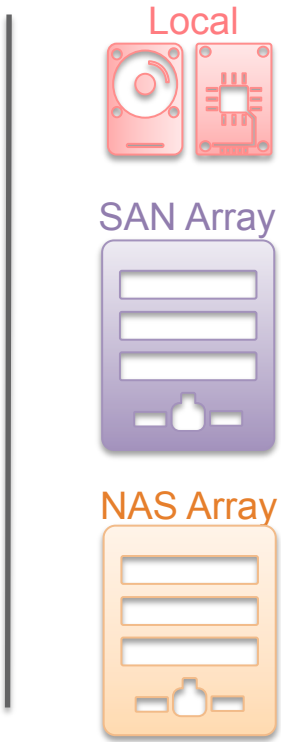
PROVIDE STORAGE COMPONENTS AND SERVICES TO CUSTOMERS

DISCOVERY

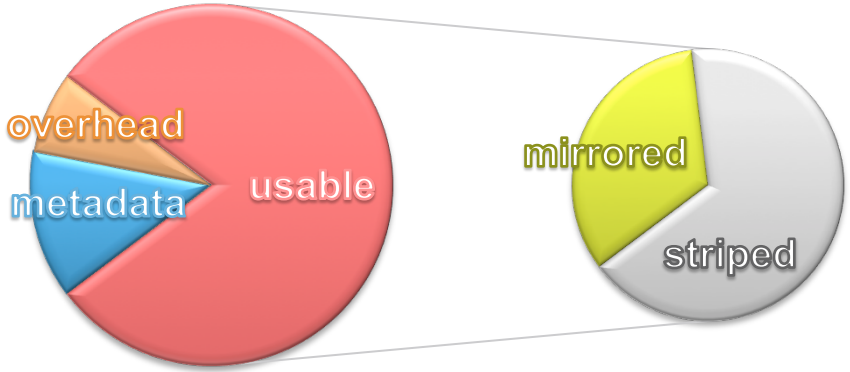
FIND STORAGE COMPONENTS AND COLLECT INFORMATION ABOUT THEM

Configuration

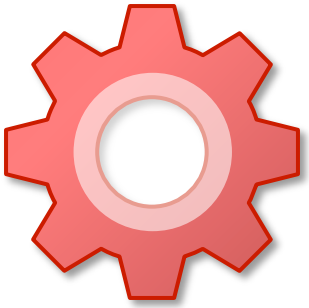




WHAT IS USABLE STORAGE? WHY?



Configuration



OTHER SERVICES TO CONFIGURE?

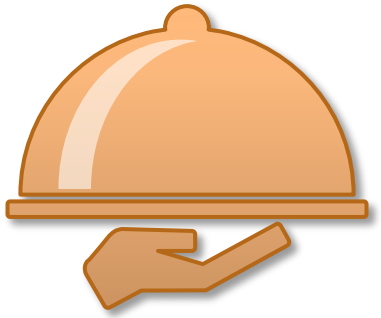
Performance

Backup

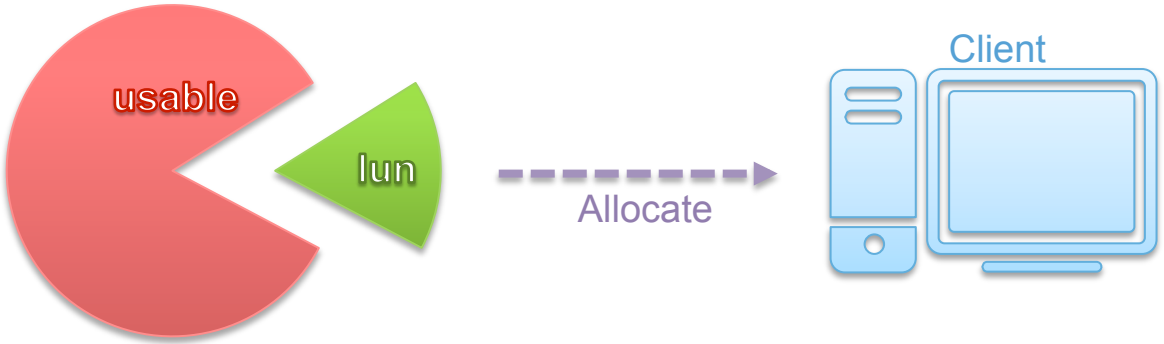
Security

Logs

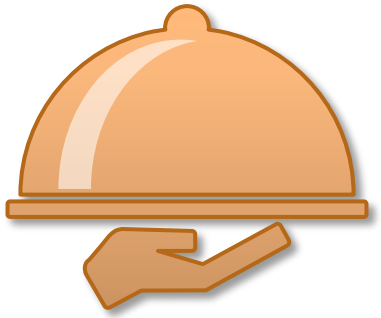
Provisioning



HOW MUCH CAPACITY DO I GET?



Provisioning



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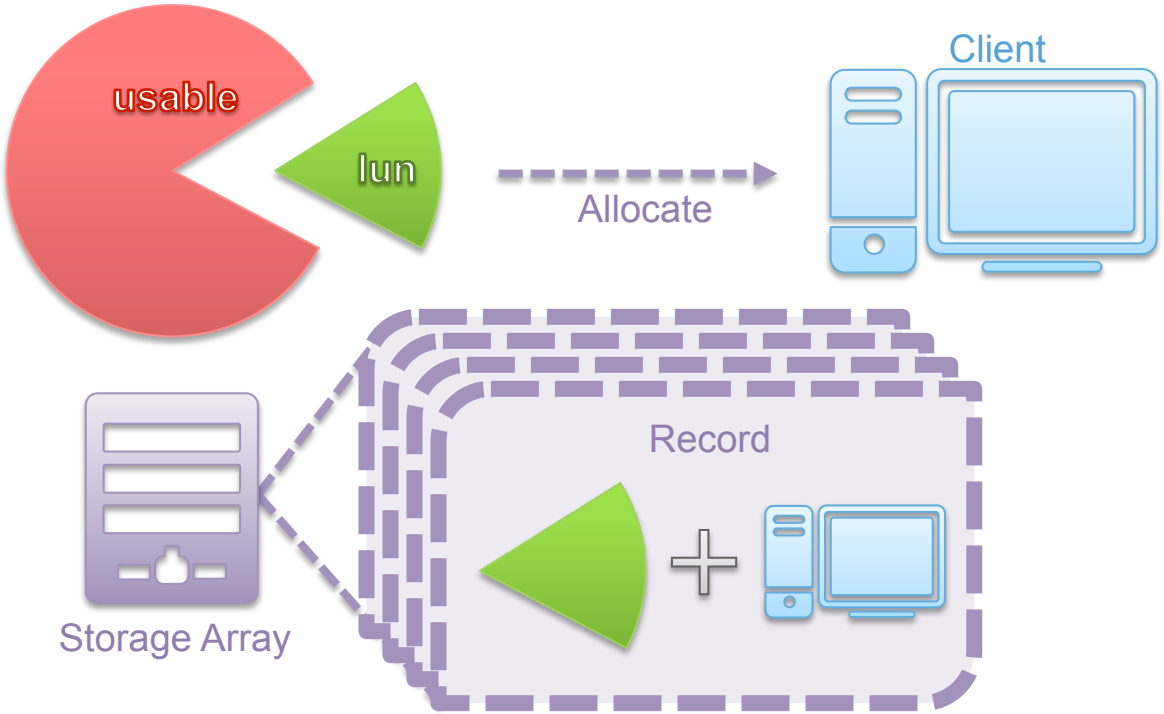
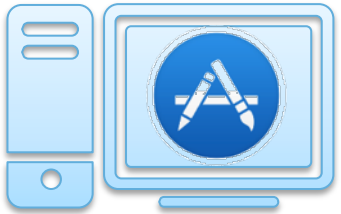


Discovery

WHICH STORAGE? WHERE IS IT?

Application



Database

Object Storage

Discovery

WHICH STORAGE? WHERE IS IT?

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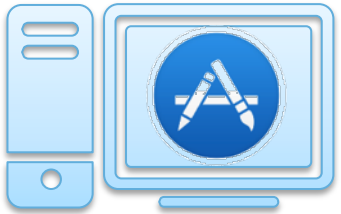

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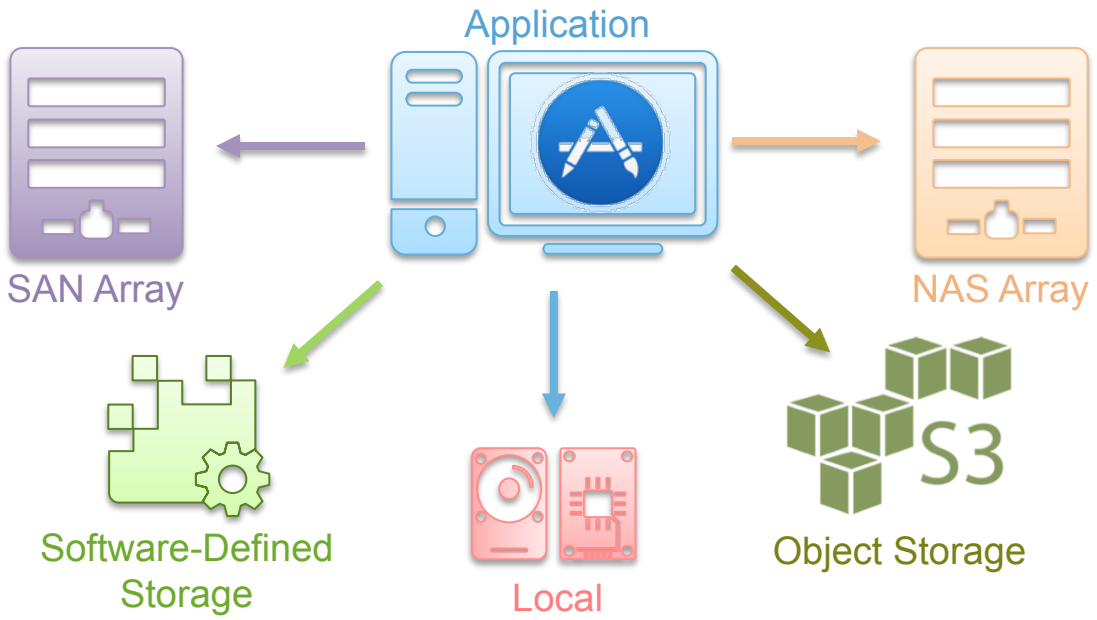
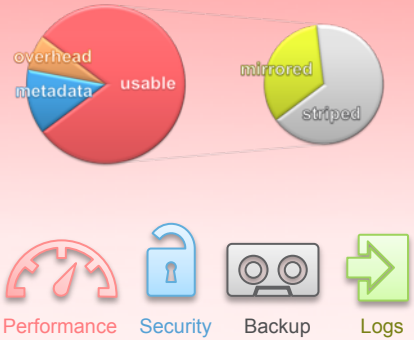


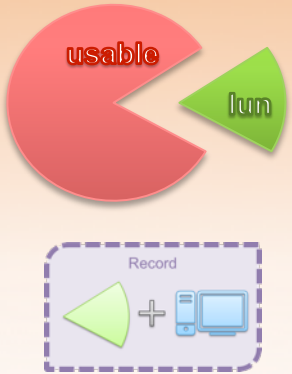
Summary

CONFIGURATION



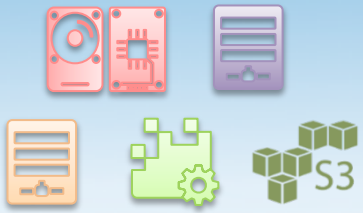
CREATE STORAGE COMPONENTS AND SERVICES

PROVISIONING



PROVIDE STORAGE COMPONENTS AND SERVICES TO CUSTOMERS

DISCOVERY



FIND STORAGE COMPONENTS AND COLLECT INFORMATION ABOUT THEM

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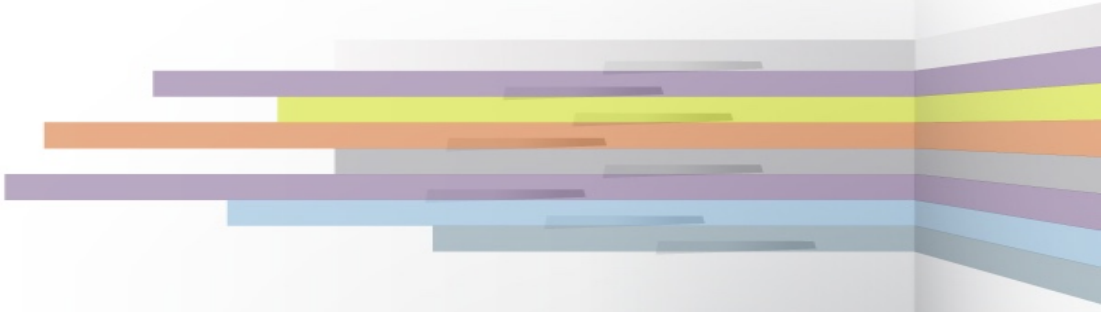
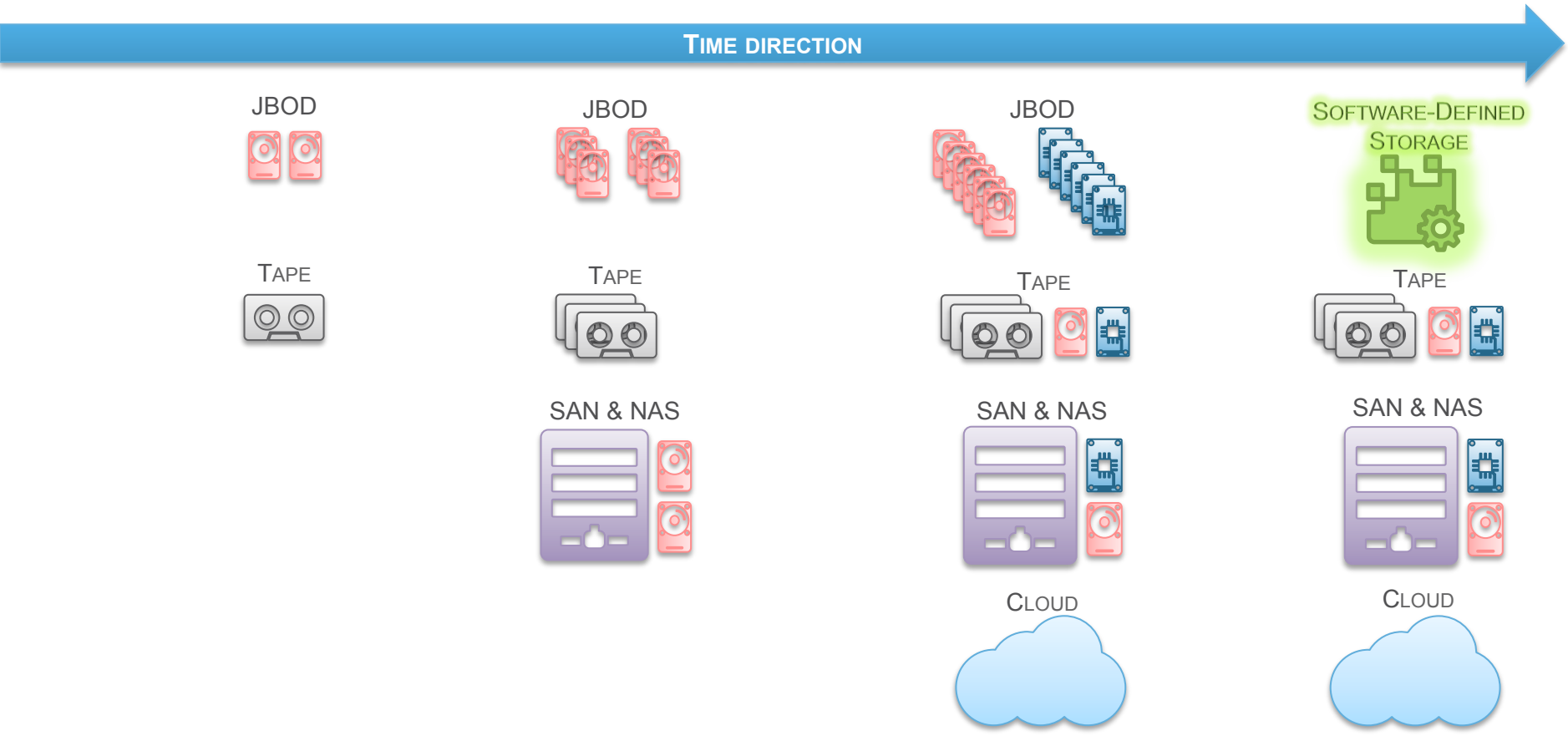


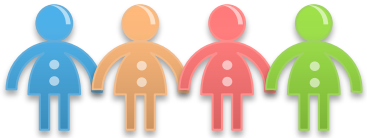
Software-Defined Storage

History & Software-Defined Storage

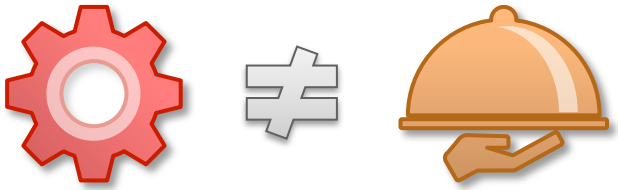


Software-Defined Storage

VIRTUALIZED STORAGE WITH A SERVICE MANAGEMENT INTERFACE



Commodity or Specialized Hardware



Management (Control Plane) is separate from Data (Data Plane)

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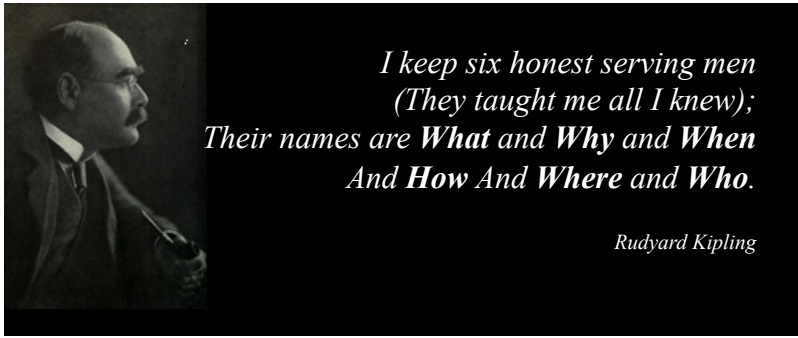
Storage Management

Alex McDonald/ NetApp

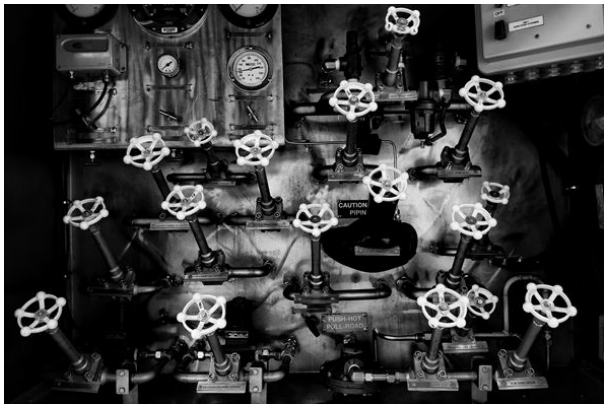
Storage Management

- "If you can't measure it, you can't manage it"
- Storage management
  - Shares in common a set of IT management philosophies
  - Requires data & analysis tools
    - Open, Proprietary, Roll your own
- Knowledge required ("Kipling's Servants"):
  - Drivers of resource consumption
  - Relationship between drivers and the resource
  - Time & Cost are the keys



Storage Management

- We have a tendency to
  - Measure things with a micrometer
  - Mark them with a crayon
  - Hit them with an ax
- Priorities
  - “What’s required?” first
  - “With what tools?” last
- Too many knobs and too many gauges
  - What is connected to what an issue
  - Ideally: 1 knob, 1 gauge
  - Often: N knobs, M gauges, lots of twiddling & fiddling
  - Not everything is in-house & readily measurable; e.g. cloud; hybrid, public, burst
- Vendors are an excellent source of information
  - Many have capacity & sizing tools that are very sophisticated and you’ve already paid for them



Example: BookABunk.com

- Low cost bunkroom booking company
- 3 primary apps;
  - Bunks webapp with pictures & details
  - Booking backend
  - Client frontend
- Several secondary apps
  - Internal help systems etc

- Drivers & Metrics
  - Private vs hybrid vs public cloud usage
  - Static usage
    - Space, cost, transmission, recovery
  - Dynamic usage
    - Transactions, peaks, response (latency & bandwidth), users
  - Business demands
    - Growth, decline, market changes
    - Security, data protection, privacy

Storage Management Summary

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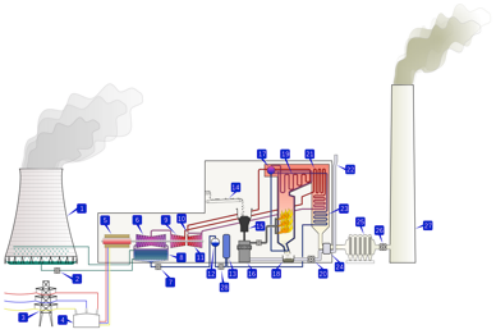
- Goals & Objectives
  - Growth vs costs
  - Link in with other management processes
  - Essence is Time & Cost
- Drivers & Resources
  - Relevance; what should I measure?
    - Cost and point of measurement
    - Impact on decisions by this measurement



- Typical Drivers
  - Business changes & growth
  - Application storage use
  - Transactions, files, objects per period
  - “Class of Service” required
- Resources
  - Capacity
  - Performance (latency & bandwidth)
  - Communal or dedicated
  - Private, cloud or hybrid
  - Money (ie how much does it cost)
- Select tools that support entire IT enterprise
  - Favour integration; don’t be dazzled by GUIs
  - Favour simplicity; fewer knobs and dials
  - Favour automation; better than human intervention
  - Favour information; data is nice, but has no meaning without interpretation

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What Are Storage Management Standards and Why Do We Have Them?

Richelle Ahlvers/Broadcom Limited

Why Have Storage Management Standards?

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Problems:

- Customers and clients had/have too many vendor-specific ways to access the same / similar data from different (or even the same!) devices.
- Different ways to access each one
- Spending too much time and effort trying to access management information across their environments
- Vendors also spending too much time supporting multiple ways to access data

What did the industry do to address?

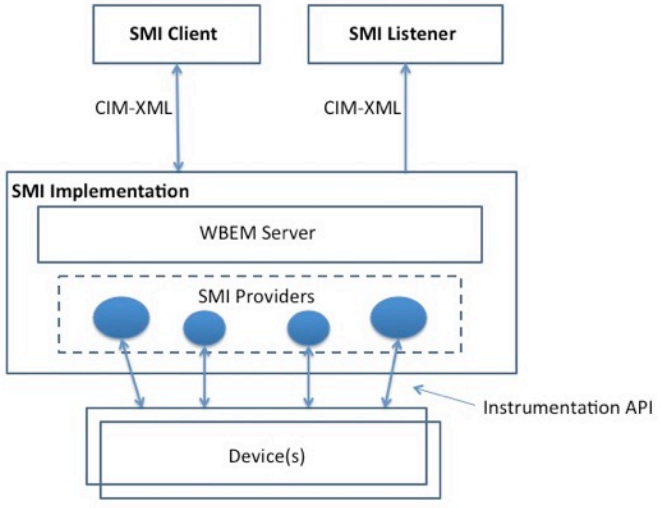
- Storage companies got together to agree how to represent storage systems programmatically via a common API (Application Programming Interface)

What else did they do?

- They agreed to use a common set of terms, a common set of standard functionality, and a way to let storage vendors add their unique features (in a common way)

Legacy Standards: SMI-S

- Established, broad industry support across traditional storage vendors:
  - External storage arrays
  - Tape and backup
- Storage vendor driven
- SMI-S Interface (CIM-XML)
  - HTTP/HTTPS - protocol
  - CIM-XML - format of content



What are the Drivers for Updates?

- 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

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- **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

snia.org/swordfish

The Swordfish Standard

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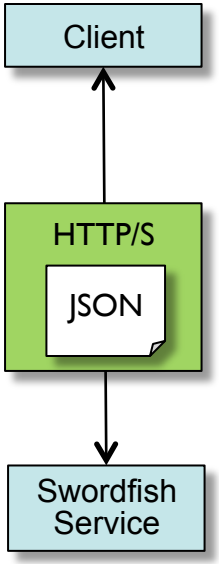
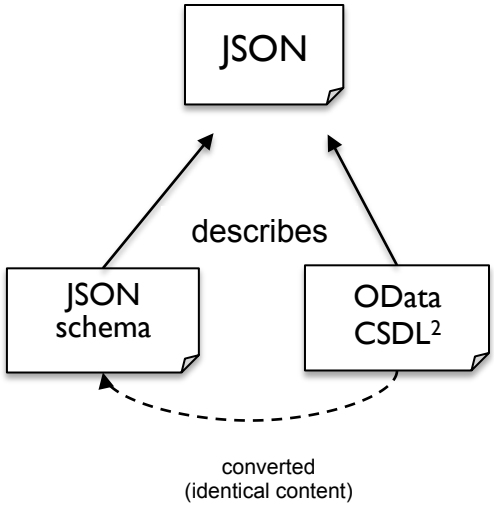
- Swordfish is composed of:
  - Interface definition
  - Model schema
- Swordfish Interface (RESTful)
  - HTTP/HTTPS - protocol
  - JSON – format of content
- Swordfish Models and Schema
  - Schema format for JSON
  - DMTF publishes the models for platforms and compute/servers
  - SNIA publishes the models for storage





SNIA Swordfish™

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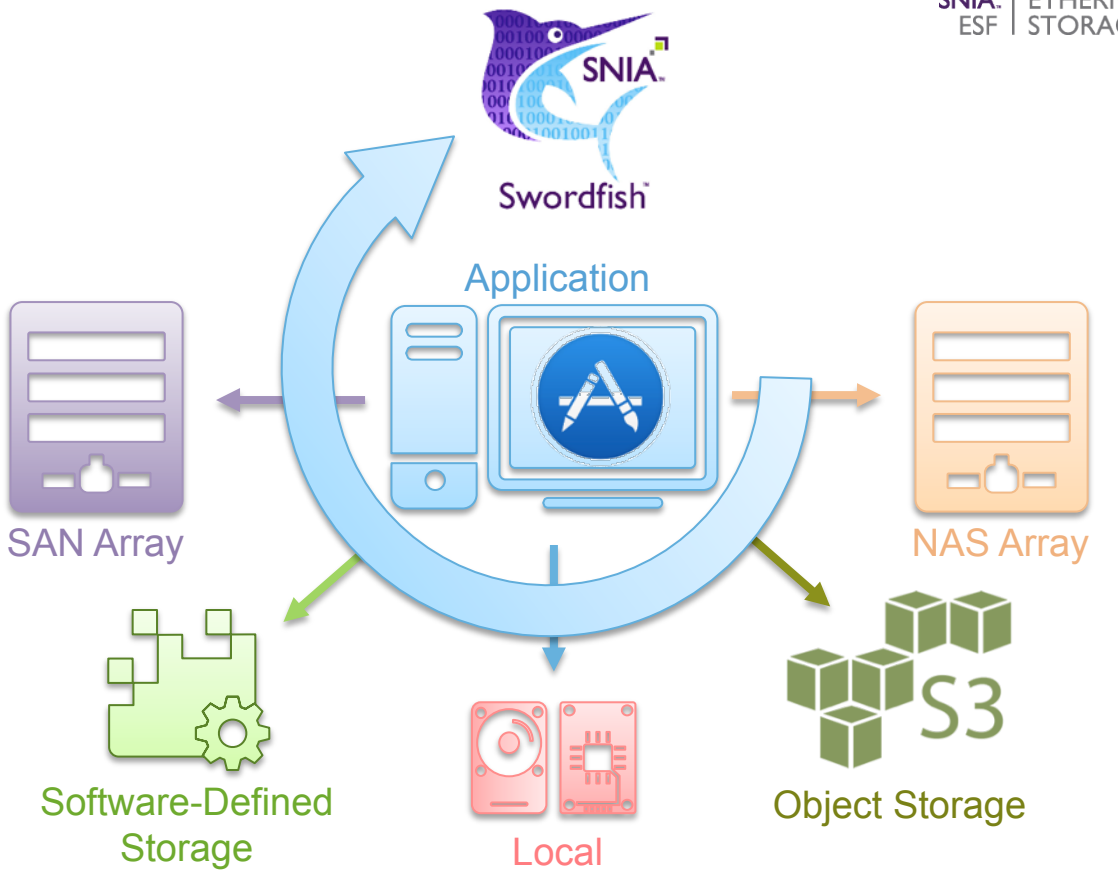

Summary

- Devil in the Details
  - Many moving parts, and can get mired in the “tweaking quagmire"
- Management covers:
  - Control Plane
  - Data Plane
  - Discovery
  - Configuration
- Standardization
  - Allows for greater interoperability
  - Broadly adopted SMI-S covers many different storage types
  - New Swordfish Standard address modern data structures and models

Other Storage Terms Got Your Pride? This is a Series! Check Out:

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- **Teal** – Buffers, Queues and Caches https://www.brighttalk.com/webcast/663/241275
- **Rosé** - All things iSCSI https://www.brighttalk.com/webcast/663/244049
- **Chartreuse** – The Basics: Initiator, Target, Storage Controller, RAID, Volume Manager and more https://www.brighttalk.com/webcast/663/215131
- **Mauve** – Architecture: Channel vs. Bus, Control Plane vs. Data Plane, Fabric vs. Network https://www.brighttalk.com/webcast/663/225777
- **Sepia** – Getting from Here to There https://www.brighttalk.com/webcast/663/249431
- **Vermillion** – What if Programming and Networking Had a Storage **Baby?** https://www.brighttalk.com/webcast/663/260321
- **Turquoise** – Where Does My Data Go? https://www.brighttalk.com/webcast/663/267327

Speaking of Series…Check out Storage Performance Benchmarking

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- Storage Performance Benchmarking:
  1. Introduction and Fundamentals
  2. Solution under Test
  3. Block Components
  4. File Components

Watch them all on-demand at:
http://www.snia.org/forums/esf/knowledge/webcasts-topics

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- A full Q&A from this webcast, including answers to questions we couldn't get to today, will be posted to the SNIA-ESF blog: sniaesfblog.org
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