



# DMTF Overview

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# DMTF – An Industry Standards Organization

## WHO

Led by innovative, industry-leading companies, DMTF has a global presence with members in multiple countries.

## WHAT

DMTF standards support diverse emerging and traditional IT infrastructures including cloud, virtualization, network, servers and storage. A complete list is available at [www.dmtf.org/standards](http://www.dmtf.org/standards).

## WHY

Nationally and internationally recognized by ANSI and ISO, DMTF standards enable a **more integrated and cost-effective approach to management through interoperable solutions.**

## HOW

Simultaneous development of Open Source and Open Standards is made possible by DMTF, which has the support, tools and infrastructure for efficient development and collaboration.



## DMTF Board Member Companies

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# DMTF - International Standards Leader

## DMTF continues to grow its global presence

- DMTF has a global presence with members in multiple countries
- Members on:
  - ✓ ISO JTC1/SC 38 representation
  - ✓ ISO PAS submitter (only one of nine organizations in the world)

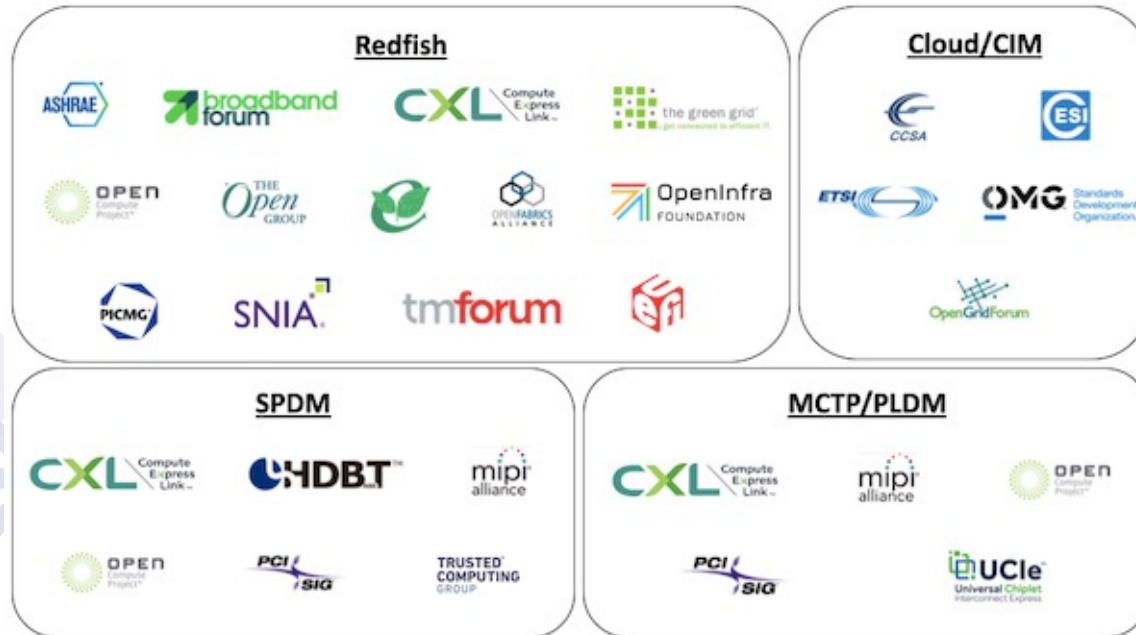
## Open and Collaborative

- Industry input on standards welcome via the DMTF Feedback Portal
- Open source development enabled within GitHub - DMTF invites review and contributions to its tools in public GitHub repositories
- Standards adopted by open source projects, including Java WBEM Services, Open Linux Management Infrastructure (OpenLMI), Open Management Interface (OMI), OpenBMC, OpenDRIM, OpenPegasus, OpenStack Ceilometer, OpenStack Ironic, Small Footprint CIM Broker (SFCB), and more



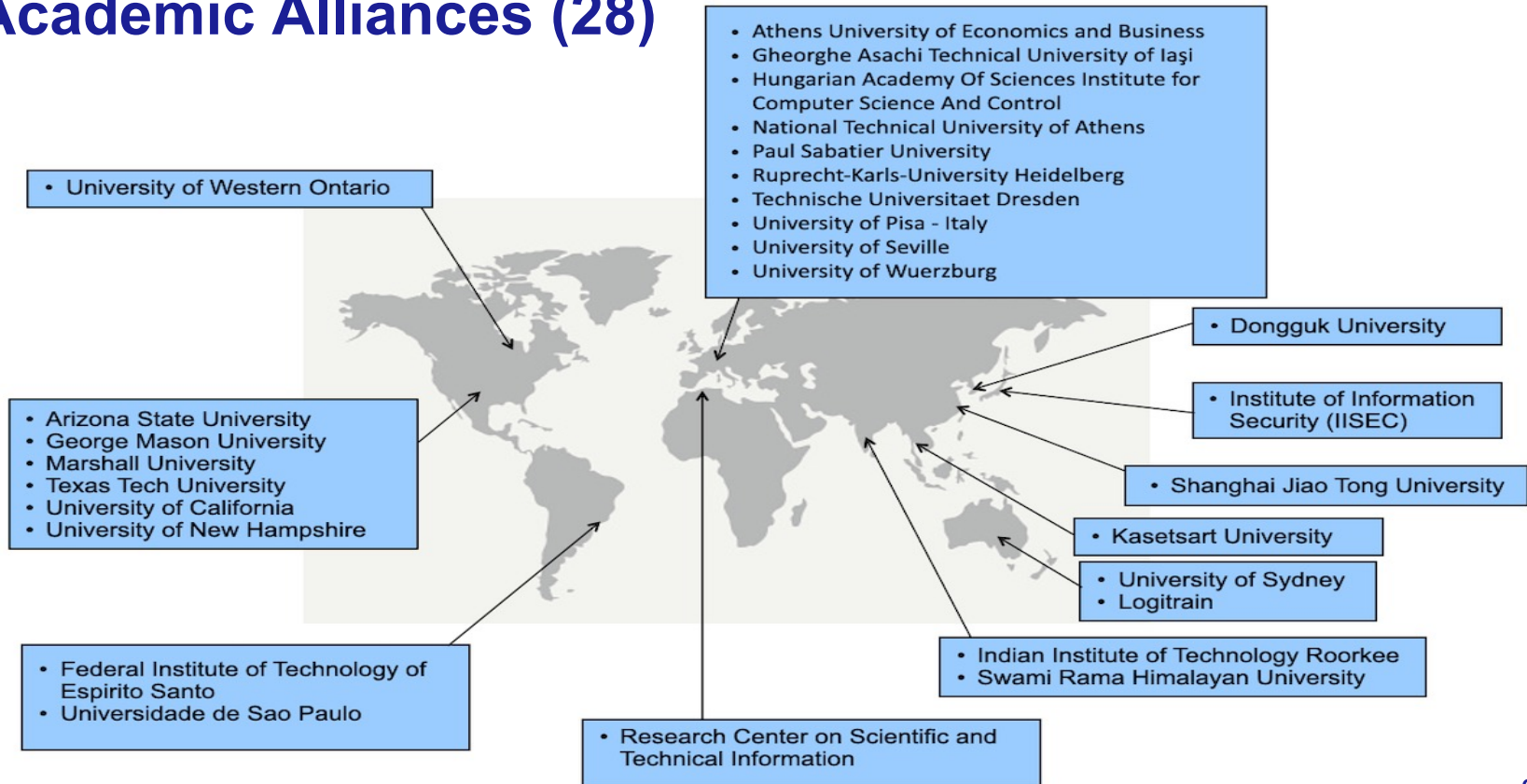
# DMTF Alliance Partnership

DMTF and its Alliance Partners develop a common dialogue and work together for the good of the industry, avoiding overlap and helping ensure interoperability. Current work registers can be found here - <https://www.dmtf.org/about/registers>





## Academic Alliances (28)



## Efficient and Agile

- DMTF has the support, tools and infrastructure for efficient and cost-effective development and collaboration of open standards and open source
- Alignment across all aspects of the organization increases efficiencies and overall agility – process overhead is the lowest of any recognized standards body, second to none
- Well-established IP policies and a streamlined approval process for specifications minimizes time to market and promotes early adoption
  - With administrative support and other resources necessary to operate and promote new standards, DMTF's portals for Technology Submission and Community Publication simplify the submission and sharing processes



# DMTF Standards and Technologies

- Formed in 1992, DMTF creates open manageability standards spanning diverse emerging and traditional IT infrastructures including cloud, virtualization, network, servers and storage
- Evolved from desktop management to web-based data center management

## Active Standards

**CADF** - Cloud Auditing Data Federation – 2011

**CIMI** - Cloud Infrastructure Management Interface – 2012

**CIM** - Common Information Model – 1996

**DASH** - Desktop & Mobile Architecture for System Hardware – 2006

**MCTP** - Management Component Transport Protocol – 2009 - Including NVMe-MI™, I2C/SMBus and PCIe® Bindings – 2010

**NC-SI** - Network Controller Sideband Interface – 2010

**OVF** - Open Virtualization Format – 2008

**PLDM** - Platform Level Data Model – 2009 - Including Firmware Update, Redfish Device Enablement (RDE)

**Redfish®** – Including Protocols, Schema, Host Interface, Profiles – 2015

**SMASH** - System Management Architecture for Server Hardware – 2005

**SMBIOS** - System Management BIOS – 1999

**SPDM** - Security Protocol and Data Model - 2019

For a complete list of standards and initiatives, visit [www.dmtf.org/standards](http://www.dmtf.org/standards)

DMI – 1994

DEN – 1997

WBEM – 1998

ASF – 2001

CDM – 2005

OVF – 2008

VMAN – 2009

WS-MAN – 2008

CMDBf – 2009

CADF – 2011

OSDDC – 2015

NETMAN – 2013



# DMTF Management Technologies

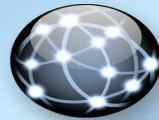
**Cloud  
Infrastructure**

**Virtualization**

**Server**

**Storage**

**Network**

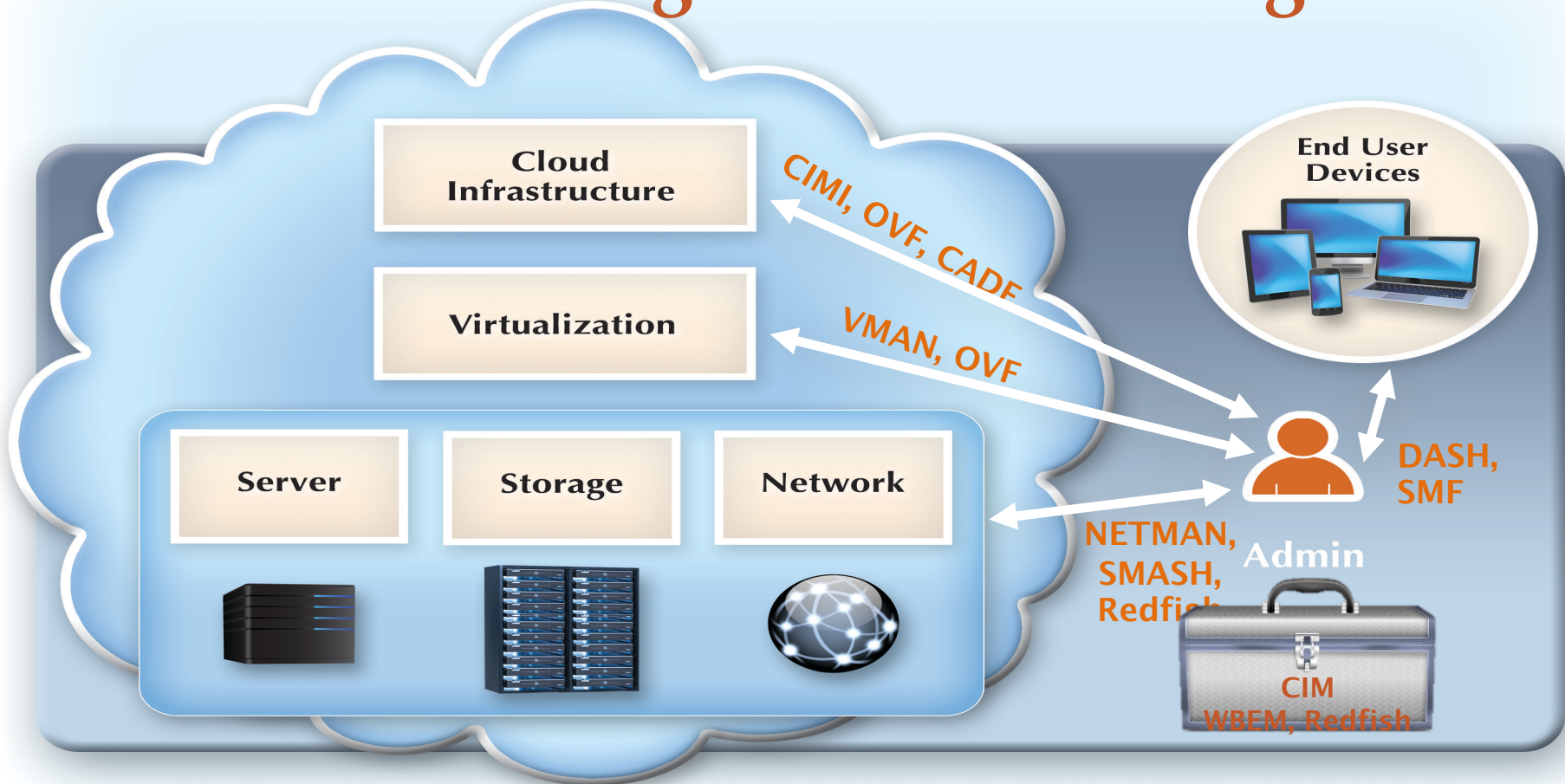


**End User  
Devices**

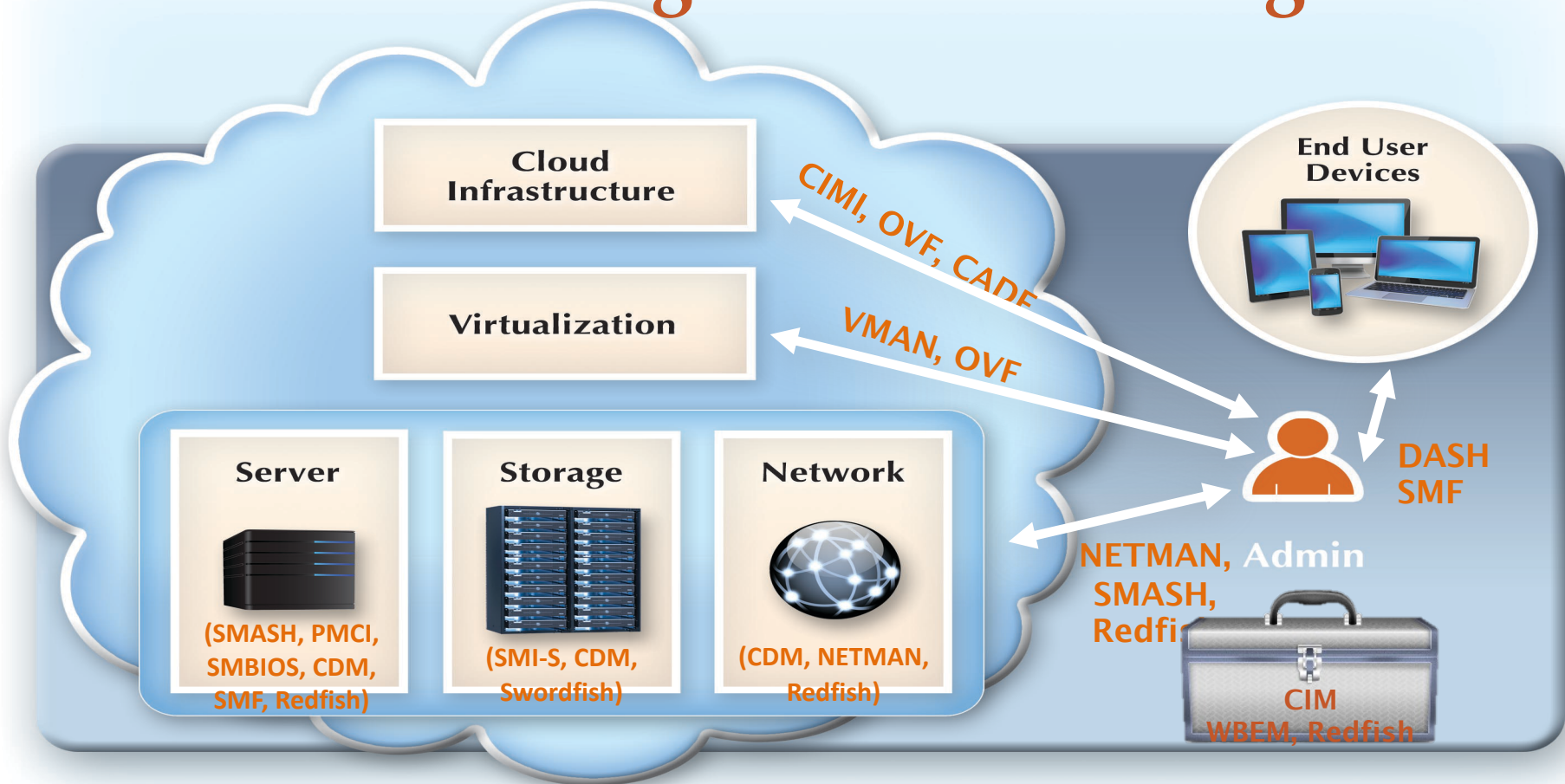


**Admin**

# DMTF Management Technologies



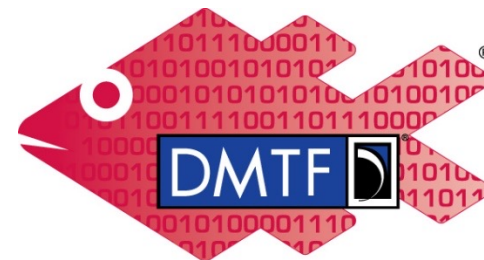
# DMTF Management Technologies





## What is Redfish?

- **Industry Standard Software Defined Management for Converged, Hybrid IT**
  - HTTPS in JSON format based on OData v4
  - Schema-backed but human-readable
  - Equally usable by Apps, GUIs and Scripts
  - Extensible, Secure, Interoperable
- **Initial release in 2015 focused on Servers**
  - A secure, multi-node capable replacement for IPMI-over-LAN
  - Represent full server category: Rackmount, Blades, HPC, Racks, Future
  - Intended to meet OCP Remote Machine Management requirement
- **Expand scope since then to the rest of IT infrastructure**
  - Additional features coming out approximately every 4 months
  - Working with SNIA to cover more advanced Storage (Swordfish)
  - Working with The Green Grid & ASHRAE to cover Facilities (DCIM)
  - Adapt IETF & other models to cover some level of Ethernet Switching
  - Work with Gen-Z & others to cover Fabrics



# Redfish





# Timeline of Redfish® Specification

## The DMTF Redfish technology

- Sep 2014: SPMF Formed in DMTF.
- Aug 2015: Redfish Specification with base models (v1.0)
- 2016: BIOS, storage, memory, fabrics, PCIe, update service, adv. comms devices, host interface, privilege registry
- 2017: Composability, location, PDUs, OCP & profiles
- 2018: LDAP/AD, SSE, assembly, OpenAPI, telemetry, jobs, certificates, common sensor model, FPGAs
- 2019: Spec Clean up; Additions to Certs, Telemetry, Console, Syslog, FW Update multipart, PCIe mods, Composition Registry, Ability to configure SNMP and SMTP services
- 2020: Adds Support for Network Device Registry, Secure Boot Database and Signatures, Adds Support for StorageDevice Message Registry, Adds Support for StorageDevice Message Registry, Addition of Connection and StorageController schemas, support for NVMe-over-Fabrics™, Incorporates the migration to new resource definitions
- 2021: Extends the composability model adds multi-client support, Adds OAuth 2.0 as a method of authorization, support for Licenses and License Management, Updated Operation apply time and Multipart HTTP operations to expand usage of *OperationApplyTimeSupport*
- 2022: Addition of SSH key related properties, properties in Chassis to represent containment of power and thermal relationships, and a method to register an existing system as a resource block, Rest to Default, Manager Network, Security Policy resource and new Sensor registry that defines general events from the Sensor model, support for multi-factor and client certificate-based authentication, CXL Support, Heater and HeaterMetric Schemas
- 2023: Added support for Cooling Distribution Units and CoolingLoops, enhancements to Drive and storage models with new DriveMetrics and StorageControllerMetrics, support for Application, Container, ContainerImage, OperatingSystem for container, operating system, and application management and MemoryRegion to support CXL dynamic capacity devices (DCD) as well as OutboundConnection for enabling connections to cloud-based services, added requirement for Outbound Connections to include the Sec-Websocket-Protocol header as "Redfish", added requirement that services shall accept empty JSON objects for actions that do not have required parameters and added ResolutionStep for providing a recommended step to resolve a condition
- 2024.1: addition of *ResetMetrics* to PortMetrics, NetworkAdapterMetrics, and NetworkDeviceFunctionMetrics schemas
- 2024.2: additions of TargetConfigurationLockLevel support, *NVMe*, and *BlockSecurityIDEnabled* to Drive, and TargetConfigurationLockLevel support and *SetControllerPassword* to Storage.
- 2024.3: additions of *Username* and *UserAuthenticationSource* to Event, LogEntry, Message, and Resource for event auditing and generalized Time-based One-Time Password properties and actions to AccountService and ManagerAccount.

## Alignment with other standard organizations

- Aug 2016: SNIA releases first model for network storage services (**Swordfish**)
- Working open YANG Redfish mapping algorithm for Ethernet Switch
- DMTF created work registers with **UEFI**, **TGG**, **OCP**, **ASHRAE**, **Broadband Forum**, **ETSI-NFV**, **NVMe**, **PICMG**, **Gen-Z**, **ODCC** for work on Redfish





# Redfish Developer Hub: [redfish.dmtf.org](https://redfish.dmtf.org)

## Resources

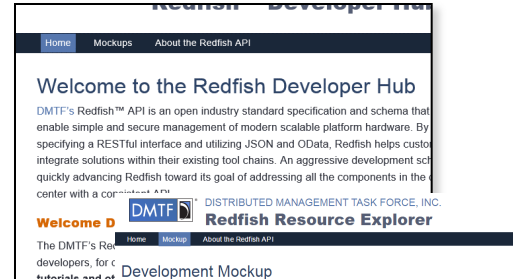
- Schema Index
- Specifications
- GitHub for Redfish Tools
- Registries
- Other Documentation

## Mockups

- Simple Rack-mounted Server
- Bladed System
- Proposed OCP Redfish Profile
- More being added

## Education/Community

- Redfish User Forum
- Whitepapers, Presentations
- YouTube shorts & Webinars



Development Mockup

```

redfish.v1/systems/1
{
  "@Redfish.Copyright": "Copyright © 2014-2015 Distributed Management Task Force, Inc. (DMTF). All rights reserved.",
  "@odata.context": "/redfish/v1/$metadata#System/Members/Sentry",
  "@odata.id": "/redfish/v1/systems/1",
  "@odata.type": "ComputerSystem.1.0.0/ComputerSystem",
  "id": "1",
  "Name": "My Computer System",
  "SystemType": "BladeSystem",
  "AssetTag": "Invent from asset tag",
  "Manufacturer": "Redfish",
  "Model": "Redfish",
  "Part": "Redfish",
  "PartNumber": "Redfish",
  "Serial": "Redfish",
  "Status": "OK",
  "Version": "Redfish"
}

```

Forum Section:

Topic	Threads	Posts	Last Post
Protocol and Specification	1	2	Retrieving in... by j... Sep 12, 2014
CSDL and json-schema	1	2	How to Location... under Red... by j... Aug 12, 2014
Feature Requests			On... webinterfa... over IP...

# Benefits of Standards

## For vendors and developers

- Creates a common framework from which to innovate
- Creates an ecosystem of interoperability that increases customer awareness and drives market adoption
- Reduces development costs
- Supports government policies and regulation for national (ANSI, ETSI) and international (ISO) standards
- Visibility for companies who participate

## For customers

- Achieve interoperability and portability
- Choose products based on feature innovation
- Standards-based best-practice solutions, where all vendors bring ideas to the table
- Reduced costs through increased ecosystem





## Join DMTF

The work of the DMTF is funded through membership dues that are among the most cost effective in the industry

By joining the DMTF, companies gain a valuable return on investment through:

- Early access and insights into the creation of DMTF specifications and underlying technologies - impact the industry by participating in the process of defining standards and programs
- Reduced development, design and start-up costs with access to DMTF's collaborative development tools, experts and broad knowledge base
- Opportunities to work alongside and interact directly with the industry's top specialists in interoperable management standards
- Increased visibility through the DMTF's industry-wide marketing efforts and initiatives



**For more information,  
visit [dmtf.org](http://dmtf.org)**

**Learn about membership at  
[dmtf.org/join](http://dmtf.org/join)**

**Thank you!**