DMTF Overview

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.**

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

DMTF - International Standards Leader

DMTF continues to grow its global presence

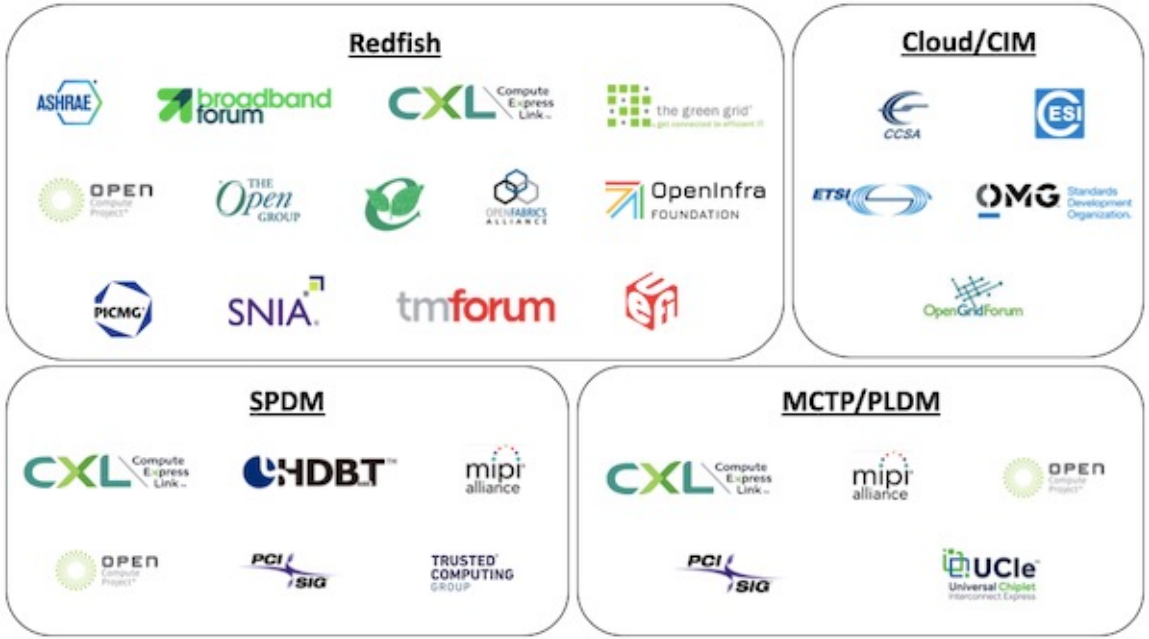
- DMTF has a global presence with members in multiple countries
- Members on:
  - ✓ ISO JTC1/SC 38 representation
  - ✓ ISO PAS submitter (only one of nine organizations in the world)

Open and Collaborative

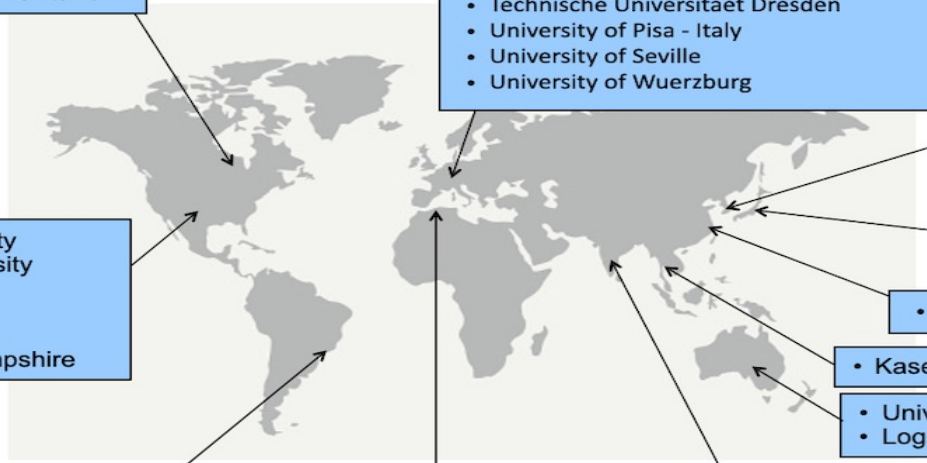
- Industry input on standards welcome via the DMTF Feedback Portal
- Open source development enabled within GitHub - DMTF invites review and contributions to its tools in public GitHub repositories
- Standards adopted by open source projects, including Java WBEM Services, Open Linux Management Infrastructure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

DMTF Alliance Partnership

DMTF and it's Alliance Partners develop a common dialogue and work together for the good of the industry, avoiding overlap and helping ensure interoperability



Academic Alliances (28)



- Athens University of Economics and Business
- Gheorghe Asachi Technical University of Iaşi
- Hungarian Academy Of Sciences Institute for Computer Science And Control
- National Technical University of Athens
- Paul Sabatier University
- Ruprecht-Karls-University Heidelberg
- Technische Universitaet Dresden
- University of Pisa - Italy
- University of Seville
- University of Wuerzburg

- University of Western Ontario

- Arizona State University
- George Mason University
- Marshall University
- Texas Tech University
- University of California
- University of New Hampshire

- Federal Institute of Technology of Espirito Santo
- Universidade de Sao Paulo

- Research Center on Scientific and Technical Information

- Dongguk University

- Institute of Information Security (IISEC)

- Shanghai Jiao Tong University

- Kasetsart University

- University of Sydney
- Logitrain

- Indian Institute of Technology Roorkee
- Swami Rama Himalayan University

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

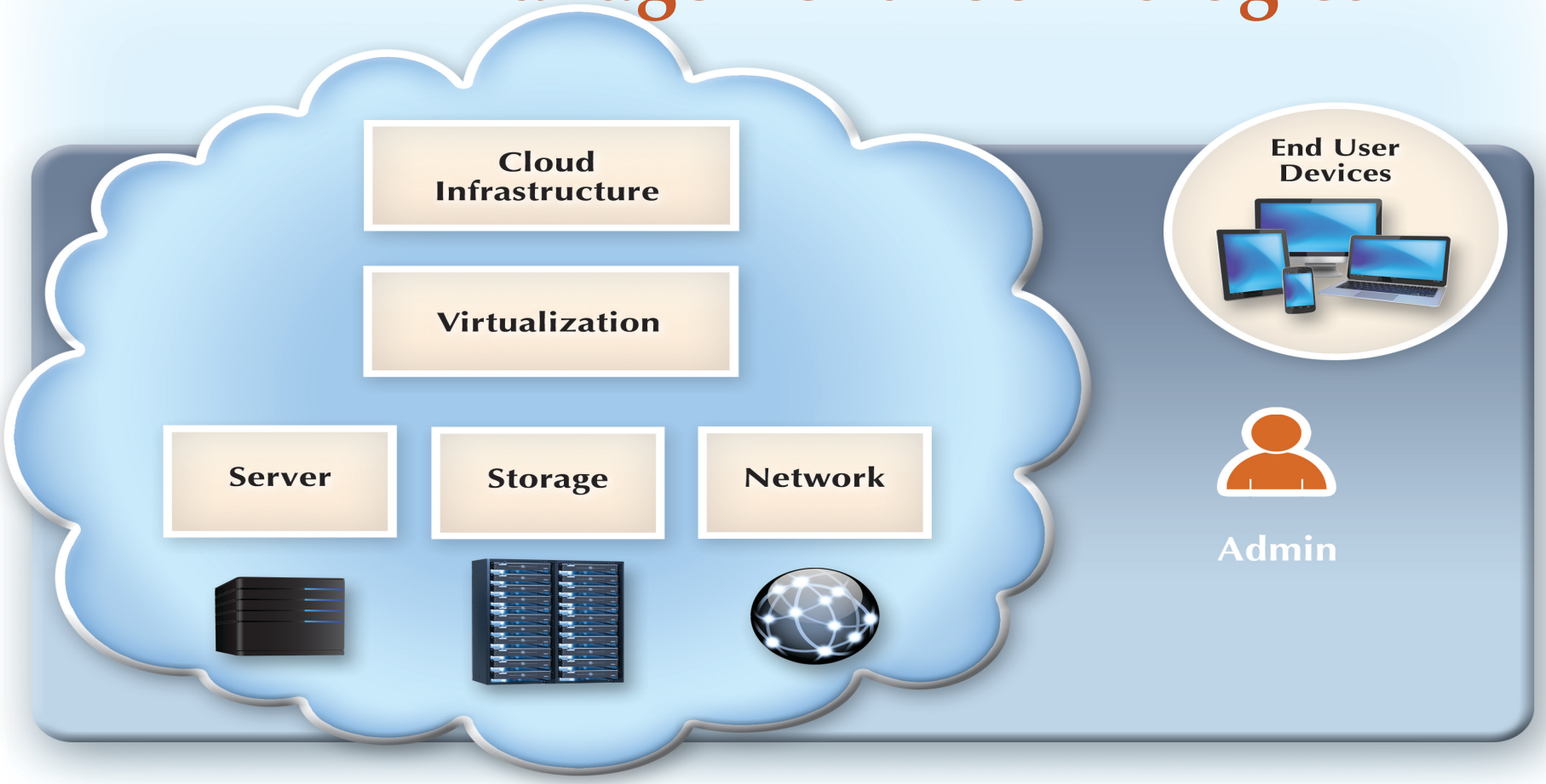
Active Standards

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

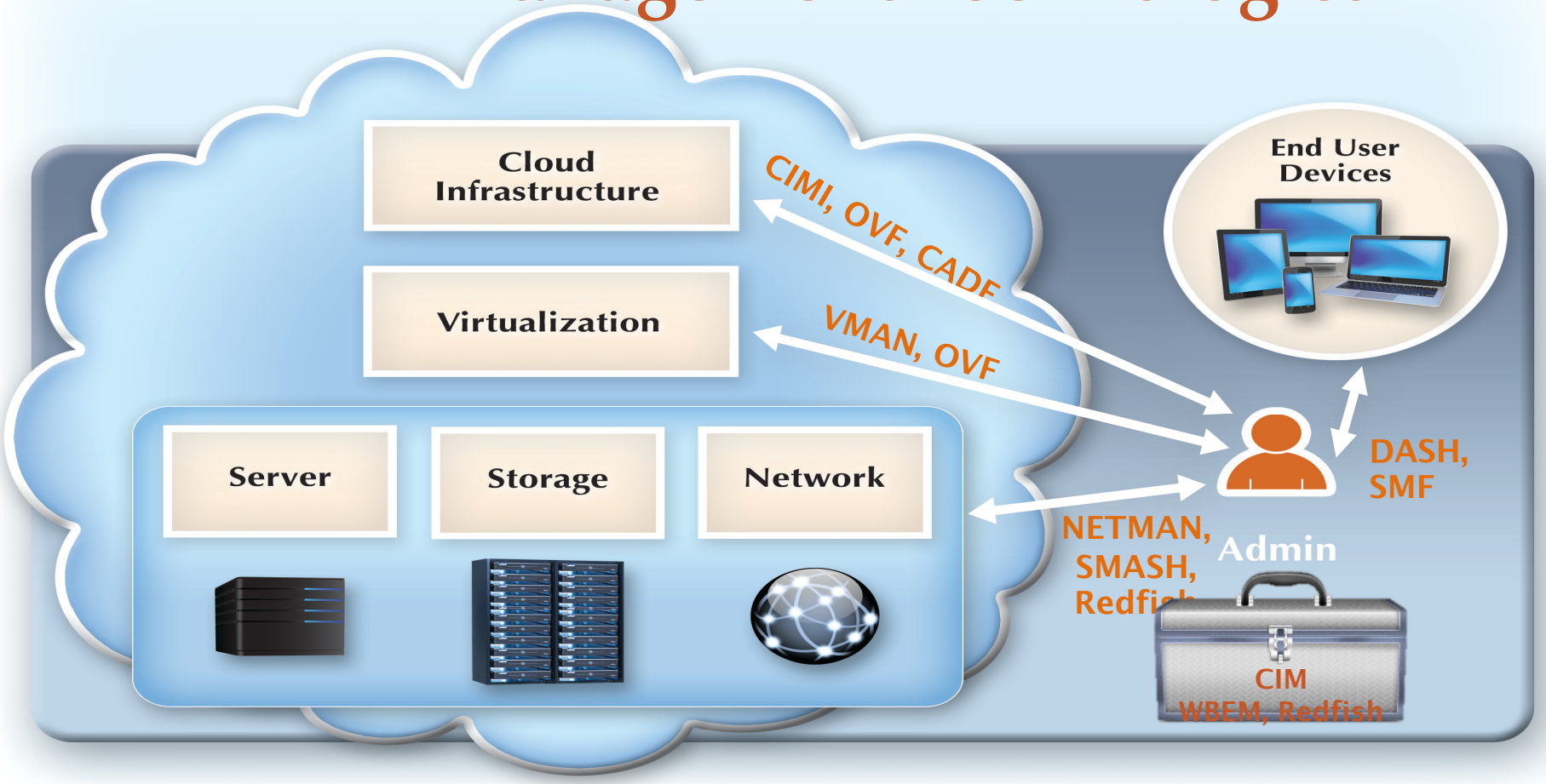
For a complete list of standards and initiatives, visit www.dmtf.org/standards

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

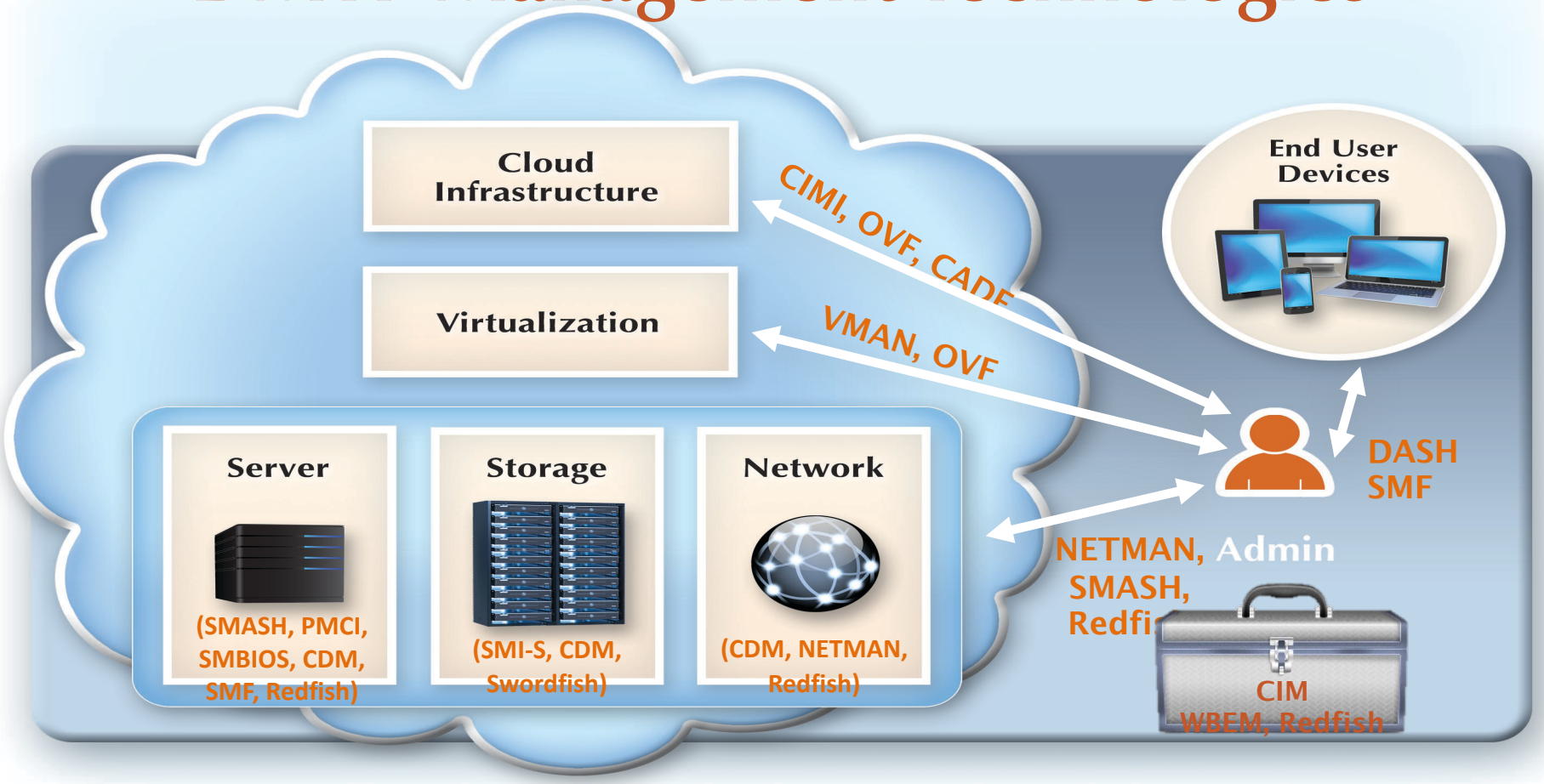
DMTF Management Technologies



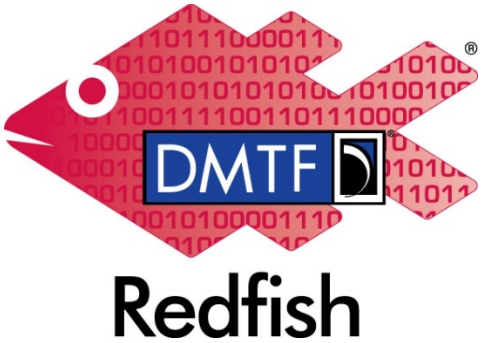
DMTF Management Technologies



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

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, Added support for Licenses and License Management, Updated Operation apply time and Multipart HTTP operations to expand usage of *OperationApplyTimeSupport*
  - 2022.1: 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.
  - 2022.2: Added Rest to Default, Manager Network, Security Policy resource and new Sensor registry that defines general events from the Sensor model.
  - 2022.3: Added support for multi-factor and client certificate-based authentication, CXL Support, Heater and HeaterMetric Schemas
  - 2023.1: Added support for Cooling Distribution Units and CoolingLoops, enhancements to Drive and storage models with ne DriveMetrics and StorageControllerMetrics
  - 2023.1: Added 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

- **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, OCUC for work on Redfish

Redfish Developer Hub: 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

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

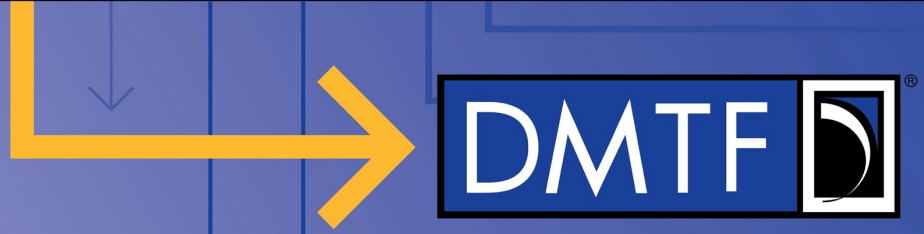
- Achieve interoperability and portability
- Choose products based on feature innovation
- Standards-based best-practice solutions, where all vendors bring ideas to the table
- Reduced costs through increased ecosystem

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

Learn about membership at
dmtf.org/join

Thank you!