



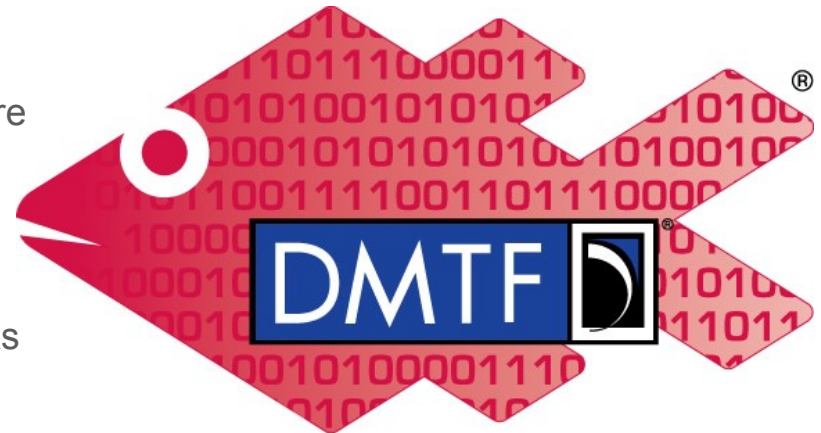
Redfish Release History

DMTF Redfish Forum
August 2019



Getting involved in Redfish

- Redfish Standards page
 - Schemas, Specs, Mockups, White Papers & more
 - <http://www.dmtf.org/standards/redfish>
- Redfish Developer Portal
 - Redfish Interactive Resource Explorer
 - Educational material, documentation & other links
 - <http://redfish.dmtf.org>
- Redfish User Forum
 - User forum for questions, suggestions and discussion
 - <http://www.redfishforum.com>
- DMTF Feedback Portal
 - Provide feedback or submit proposals for Redfish standards
 - <https://www.dmtf.org/standards/feedback>
- DMTF Redfish Forum
 - Join the DMTF to get involved in future work
 - <http://www.dmtf.org/standards/spmf>



Redfish



Releases

- 2019.2 – August 2019
- 2019.1 – May 2019
- 2018.3 – December 2018
- 2018.2 – August 2018
- 2018.1 – April 2018
- 2017.3 – December 2017
- 2017.2 – September 2017
- 2017.1 – May 2017
- 2016.3 – December 2016
- 2016.2 – September 2016
- 2016.1 – May 2016
- 1.0 – August 2015



Schema Guide and Property Guide

- **Redfish Resource and Schema Guide (DSP2046) v2019.2**
 - Presents schema definition contents in a more human-readable format
 - Description text taken directly from schema files
 - Includes example payloads for each schema
 - Updated for each DSP8010 release
- **Redfish Property Guide (DSP2053) v2019.2**
 - Provides an alphabetical list of all properties defined in Redfish schema
 - Useful for schema writers to locate existing definitions or properties
 - Helps avoid re-defining property names already in use
 - Description text taken directly from schema files
 - Updated for each DSP8010 release



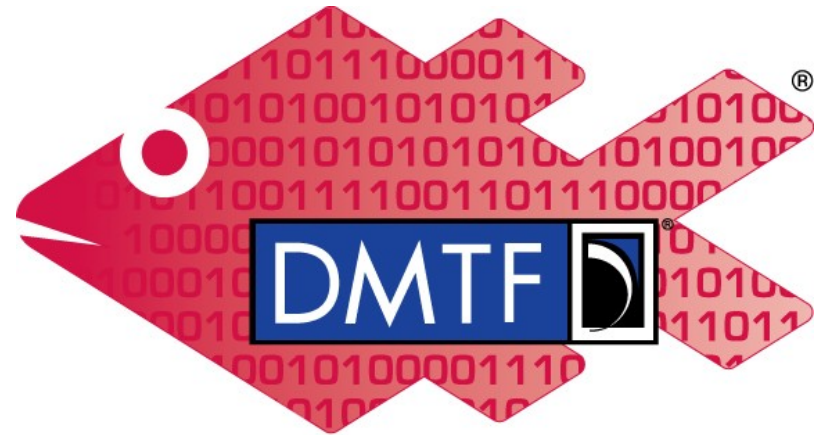
Redfish Release 2018.1

DMTF Redfish Forum
April 2018



Redfish Release 2018.1

- Redfish Specification v1.5.0
 - **NEW** Server-sent Eventing (SSE) Support
 - OperationApplyTime annotation
 - Behavior of Create, Delete or Action (POST) operations
- Redfish Specification v1.4.1
 - Errata release with numerous clarifications
- Redfish Schema Bundle 2018.1
 - **DSP8010_2018.1.ZIP** - contains current versions
- **NEW** Schemas v1.0.0
 - ExternalAccountProvider – LDAP / ActiveDirectory support
- Updated schemas (highlights)
 - AccountService – LDAP / ActiveDirectory support for Redfish
 - EventService & EventDestination – Server-sent Eventing support
 - Processor – Added “SubProcessor” information for Cores and Threads
 - Settings – Added “OperationApplyTime” and “MaintenanceWindow” support



Redfish



Redfish Specification v1.5.0 and v1.4.1

- Minor release of the Redfish Specification (DSP0266) v1.5.0
 - Adds support for Server Sent-Eventing (SSE)
 - Enables streaming events to web-based GUIs and other clients
 - OperationApplyTime annotation
 - Provides mechanism for specifying deterministic behavior for the application of Create, Delete or Action (POST) operations
 - Includes all errata from v1.4.1
- Errata release of the Specification (DSP0266) v1.4.1
 - Numerous clarifications and corrections, detailed in the Change Log

New Redfish Schemas for 2018.1

- ExternalAccountProvider v1.0.0
 - Single LDAP or ActiveDirectory instances are supported within updated AccountService resource
 - A Collection of “ExternalAccountProviders” describes additional providers, or allows for multiple LDAP/AD trees if Service supports their usage
 - Uses same properties and definitions as the single-instance LDAP and ActiveDirectory objects within AccountService



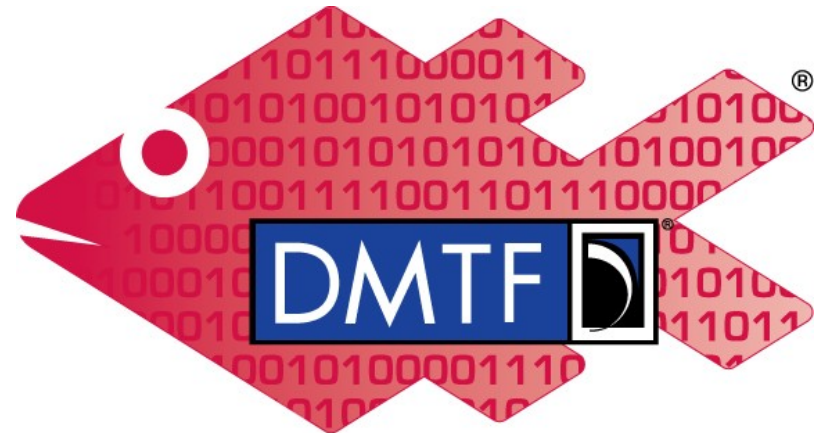
Redfish Release 2018.2

DMTF Redfish Forum
August 2018



Redfish Release 2018.2

- Redfish Specification v1.6.0
 - **NEW** OpenAPI v3.0 Support
 - **NEW** Telemetry Streaming & Eventing
 - Improved Event Subscription methods
- Redfish Specification v1.5.1
 - Errata release with numerous clarifications
- Redfish Schema Bundle 2018.2
 - **DSP8010_2018.2.ZIP** - contains all Redfish schemas
- Redfish Registries 2018.1
 - **NEW** 'Task', 'Resource' registries
 - Updated 'Base', 'Privilege' registries
- **13 NEW Schemas v1.0.0**
 - TelemetryService, MetricDefinition, MetricReportDefinition, MetricReport, Triggers
 - JobService, Job, PCIeSlots, (plus 5 Resource Collections)
- **29 Updated Schemas (highlights)**
 - Schedule v1.2.0 – Contribution from SNIA.org with minor additions
 - EventDestination v1.4.0, Event v1.3.0, MessageRegistry v1.2.0 – Improved subscriptions
 - Resource v1.7.0 – Added 'ContactInfo' array to commonly-used Location object



Redfish



Redfish for OpenAPI™ Specification v3.0

- OpenAPI Specification
 - A community-driven open specification from the OpenAPI Initiative (OAI), The Linux Foundation® Collaborative Project
 - Describes API services in a YAML-format definition document
 - Rich ecosystem of tools for developers and end users
- Supported by Redfish Specification v1.6.0
 - Added support for OpenAPI schema files (YAML)
 - Requires use of standardized URIs
 - Fixed URIs for all Redfish resources
 - Construct path to Collection member using “Id”
- Redfish Schema (DSP8010) bundle 2018.2
 - Now includes OpenAPI YAML files
 - Along with JSON Schema and CSDL files



OPENAPI
INITIATIVE



Redfish Specification v1.6.0

- Fixed or constructed URIs now specified
 - Required for OpenAPI v3.0 support
 - Previous Redfish versions allowed “hypermedia” URI structure, with each URI discovered via links in parent resources
 - Resource Collection members must use “Id” property as URI segment
 - All non-Collection resources must use URIs defined by schema
- Use *RedfishVersion* in *ServiceRoot* to check protocol version
 - Values of “1.6.0” or higher support OpenAPI and fixed URI definitions
 - For values below “1.6.0”, URI tree structure is not specified, clients continue to discover path from ServiceRoot
 - Examples:
 - “1.6.0”, “1.6.1”, “1.7.5”, “1.10.2” : supports OpenAPI
 - “1.5.1” : does not support OpenAPI – URI structure cannot be guaranteed



Redfish Message and Event Enhancements

- More flexible subscription modes
 - Subscribe to specific Registries or Resource Types instead of loosely defined classes
 - Added *SubordinateResources* which can be used in conjunction with *ResourceOrigin*
- Grouping **NEW**
 - *EventGroupId* property indicates that multiple messages share a root cause
- Telemetry support **NEW**
 - *EventFormatType* allows event delivery in either *Event* or *MetricReport* format
- SSE filtering **NEW**
 - Added support of *\$filter* for SSE event subscriptions
- New Message Registries
 - Added *Task* and *Resource* Message Registries
 - Expect more in the future that are more device/service specific.
- New Registry properties
 - Added *ClearingLogic* allowing a message to indicate that it resolves a previous situation
- OEM Registries
 - Clarified rules allowing OEMs to extend messages in the standard registries



Redfish Registries

- Released as **DSP8011_2018.1.ZIP**
- ResourceEvent Message Registry **NEW**
 - Defines messages for Resource-related events
- TaskEvent Message Registry **NEW**
 - Defines messages to use for Task-related events
- Base Message Registry v1.4.0
 - Added *NoOperation* message
- Base Message Registry v1.3.1
 - Errata release. Clarified description and message text for *GeneralError*
- Redfish Privilege Registry v1.0.3
 - Errata release correcting plurality of *ConfigureComponents* and correcting the JSON structure throughout
- Base Message Registry v1.3.0
 - Added *PropertyValueOutOfRange* and *SessionTerminated* messages
 - Previously approved for release but not posted publicly



NEW Redfish Schemas for 2018.2

- **TelemetryService** – Monitoring and reporting for Redfish
 - MetricDefinition – Defines a measurement point and its metadata
 - MetricReport – Output of the Telemetry Service
 - MetricReportDefinition – Defines the contents of a Report
 - Triggers – Methods for triggering output from the Telemetry Service
- **JobService** – Scheduled and complex tasks for Redfish
 - Job – Describes a single Job with scheduling and JSON payload
- **PCleSlots**
 - Physical PCIe slot information for each Chassis
- **Five Resource Collection schemas to support Telemetry and Jobs**



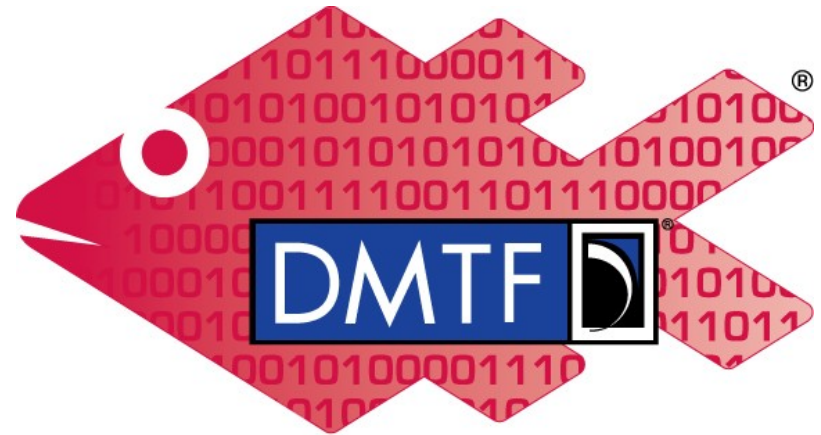
Redfish Release 2018.3

DMTF Redfish Forum
August 2018



Redfish Release 2018.3

- Redfish Specification v1.6.1
 - Errata release with numerous clarifications
- Redfish Schema Bundle 2018.3
 - **DSP8010_2018.3.ZIP**
 - Bundle contains all released Redfish schemas
- Redfish Registries 2018.2
 - Errata release of 'Task', 'Resource' registries
- Redfish Interoperability Profiles 2018.2
 - Errata releases of RedfishInteroperabilityProfile schema
- **10 NEW Schemas v1.0.0**
 - AccelerationFunction, ProcessorMetrics, Sensor, RedfishError
 - Certificate, CertificateLocations, CertificateService (plus 3 Resource Collections)
- **20 Updated Schemas (highlights)**
 - AccountService, ExternalAccountProvider, ManagerAccount – Added support for Certificates
 - ComputerSystem v1.6.0 – Added *AliasBootOrder* to allow for more usable Boot Order selection
 - Memory v1.7.0 – Replaced *SecurityStates* property with more usable properties
 - UpdateService v1.4.0 – Added *Username* and *Password* parameters to *SimpleUpdate*
 - Storage v1.6.0 – Added *SupportedRAIDTypes* to *StorageControllers*



Redfish



NEW Redfish Schemas for 2018.3

- **CertificateService – Managing Security Certificates**
 - CertificateService – Properties and Actions to manage security certificates
 - CertificateLocations – Location of all certificates within the resource tree
 - Certificate – Description of each security certificate
- **Sensor**
 - Core resource for defining a “sensor” in the Redfish data model
 - Expected usage throughout future DCIM and IoT resources
- **AccelerationFunction – FPGAs and Programmable silicon**
 - AccelerationFunction – Describes acceleration functions within a processor
 - ProcessorMetrics – Performance metrics (CPU, GPU, FPGA)
- **Three Resource Collection schemas to support all the above**
- **RedfishError**
 - Supporting schema definition useful for validating error response payloads



Certificate Management

- **NEW** Frequently-requested desire to manage certificates via the Redfish interface in an interoperable fashion
- **NEW** *CertificateService* resource off the Service Root
 - Contains service level Actions
 - GenerateCSR: Manage certificate signing requests from a user
 - ReplaceCertificate: Provide an atomic approach for deleting and adding a certificate
- **NEW** *CertificateCollection*
 - Perform standard Create and Delete operations for managing certificates
 - Collections added to resources that can have certificates installed to it
 - The location of the collection will inform the client about the relationship between the certificate and other resources in the data model
 - Able to control access to different certificate collections; some examples:
 - ConfigureSelf: Able to manage the certificates related to your account
 - ConfigureManager: Able to manage the certificates within the *Manager* tree
 - ConfigureComponents: Able to manage the certificates within the *ComputerSystem* tree
- **NEW** *CertificateLocations* resource contains links to all the certificates so administrators and auditors can easily obtain a complete set



Sensor

- **NEW** Sensor and SensorCollection is an architectural foundation for future Redfish resource definitions
 - Expect datacenter environmental equipment (e.g. power and HVAC) and IoT devices to take advantage of this model
- A Redfish Sensor is a monitoring device which produces a single reading
 - May include other related, time-coherent readings (e.g. Power, ReactiveVAR, etc.)
 - Reports physical context and other identification properties to describe its purpose
 - Metadata describing accuracy, sampling frequency, etc.
- Sensor resource includes:
 - *ReadingType* – The sensor type (temperature, voltage, etc.)
 - *Reading* – Value of the sensor (no Units in name to allow for generic software use)
 - *ReadingUnits* – Applies to all values in sensor (thresholds, reading)
 - Units shall be explicitly defined for each ReadingType to avoid mis-identification
 - Large-scale difference in magnitude handled by separate ReadingTypes (e.g. mW, kW)
 - *Thresholds* – Structured set of thresholds with a common definition
 - Severity, hysteresis, etc.



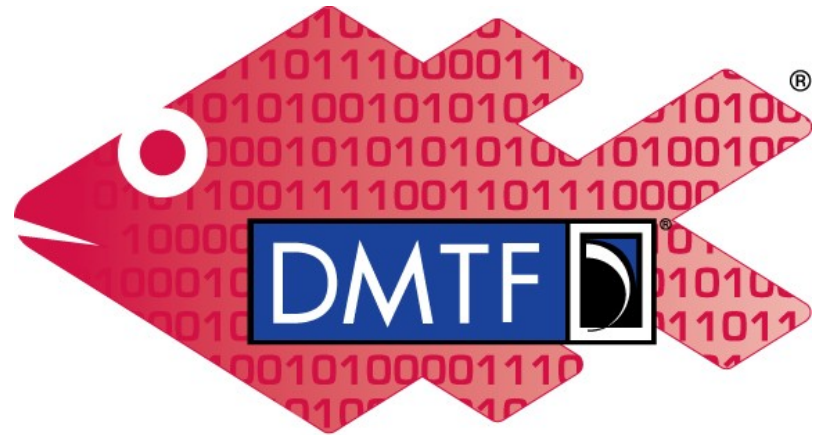
Redfish Release 2019.1

DMTF Redfish Forum
May 2019



Redfish Release 2019.1

- Redfish Specification v1.7.0
 - Significant clean-up of document for clarity
 - Improved account password management
 - Clarification of array property handling
- Redfish Schema Bundle 2019.1
 - Bundle contains all released Redfish schemas
- Redfish Host Interface v1.1.0
 - Numerous clarifications to SMBIOS table data
 - Added v2 of USB and PCIe device descriptors
- Redfish Message Registry Bundle 2019.1
 - Bundle contains all released Redfish message registries
- 19 Updated Schemas (highlights)
 - Certificate v1.1 – Added *Renew* and *Rekey* Actions
 - ManagerAccount v1.3 – Added *PasswordChangeRequired*
 - *Event* related schemas – Completed transition to new Event Subscription methods
- Download all published material at: <http://www.dmtf.org/standards/redfish>



Redfish



Redfish Specification v1.7.0

- Document renamed simply “Redfish Specification”
- **NEW:** Added Redfish Dictionary (RDE) file naming rules and repository
- **NEW:** Added Password Management clause to describe functional behavior when an account requires a password change
- **NEW:** Enhanced schema localization definitions and repository location
- Significant re-formatting and clean-up throughout document
 - Unless specifically mentioned, any change in normative language was unintentional and should be considered errata (please provide feedback)
- Protocol details now three separate clauses
 - General protocol description, Service requests, and Service responses
- Data model clause now separate from schema definition
- New clauses for each of the supported schema definition languages
 - OData CSDL, JSON schema and OpenAPI YAML



Redfish Specification v1.7.0, continued

- Normative clarifications (highlights)
 - Handling of array properties and PATCH operations on arrays
 - Clarified schema versioning methodology
 - Added missing statements regarding SSE in Event mechanism clause
 - Clarified that Event Subscriptions are persistent across service restarts
 - Clarified Task operations involving *@Redfish.OperationApplyTime* and *@Redfish.MaintenanceWindow* annotations
- See change log in document for complete list of clarifications



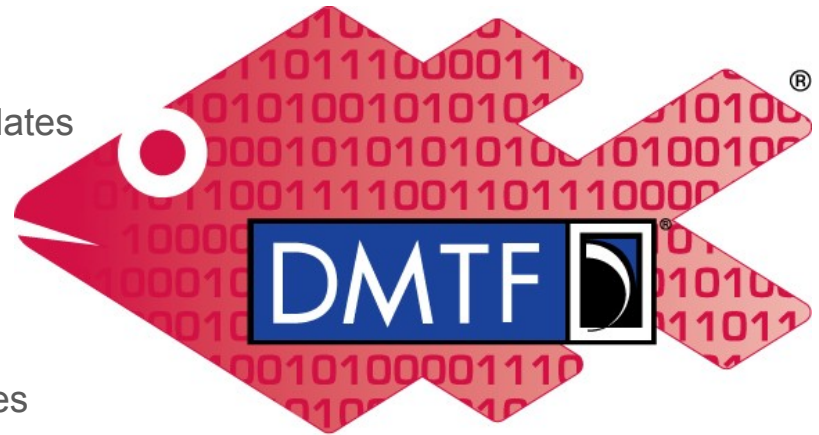
Redfish Release 2019.2

DMTF Redfish Forum
August 2019



Redfish Release 2019.2

- Redfish Specification v1.8.0
 - **NEW:** Standard multipart HTTP for software updates
 - *SubordinateResource* parameter for SSE
 - Defined URI for OpenAPI document
- Redfish Specification v1.7.1
 - Errata version of v1.7.0
 - Numerous clarifications for HTTP response codes
- Redfish Schema Bundle 2019.2
 - Bundle contains all released Redfish schemas
- Redfish Message Registry Bundle 2019.2
 - Bundle contains all released Redfish message registries
 - **NEW:** Composition Message Registry
- 17 Updated Schemas (highlights)
 - *MultipartPushUpdateUri* property in *UpdateService* to provide push-style software updates
 - Deprecated *PCleDevices* in *Links* in favor of new *PCleDevice* and *PCleFunction* Collections
- Download all published material at: <http://www.dmtf.org/standards/redfish>



Redfish



Redfish Specification v1.8.0

- **NEW:** Added support for standardized push-style software updates
 - Multipart HTTP format POST to URI specified by *MultipartHttpPushUri*
 - Form parts contain:
 - Redfish-defined JSON document for update parameters
 - Binary update file (software image)
 - OEM-defined additional data
- **NEW:** Added fixed URI location for OpenAPI document
 - */redfish/v1/openapi.yaml*
- Clarified that properties that contain “Uri” in their names are accessible using the Redfish protocol semantics
- Added *SubordinateResources* \$filter parameter for SSE



Redfish Forum Update



Ongoing discussions in the Redfish Forum

- SNMP protocol configuration
 - Configure SNMP managed device settings using Redfish
 - Provide standard method to configure existing OEM features
 - Support for SNMP-based Event delivery using event subscriptions
 - Expect Redfish standard MIB to describe SNMP Trap
 - Allow delivery of Redfish Events to existing SNMP management clients
- SMTP protocol configuration
 - Configure SMTP event delivery settings using Redfish
 - Provide standard method to configure existing OEM features
 - Support for SMTP-based Event delivery using event subscriptions
 - Expect standard attachment format to contain Redfish Event payload
 - Allow delivery of Redfish Events to existing email clients
 - Ensure additional JSON payload does not disrupt existing OEM message styles



Ongoing discussions in the Redfish Forum, continued

- SecureBoot certificate and key management
- Host Serial Console discovery
 - Specify capabilities and interoperable means to locate functionality
 - Differentiate between “OS console” and “BMC command line interface”
 - Support multi-host Manager implementations



Active Redfish Forum Task Forces

- **Legacy Removal Task Force**
 - Creating Message Registries to enable migration from IPMI SEL usage
 - Working with OS vendors to understand data requirements
 - Seeking end user feedback on ongoing usage of legacy protocols
- **Host Interface Task Force**
 - SMBIOS type 42 improvements
 - Kernel / OS credential handshaking
 - Defining additional standard methods for authentication
- **Data Center Infrastructure (DCIM) Task Force**
 - Completing work on Power Distribution schemas
 - Covering Rack-level PDUs, Floor PDUs, Automatic Transfer Switches
 - Expect to leverage PDU schemas for defining UPS schemas
 - Seeking to align Alarm schema with ISA / ANSI 18.2 practices

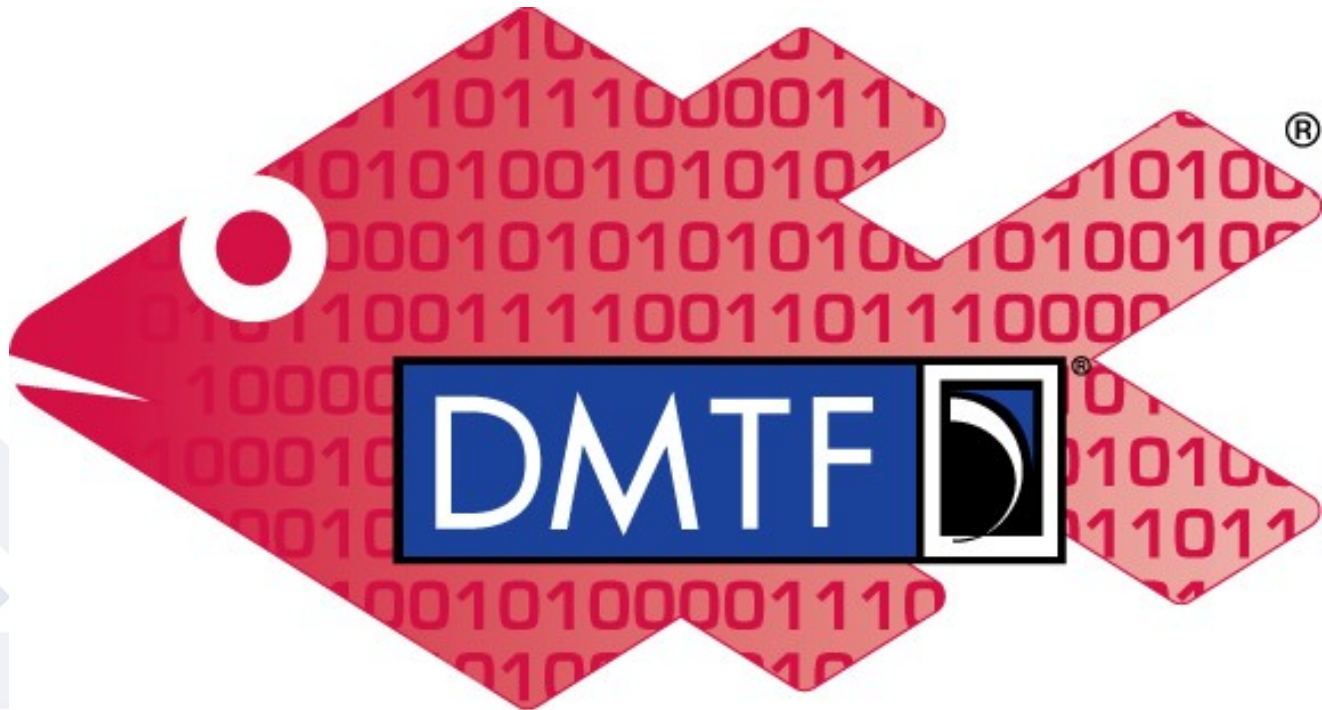


Active Redfish Forum Task Forces, continued

- Tools Task Force
 - Weekly builds of popular validation and developer tools
 - **NEW: Redfish Tackle Box** – “Microtools” for common Redfish operations
 - Download at: <https://github.com/DMTF/Redfish-Tacklebox>
 - Firmware update
 - Sensor, system inventory listings
 - Boot override, system power, and reset controls
 - Continued integration work with Ansible and OpenStack
 - Virtual media support
 - Firmware update
 - RAID management
- Fabrics Task Force
 - Enhancements to the data model to support Gen-Z fabric management



Q&A & Discussion



Redfish



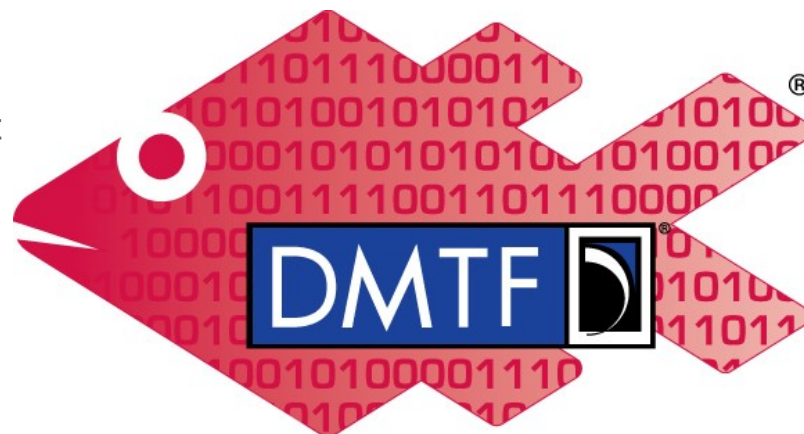
Redfish Release 2017.3

DMTF Scalable Platforms Management Forum
December 2017



Redfish Release 2017.3

- Redfish Specification v1.4.0
 - **NEW** query parameters: \$expand, \$filter, \$select
 - Clarified usage of HTTP response codes
 - Clarified HTTP header usage and requirements
 - Numerous other clarifications
- **NEW** Redfish Interoperability Profiles
 - New specification DSP0272 v1.0.0
 - New profile bundle DSP8013 v2017.1
 - Allows creation of property-level support checklist
- Redfish Schema Bundle 2017.3
 - **DSP8010_2017.3.ZIP** - contains current versions of all Redfish schema
- **NEW** Schemas v1.0.0
 - Assembly (manufacturing details), Boot Option (configure boot order)
- Updated schemas
 - Added multiple objects to EthernetInterface allowing complete DHCP configuration
 - Added properties to Power and Thermal to address feedback from ASHRAE and TGG
 - Numerous minor additions, errata and description clarifications throughout the schema



Redfish



Redfish Specification v1.4.0

- Minor release of the Specification (DSP0266)
 - Numerous clarifications and corrections, detailed in the Change Log
- Adds support for query parameters on GET requests
 - \$expand – Includes data from subordinate resources (especially collections) to allow highly-efficient data retrieval
 - \$select – Include only specified properties
 - \$filter – Include only members of a collection that match an expression
- Clarifications to HTTP header requirements and Status Code usage
 - Clarified HTTP status and payload responses after successful processing of data modification (POST, PATCH or PUT) requests
 - Added HTTP status code entries for 428 and 507 to clarify the proper response to certain error conditions
 - Detailed client's and service's HTTP header requirements and usage



Redfish Interoperability Profile Specification v1.0.0

- An “Interoperability Profile” provides a common ground for Service implementers, client software developers, and users
 - A profile applies to a particular category or class of product (e.g. “Front-end web server”, “NAS”, “Enterprise-class database server”)
 - It specifies Redfish implementation requirements, but *is not* intended to mandate underlying hardware/software features of a product
 - Provides a target for implementers to meet customer requirements and a baseline of schema and property-level support for software developers utilizing Redfish
 - Enable customers to easily specify Redfish functionality / conformance in RFQs
- Specification (DSP0272) defines a machine-readable Profile definition
 - JSON document designed to be human-readable and easy to create
- Profiles will be created by DMTF, partner organizations, and others
 - DMTF will provide re-publication via the Redfish Developer Hub
 - Published profiles will be included in a bundle for download (DSP8013)
- DMTF open source utility available to test conformance to a Profile
 - <https://github.com/DMTF/Redfish-Interop-Validator>

New Redfish Schemas

- **BootOption v1.0.0**
 - Describes a single, bootable target device for a Computer System
 - The BootOption Collection allows for configuration of boot order
 - Does not replace the temporary *BootSourceOverride* function
 - Boot Option describes the permanent boot order
 - Override is used for temporary (usually one-time) changes to the boot order
- **Assembly v1.0.0**
 - Describes manufacturing data useful for service personnel
 - Data usually stored in EEPROMs and heavily binary-encoded
 - Does not replace product identification properties (part #, serial #, etc.)
 - Single resource allows for multiple assembly descriptions
 - Adds mechanism to extract a binary image for service/support analysis
- **Protocol**
 - Supporting schema file to contain the common *Protocol* property



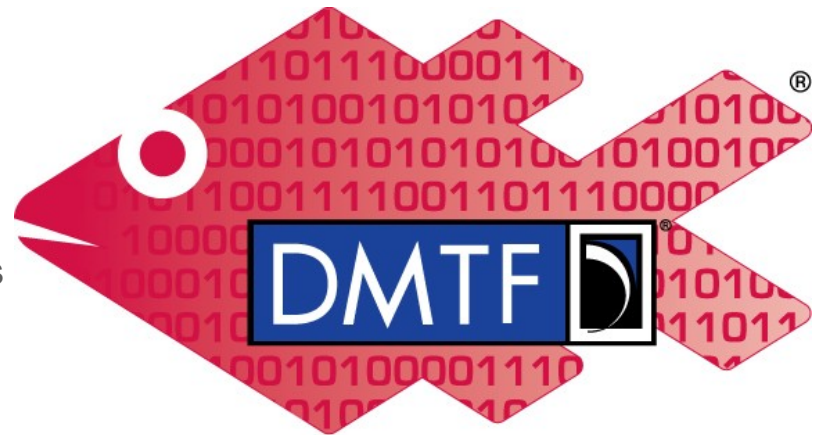
Redfish Release 2017.2

DMTF Scalable Platforms Management Forum
September 2017



Redfish Release 2017.2

- **Redfish Specification v1.3.0**
 - Adds “Apply Time” concept to Settings objects
 - Improves ETag support to avoid race conditions
 - Numerous clarifications
 - Also releasing v1.2.1 errata release
- **Redfish Schema Bundle 2017.2**
 - **DSP8010_2017.2.ZIP**
 - Contains current versions of all Redfish schema
- **Schema minor updates**
 - Expanded “Location” object definition to include physical locations at the building, room and intra-chassis levels.
 - Added "SupportedApplyTimes" to allow control over the application of Settings to a resource. This includes support for specifying maintenance windows.
 - Numerous errata and description clarifications throughout the schema
- **Base Message Registry v1.2.0**
 - Added new 'ResourceNotFound', 'ResourceExhaustion', 'StringValueTooLong' and 'EmptyJSON' messages.



Redfish



Redfish Specification v1.3.0

- Minor release of the Specification (DSP0266)
 - Service may optionally reject a PATCH or PUT operation if the If-Match or If-Match-None HTTP header is required
 - Allows Service to avoid race conditions from multiple clients performing PATCH or PUT operations, or clients using stale data from previous GETs
 - Returns HTTP 428 response code
 - Added support for a Service to describe the “Apply Time” for Settings
 - “SupportedApplyTimes” array in the “@Redfish.Settings” annotation
 - Reports available options for applying settings to that resource
 - Maintenance Window parameters available to schedule Settings
 - Clients use “@Redfish.PreferredApplyTime” annotation in request body
 - “ApplyTime” parameter describes options to apply settings
 - “Immediate”, “OnReset”, and several Maintenance Window options
 - Numerous clarifications and corrections, detailed in the Change Log
- Errata release v1.2.1 includes same clarifications and corrections



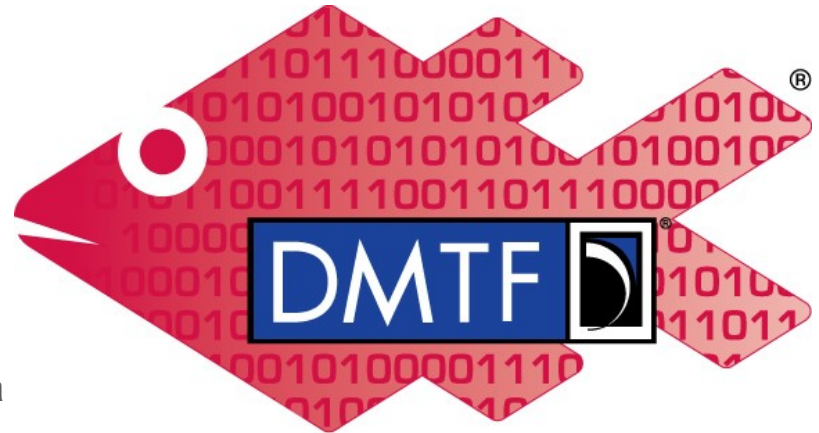
Redfish Release 2017.1

DMTF Scalable Platforms Management Forum
May 2017



Redfish Release 2017.1

- Redfish Specification v1.2.0
 - Adds Composability support
- Redfish Schema Bundle 2017.1
 - **DSP8010_2017.1.ZIP**
 - Contains current versions of all Redfish schema
- **NEW Schemas v1.0.0**
 - Composition Service
 - Resource Blocks for system composition
- Schema minor updates
 - Updates to provide support for system composition with new links between resources
 - Additions to UpdateService to support multiple targets for updates
 - Enhanced support for allocating memory regions
 - Numerous errata and description clarifications throughout the schema
- Base Message Registry Update v1.1.0
 - Added new “ResourceInStandby” message
- New mockups
 - Composability (perhaps two examples)



Redfish



Redfish Specification v1.2.0

- Minor release of the Specification (DSP0266)
 - Adds Composability to the standard
 - Numerous clarifications and corrections, detailed in the Change Log
- Composability support
 - Standardizes how services implement the Composition Service
 - Defines the types of composition requests a service is allowed to support
 - Defines the supporting resources required for each type of composition request
 - Defines baseline expectations a client can make when using the different composition requests



New Redfish v1.0.0 Schemas

- **CollectionCapabilities**
 - Allows for a service to provide an inline annotation for what a client is allowed to provide in the POST request for a Resource Collection
 - The underlying object is of the same type as the members of the collection and contains annotations for each property in terms of what's allowed in the POST request
- **CompositionService**
 - Entry point for the composition service
 - Contains sets of Resource Blocks and Resource Zones to express what's available to a client to compose
- **ResourceBlock**
 - Container object to express the building blocks available for compositions
 - Contains the composition status of the block in addition to the inventory of components that are within the block



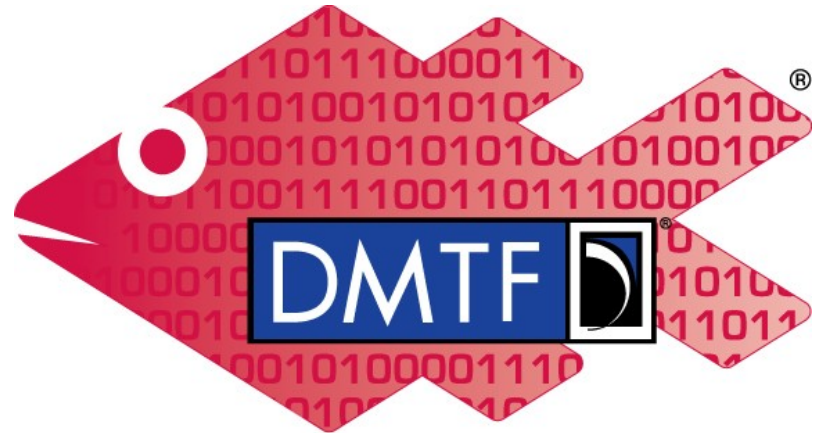
Redfish Release 2016.3

DMTF Scalable Platforms Management Forum
December 2016



Redfish Release 2016.3

- Redfish Specification v1.0.5
 - Errata release with numerous clarifications
- Redfish Specification v1.1.0
 - Adds Privilege Mapping
 - Adds Host Interface
- **NEW** Redfish Host Interface Specification
 - Describes IP / NIC-based host (OS) interface
- **NEW** Schemas v1.0.0
 - HostInterface, NetworkAdapter, NetworkInterface, NetworkDeviceFunction, NetworkPort, (collections of all the above), PrivilegeRegistry
- Schema minor updates
 - AccountService, Chassis, ComputerSystem, EthernetInterface, Manager, ManagerNetworkProtocol, Memory, MemoryDomain, Resource, SoftwareInventory, Thermal, UpdateService.
 - Numerous errata and description clarifications throughout the schema
- New mockups
 - Storage related mockups: Local Storage and SAS Fabric



Redfish



Redfish Specification v1.0.5

- Errata release of the Specification (DSP0266)
 - No new features or functionality in this release (errata only)
 - Numerous clarifications and corrections, detailed in the Change Log
- Various terminology clarifications for “Resource Collection” and “Members” so that the specification is consistent in their usage
 - Helps differentiate the general OData Collection from the Redfish Resource Collection

Redfish Specification v1.1.0

- Minor release of the Specification (DSP0266)
 - Adds Privilege Mapping to the standard
 - Adds the Host Interface to the standard
- Privilege Mapping
 - Defines a registry format for describing privileges for each type of entity, such as ComputerSystem
 - For each entity type, it maps the different roles for the different HTTP methods
 - Each entity type can also have override conditions for when to apply special sets of privileges, such as for a particular URI
- Host Interface
 - References new Host Interface specification for details



Redfish Host Interface Specification v1.0.0

- New specification (DSP0270)
- Defines an interface between a Host and its Redfish Service
 - This is to allow for local management operations similar to how a Host could collect information via IPMI over KCS
- Currently defines a network based interface
 - Extensions can be added later for different protocols as needs arise in the industry
- SMBIOS Type 42 (Management Controller Host Interface) has been expanded to add a new Interface Type (Network Host Interface)
 - The expanded type definition provides a way for the Host to find the address and credentials for its Redfish Service



New Redfish v1.0.0 Schemas

- **HostInterface**
 - Contains properties for describing and configuring a Redfish Host Interface
- **NetworkAdapter**
 - Describes general-purpose network adapters
- **NetworkInterface**
 - Provides linkages between NetworkAdapter, NetworkPort, and NetworkDeviceFunction instances
- **NetworkDeviceFunction**
 - Describes a logical interface exposed by a NetworkAdapter
- **NetworkPort**
 - Describes a discrete physical port capable of connecting to a network
- **PrivilegeRegistry**
 - Schema for definition of HTTP Operation to Privilege mapping



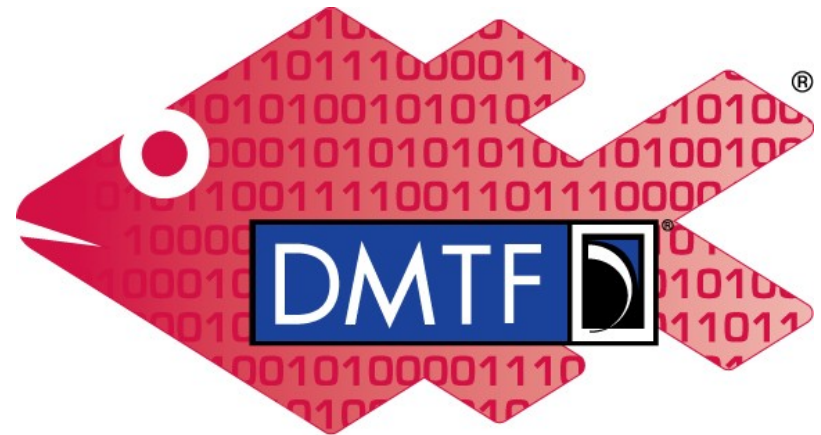
Redfish Release 2016.2

DMTF Scalable Platforms Management Forum
September 2016



Redfish Release 2016.2

- Redfish Specification v1.0.3 and v1.0.4 (errata)
- **NEW** Schemas v1.0.0
 - ActionInfo, Endpoint, Fabric, MemoryChunks, MemoryDomain, PCIeDevice, PCIeFunction, Port, SoftwareInventory, Switch, UpdateService, Zone
- Schema minor updates
 - Chassis, ComputerSystem, Drive, EthernetInterface, EventDestination, LogEntry, Manager, MemoryMetrics, Power, Redundancy, Resource, ServiceRoot, SessionService, Storage
- New mockups
 - Bladed System and Proposed OCP Profile



Redfish



New Redfish v1.0.0 Schemas (1 of 3)

- **ActionInfo**
 - Describes the parameters and other information necessary to perform a Redfish Action to a particular Action target
- **Endpoint**
 - An entity that sends or receives protocol defined messages over a transport
- **Fabric**
 - Consists of one or more Switches and may include Endpoints and Zones
 - Used to describe topologies
- **MemoryChunks**
 - Describes a chunk of memory and its associated interleave sets



New Redfish v1.0.0 Schemas (2 of 3)

- **MemoryDomain**
 - Used to indicate to the client which Memory (DIMMs) can be grouped together in Memory Chunks to form interleave sets or otherwise grouped together
- **PCleDevice**
 - Describes a PCI-e Device attached to a system
- **PCleFunction**
 - Describes a PCI-e Function
- **Port**
 - Describes a Port of a Switch
 - Connects to Switches, Endpoints, or other Ports
- **SoftwareInventory**
 - Describes an inventory of software components



New Redfish v1.0.0 Schemas (3 of 3)

- **Switch**
 - Describes a simple fabric Switch
 - Contains a set of Ports
- **UpdateService**
 - Describes the Redfish Update Service
 - Contains update actions and sets of Software Inventory entities
- **Zone**
 - Describes a simple fabric Zone
 - Used to map associated Endpoints and Switches into different partitions



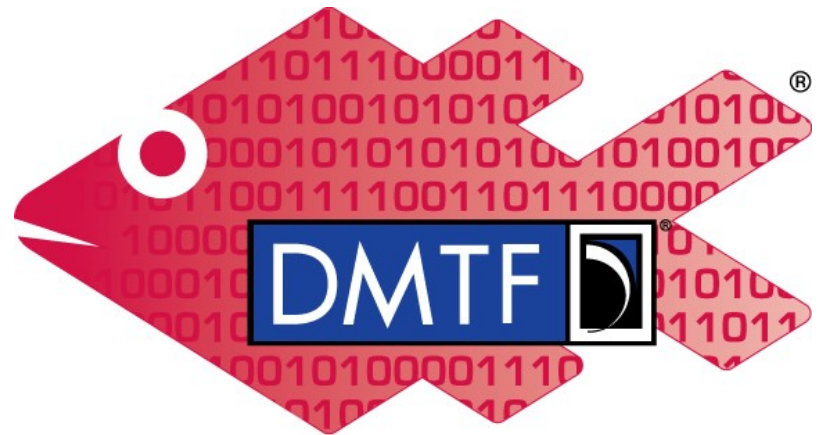
Redfish Release 2016.1

DMTF Scalable Platforms Management Forum
May 2016



Redfish Release 2016.1

- Redfish Specification v1.0.2 (errata)
- **NEW** Schemas v1.0.0
 - AttributeRegistry, Bios, Drive, Memory, MemoryCollection, MemoryMetrics, SecureBoot, Storage, StorageCollection, Volume
- Schemas v1.1.0 or v1.2.0 (minor revs)
 - Chassis, ComputerSystem, Event, Manager, Power, Resource, SimpleStorage, Thermal
- Schemas v1.x.2 (errata)



Redfish

Schema Release Bundles (posted at <http://www.dmtf.org/standards/redfish>)

DSP8010_2016.1: All new, minor, and errata 2016.1 schemas

Individual file contents also posted on <http://redfish.dmtf.org/schemas>

DSP8010_2016.0.9a: Work in Progress

New schemas under development within SPMF



Redfish Specification v1.0.2

- Errata release of the Specification (DSP0266)
 - No new features or functionality in this release (errata only)
 - Numerous clarifications and corrections, detailed in the Change Log
- Schema namespace rules were corrected
 - Schema versioning method conflicted with OData namespace definitions
 - Old: <schema name>.<major>.<minor>.<errata>
 - New: <schema name>.v<major>_<minor>_<errata>
 - Example: Chassis.v1_0_2 instead of Chassis.1.0.2
- OEM company-level property naming corrected
 - Use of colon ':' in JSON property names is problematic for some languages
 - Dot '.' separator also creates additional work for Javascript
 - Solution is to use underscore "_" instead for both of these cases
 - For compatibility, the colon and dot are allowed (but future use is discouraged)



New Redfish v1.0.0 Schemas (1 of 2)

- **Bios**
 - Allows viewing and changing System BIOS settings
 - Uses an AttributeRegistry to perform these functions
- **AttributeRegistry**
 - Adds ability to describe a large quantity of platform/vendor-specific properties (“attributes”)
 - Can describe usage and menu structures for user interface displays
- **SecureBoot**
 - Properties for managing the UEFI Secure Boot functionality of a system
- **Memory / MemoryCollection**
 - Adds detailed DIMM Inventory and status
- **Memory Metrics**
 - Statistics and performance metrics for individual memory modules



New Redfish v1.0.0 Schemas (2 of 2)

- **Storage / StorageCollection**
 - This schema defines a storage subsystem and its respective properties
 - Includes storage controller / subsystem properties and links to the resources such as volumes that can be accessed from that subsystem
- **Drive**
 - Detailed hard drive and SSD inventory and status
- **Volume**
 - Contains properties used to describe a volume, virtual disk, LUN, or other logical storage entity for any system