



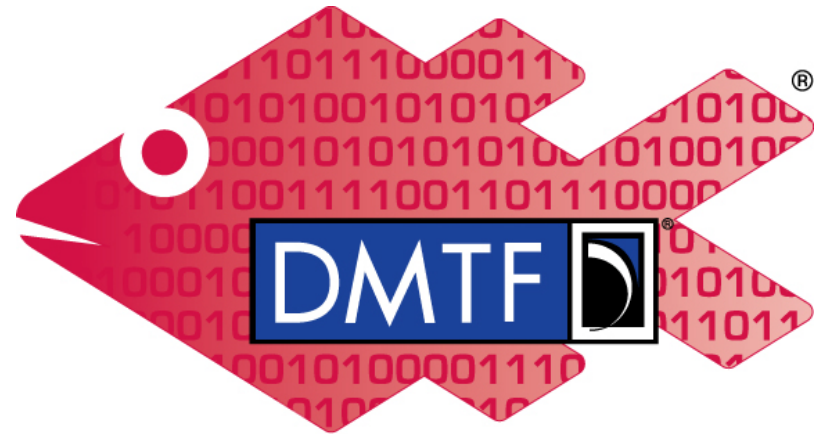
Redfish Release 2020.4

DMTF Redfish Forum
December 2020



Redfish Release 2020.4

- Redfish Specification v1.12.0
 - Adds “restricted role” and “restricted privilege” concepts for user accounts
- Redfish Specification v1.11.2
 - Errata release
- Redfish Schema Bundle 2020.4
 - DSP8010 contains all released Redfish schemas
- Redfish Message Registry Bundle 2020.4
 - DSP8011 contains all released Redfish registries
 - **NEW** Fabric and EthernetFabric message registries
 - Added messages to Base message registry to support Conditions array
- **7 NEW Schemas, 29 updated schemas**
 - Addition of PowerSubsystem, ThermalSubsystem, Fan, PowerSupply, PowerSupplyMetrics
 - Addition of EnvironmentMetrics for device-level reporting of environmental data (e.g. power and temperature)
 - See release notes in DSP8010 for errata details
- Download all published material at: <http://www.dmtf.org/standards/redfish>



Redfish



Migration to new resource definitions

- Three schemas have been replaced by new definitions, with the existing schemas deprecated in this release
 - **Power** – replaced by PowerSubsystem, PowerSupply, PowerSupplyMetrics, and EnvironmentMetrics
 - **Thermal** – replaced by ThermalSubsystem, Fan, and EnvironmentMetrics
 - **NetworkPort** – replaced by Port (existing, last revised in 2020.3)
- New implementations should use the new schemas
 - Services can implement both “old” and “new” to provide a migration path
 - New implementations can implement both if consistency with existing product families or client software is desired
- Deprecated schema files can be identified via:
 - CSDL: “Redfish.Revisions” annotation with “RevisionKind” of “Deprecated”
 - JSON schema: “deprecated” attribute in the un-versioned schema file
 - OpenAPI YAML: “deprecated” attribute in the un-versioned schema file



NEW PowerSubsystem and supporting schemas

- Replaces the **Power** schema with improved definitions
- **PowerSubsystem**
 - The equipment and connectivity that provides power to a Chassis
 - Redundancy group information
 - Streamlined definition from existing *Redundancy* object
 - Lays groundwork to populate batteries and other external power sources
- **PowerSupply**
 - Resource Collection for individual power supply (and bay) resources
- **PowerSupplyMetrics**
 - Support measurements for a well-instrumented power supply



NEW ThermalSubsystem and supporting schemas

- Replaces the **Thermal** schema with improved definitions
- **ThermalSubsystem**
 - The equipment and connectivity that provides cooling for a Chassis
 - Redundancy group information
 - Lays groundwork to populate other cooling equipment
- **ThermalMetrics**
 - Summary of temperature readings for interoperable comparison
 - Allows implementation to assign a particular sensor to a well-known “purpose”
 - Object contains readings for “Ambient”, “Intake”, “Internal”, and “Exhaust”
 - Array of all temperature readings for a Chassis
- **Fan**
 - Resource Collection for individual fan (and bay) resources



NEW EnvironmentMetrics schema

- Common schema used to report sensor readings specific to a Facility, Chassis or a device (e.g. Drive, Processor, Memory)
- Provides consistent naming for the sensor readings across the model
- Defined readings include:
 - Energy (kWh)
 - Fan speed (percent and RPM)
 - Humidity
 - Power
 - Temperature
- Resource contains schema excerpts with links to the Sensor resource that reports each *Reading*

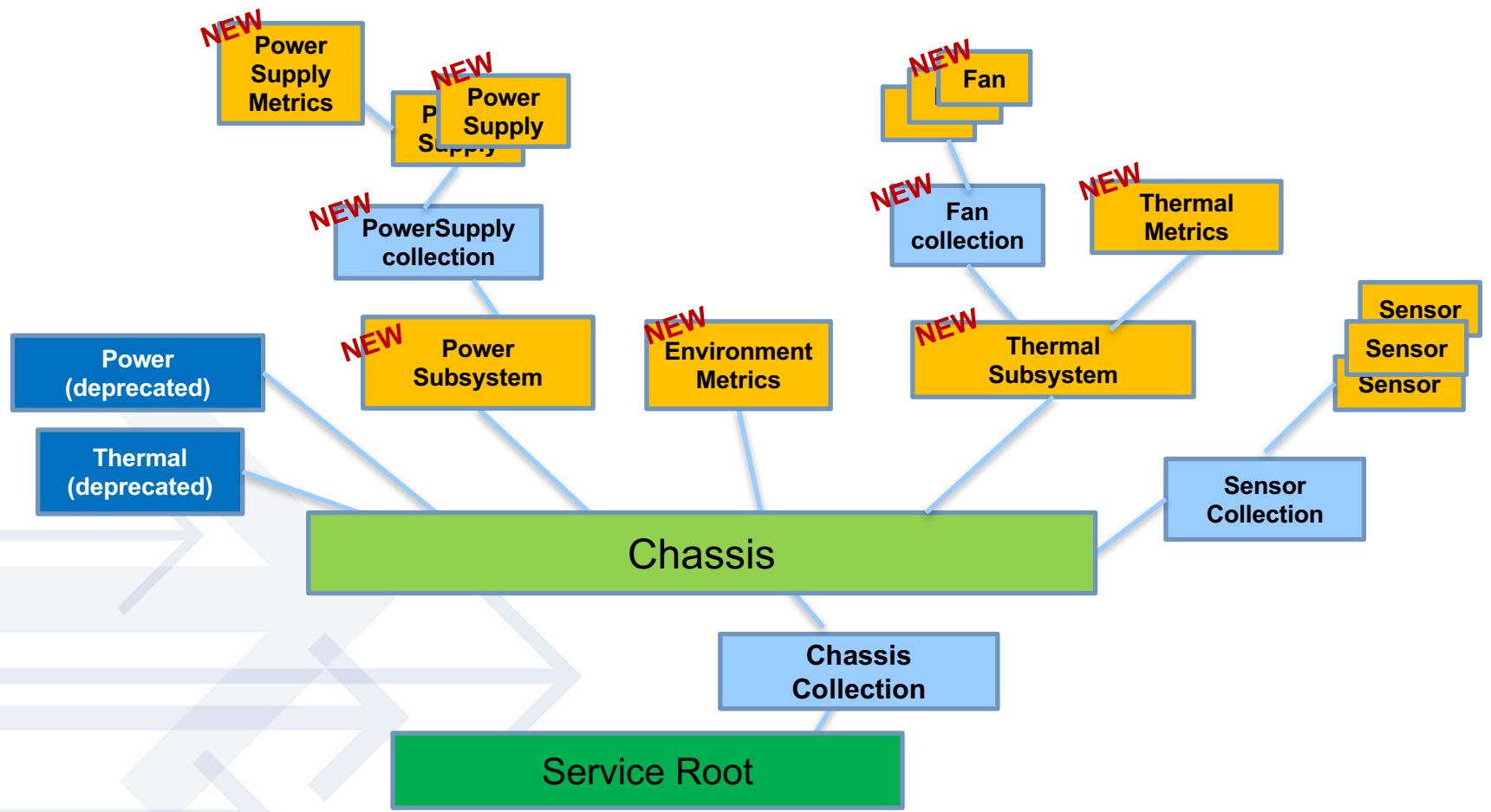


Power and Thermal Migration Summary

- **Power and Thermal** resources are completely replaced
- *Fans[0..n]* and *PowerSupplies[0..n]* become Resource Collections
 - Contain mostly static data for these devices (and their “bays”)
 - PowerSupply links to a PowerSupplyMetrics resource for sensor readings
- *Voltages[0..n]* and *Temperature[0..n]* become Sensor resources
 - Temperature readings now summarized in ThermalMetrics
 - Voltage readings move to PowerSupplyMetrics or the Sensor collection
- *PowerControl[0..n]* object split along functional lines
 - Power limits move to the appropriate resources
- Sensor excerpts added to EnvironmentMetrics resources as needed
 - Much easier to correlate “CPU readings” by starting at Processor instead of searching Sensor collection



Power and Thermal resource tree additions





NEW Additional AccountTypes

- Expanding functionality of *AccountTypes* in **ManagerAccount** to allow management of accounts for non-Redfish services or other functions
- Access can be granted to other protocols and services:
 - HostConsole - Allow access to the host's console
 - IPMI - Allow access to the IPMI service
 - KVMIP - Allow access to a Keyboard-Video-Mouse over IP session
 - ManagerConsole - Allow access to the manager's console
 - OEM - OEM account type. See the *OEMAccountTypes* property
 - Redfish - Allow access to the Redfish service
 - SNMP - Allow access to SNMP services
 - VirtualMedia - Allow access to control virtual media
 - WebUI - Allow access to a web-based user interface
- *SupportedAccountTypes[]* added to *AccountService*
 - Advertises which account types are supported by the service
- Granular privileges are supported by *StrictAccountTypes* property



NEW *Conditions* array in common *Status* definition

- Array of Messages and additional data which describe conditions that cause the *Health* or *HealthRollup* to be in “non-OK” states
 - Describes active conditions that need attention or user awareness
 - Not a replacement for Events or Log entries
- Definition within *Status* allows support to appear throughout model
 - Client can detect support by presence of the empty *Conditions* array
- A *Condition* element may contain an *OriginOfCondition*
 - Link to a subordinate or related resource where the condition originated
 - Absence indicates the origin of the condition is within the resource
- Allows for a unified “follow the red” pathway through the model
 - New Base message “ConditionInRelatedResource” defined to indicate a condition exists in a subordinate or related resource



Example *Conditions* array

```

“status”: {
  “health”: “Critical”,
  “healthRollup”: “Warning”,
  “state”: “Enabled”,
  “conditions”: [{
    “messageId”: “StorageDevice.1.0.writeCacheDegraded”,
    “timeStamp”: “2020-11-08T12:25:00-05:00”,
    “message”: “The write cache state on the storage controller located in ‘slot 4’ is degraded.”
    “messageSeverity”: “Critical”,
    “messageArgs”: [ “slot 4” ],
    “logEntry”: { “@odata.id”: “/redfish/v1/Systems/1/LogService/MyLog/7865” }
  },
  {
    “messageId”: “Base.1.9.ConditionInRelatedResource”,
    “originOfCondition”: { “@odata.id”: “/redfish/v1/Chassis/1U/Drives/9” },
    “message”: “One or more conditions exist in a related resource.  See the
      originOfCondition property.”
    “messageSeverity”: “Warning”
  }
  ]
}

```

This *Condition* originated from this resource

MessageId, *Message*, and *MessageSeverity* come from a Message Registry

LogEntry link allows correlation to events

This *Condition* is a rollup of one or more conditions in a related resource located at the *OriginOfCondition*



Redfish Schema Minor Revisions (1 of 7)

- **AccountService v1.8.0**
 - Added *RestrictedPrivileges*, *RestrictedOemPrivileges*, *SupportedAccountTypes*, and *SupportedOEMAccountTypes* properties
 - Added *TACACSplus* property for configuring external authentication via TACACS+
 - Added *Priority* property to external account providers
- **AggregationSource v1.1.0**
 - Added *SNMP* property for configuring SNMP aggregation sources
- **Chassis v1.15.0**
 - Added *Certificates*, *Measurements*, *PowerSubsystem*, *ThermalSubsystem*, and *EnvironmentMetrics* properties.
 - Deprecated *Power* and *Thermal* links in favor of the new *PowerSubsystem*, *ThermalSubsystem*, and *EnvironmentMetrics* link properties
- **Circuit v1.2.0**
 - Added *DC48* to *NominalVoltageType*



Redfish Schema Minor Revisions (2 of 7)

- **ComputerSystem v1.14.0**
 - Added *Certificates* and *Measurements* properties
 - Added *TrustedModuleRequiredToBoot* to *Boot*
 - Added *CoreCount* to *ProcessorySummary*
- **Drive v1.12.0**
 - Added *Certificates*, *Measurements*, and *EnvironmentMetrics* properties
- **EventDestination v1.10.0**
 - Added *AuthenticationKeySet* and *EncryptionKeySet* properties
 - Added *HMAC128_SHA224*, *HMAC192_SHA256*, *HMAC256_SHA384*, and *HMAC384_SHA512* to *SNMPAuthenticationProtocols*
 - Added *RetryForeverWithBackoff* to *DeliveryRetryPolicy*
- **ExternalAccountProvider v1.2.0**
 - Added *TACACSplusService* property for configuring external authentication via TACACS+
 - Added *Priority* property



Redfish Schema Minor Revisions (3 of 7)

- Facility v1.1.0
 - Added *EnvironmentMetrics* and *AmbientMetrics* properties
- LogEntry v1.8.0
 - Added *Resolved* property
- Manager v1.11.0
 - Added Location, LocationIndicatorActive, and SparePartNumber properties
- ManagerAccount v1.7.0
 - Added StrictAccountTypes property
 - Added HMAC128_SHA224, HMAC192_SHA256, HMAC256_SHA384, and HMAC384_SHA512 to SNMPAuthenticationProtocols.
 - Extended AccountTypes enumeration to add HostConsole, ManagerConsole, IPMI, KVMIP, VirtualMedia, and WebUI



Redfish Schema Minor Revisions (4 of 7)

- **Memory v1.10.0**
 - Added *SparePartNumber*, *Model*, *Certificates*, *Measurements*, and *EnvironmentMetrics* properties
 - Added *Processors* to *Links*
 - Added HBM3, GDDR, GDDR2, GDDR3, GDDR4, GDDR5, GDDR5X, GDDR6, DDR5, and OEM to *MemoryDeviceType*
- **MetricReportDefinition v1.4.0**
 - Added *Oem* to *Metrics*
- **NetworkAdapter v1.6.0**
 - Added *Certificates* and *Measurements* properties
- **NetworkPort v1.4.0**
 - Deprecated schema in favor of Port schema
- **PCleDevice v1.6.0**
 - Added *SparePartNumber* property



Redfish Schema Minor Revisions (5 of 7)

- **PhysicalContext**
 - Added *TrustedModule* physical context type
- **Power v1.7.0**
 - Deprecated schema in favor of *PowerSubsystem* schema
- **Processor v1.11.0**
 - Added *MemorySummary*, *SparePartNumber*, *Certificates*, *Measurements*, and *EnvironmentMetrics* properties
 - Added *Memory* to *Links*
- **ProcessorMetrics v1.2.0**
 - Added *CacheMetrics* property
 - Added *ClearCurrentPeriod* action for clearing the *CurrentPeriod* property within *CacheMetrics*
 - Deprecated temperature related properties in favor of the *EnvironmentMetrics* resource



Redfish Schema Minor Revisions (6 of 7)

- **Redundancy**
 - Added *RedundantGroup* definition to migrate away from the Referenceable Member definition for redundancy
- **Resource v1.11.0**
 - Added *Conditions* property to Status for showing details about items that need attention in a resource
- **Role v1.3.0**
 - Added *Restricted* and *AlternateRoleId* properties
- **Sensor v1.2.0**
 - Added *RelatedItem*, *SpeedRPM*, and *DeviceName* properties.
 - Added *UpperCautionUser*, *UpperCriticalUser*, *LowerCautionUser*, and *LowerCriticalUser* to *Thresholds*.
- **SoftwareInventory v1.4.0**
 - Added *Measurement* property.
 - Added *MeasurementBlock* definition for containing SPDM-related measurement information



Redfish Schema Minor Revisions (7 of 7)

- Storage v1.10.0
 - Added *Certificates* and *Measurements* to *StorageControllers*.
- StorageController v1.1.0
 - Added *Certificates* and *Measurements* properties
- Switch v1.5.0
 - Added *Certificates* and *Measurements* properties
- TelemetryService v1.3.0
 - Added *ClearMetricReports*, *ResetMetricReportDefinitionsToDefaults*, and *ResetTriggersToDefaults* actions.
- Thermal v1.7.0
 - Deprecated schema in favor of ThermalSubsystem schema
- VLanNetworkInterface v1.2.0
 - Added *VLANPriority* property
- Zone v1.6.0
 - Added *ZoneOfResourceBlocks* to *ZoneType*



Errata Schema Revisions (1 of 2)

- **Event v1.x.x**
 - Updated descriptions to reference the "MessageId format" clause in the specification.
 - Fixed description of EventId to be consistent with the specification
- **EventDestination v1.x.x**
 - Clarified the descriptions for EventFormatType to specify the relationship with the Protocol property.
 - Removed requirement for DeliveryRetryPolicy to have a default value if not specified
- **Memory v1.x.x**
 - Removed the term *DC* from the description of the *IntelOptane* memory type
- **Message v1.x.x**
 - Updated descriptions to reference the "MessageId format" clause in the specification



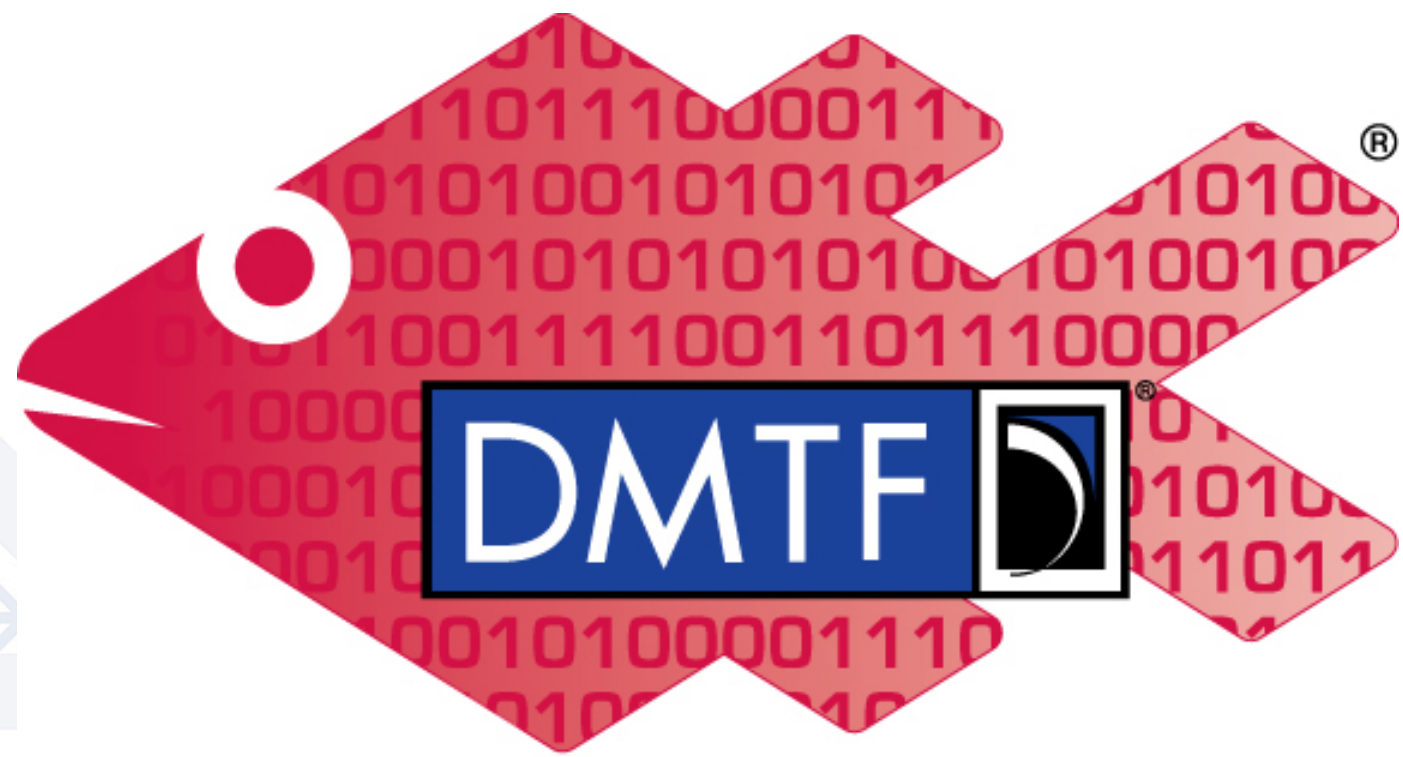
Errata Schema Revisions (2 of 2)

- **MessageRegistry v1.x.x**
 - Clarified that Severity and MessageSeverity can be replaced in events and messages by a value determined by the service.
- **MetricReport v1.x.x**
 - Clarified behavior for when a metric report is deleted.
- **NetworkDeviceFunction v1.x.x**
 - Corrected the description for the iSCSI value for BootMode to allow for Ethernet devices.
- **PCleSlots v1.4.1**
 - Corrected placement of the LocationIndicatorActive to be within a given slot
- **(various schemas and versions)**
 - Removed non-normative term "must" from long descriptions.
 - Regenerated several schemas to mark integer properties as 64-bit in OpenAPI definitions.



Schema Guide, Property Guide, and Schema Supplement

- Guide documents are updated for each schema (DSP8010) release
 - Description text for properties taken directly from schema files
 - DMTF documentation generator creates these guide documents
- Redfish Resource and Schema Guide (DSP2046)
 - Presents schema definition contents in a more human-readable format
 - Includes example payloads for each schema
- Redfish Property Guide (DSP2053)
 - 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
- Redfish Schema Supplement (DSP0268)
 - Presents normative (“LongDescription”) schema definition contents
 - Useful for Redfish Service developers to ensure conformance



Redfish