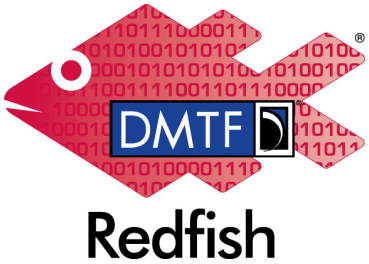

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17 This document's normative language is English. Translation into other languages is permitted.

Contents

Foreword

This Informational Specification covers a proposal to enhance the Power and Thermal monitoring schemas for Redfish.

IMPORTANT: These documents are not final. They do not necessarily reflect the views of the DMTF or its members. Because these documents are a Work in Progress, these documents may still change, perhaps profoundly and without notice. These documents are available for public review and comment until superseded.

The following files are part of the Redfish Power and Thermal Enhancement proposal:

- wip-newpowerthermal - Mockup containing a ComputerSystem and Chassis showing both th e exiting Power and Thermal schema implementation, along with the proposed PowerSubsys tem and ThermalSubsystem resource tree.
- DSP-IS0015_v0.9a.pdf - Presentation describing the Redfish Power and Thermal Enhancem ent proposal

How can I provide feedback?

Feedback on all Redfish specifications and documents is encouraged. Feedback can be directed to the DMTF and the Redfish Forum by the following means:

- **Redfish User Forum:** http://www.redfishforum.com User forum monitored by DMTF Redfish Forum personnel to answer questions about any Redfish-related topics.
- **DMTF Feedback Portal:** https://www.dmtf.org/standards/feedback Formal submission portal for enhancements or proposals to the DMTF and Redfish Forum.
- **Redfish Github Repository:** DMTF Redfish Forum member companies are encouraged to o pen issues on the group's private repository on Github.

Where can I find more information?

The following web sites provide more information about the Redfish standard:

- **Redfish Developer Hub:** http://redfish.dmtf.org Resources for developers building applicatio ns using Redfish. Contains an interactive schema explorer, hosted schema and other links.
- **Redfish User Forum:** http://www.redfishforum.com User forum monitored by DMTF Redfish personnel to answer questions about any Redfish-related topics.
- **DMTF Github Repositories:** http://www.github.com/DMTF Open source tools and libraries f or working with the Redfish API.
- **Redfish Standards:** http://www.dmtf.org/standards/redfish Schemas, specs, mockups, white papers, FAQ, educational material and more.
- **DMTF Redfish Forum** (Working group that maintains the Redfish standard): http://www.dmt f.org/standards/spmf Companies involved, upcoming schedules and future work, charter, and information about joining.

Using the reference guide

The proposed power and thermal subsystem schemas are listed in the following section for reference. This section should be considered an extension to the contents of DSP2046, the Redfish Resource and Schema Guide, which lists the common Redfish properties, other object definitions, and all released Redfish schemas (including those shown here).

This guide was produced using the contents of the schema files from DMTF Redfish Schema bundle DSP8010 and merged with supplemental text using the DMTF's Redfish Documentation Generator.

Common Properties

Properties and objects defined for all Redfish schemas, or referenced by this white paper are detailed in the Redfish Resource and Schema Guide (DSP2046), available for download at the Redfish Standards site: http://www.dmtf.org/standards/redfish

39 # Schema Reference Guide

40 ## Chassis 1.15.0

v1.15	*v1.14*	*v1.13*	*v1.12*	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	...
TBD	2020.3	2020.2	2020.1	2019.4	2019.2	2018.3	2018.2	2018.1	2017.3	2017.1	...

41 The Chassis schema represents the physical components of a system. This resource represents the sheet-metal confined spaces and logical zones such as racks, enclosures, chassis and all other containers. Subsystems, such as sensors, that operate outside of a system's data plane are linked either directly or indirectly through this resource. A subsystem that operates outside of a system's data plane are not accessible to software that runs on the system.

42 ### URIs:

/redfish/v1/Chassis/*{ChassisId}*

Assembly *(v1.6+)* {	object		The link to the assembly associated with this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
AssetTag	string	read-write (null)	The user-assigned asset tag of this chassis.
ChassisType	string (enum)	read-only required	The type of physical form factor of the chassis. *For the possible property values, see ChassisType in Property details.*
DepthMm *(v1.4+)*	number (mm)	read-only (null)	The depth of the chassis.
Drives *(v1.14+)* {	object		The link to the collection of drives within this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
EnvironmentalClass *(v1.9+)*	string (enum)	read-only (null)	The ASHRAE Environmental Class for this chassis. *For the possible property values, see*

			EnvironmentalClass in Property details.
HeightMm *(v1.4+)*	number (mm)	read-only (null)	The height of the chassis.
IndicatorLED *(deprecated v1.14)*	string (enum)	read-write (null)	The state of the indicator LED, which identifies the chassis. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.14 and later. This property has been deprecated in favor of the LocationIndicatorActive property.*
Links {	object		The links to other resources that are related to this resource.
ComputerSystems [{	array		An array of links to the computer systems that this chassis directly and wholly contains.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
ComputerSystems@odata.count	integer	read-only	The number of items in a collection.
ContainedBy {	object		The link to the chassis that contains this chassis.
@odata.id }	string	read-write	*Link to another Chassis resource.*
Contains [{	array		An array of links to any other chassis that this chassis has in it.
@odata.id }]	string	read-write	*Link to another Chassis resource.*
Contains@odata.count	integer	read-only	The number of items in a collection.
CooledBy [{	array		An array of links to resources or objects that cool this chassis. Normally, the link is for either a chassis or a specific set of fans.

@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
CooledBy@odata.count	integer	read-only	The number of items in a collection.
Drives *(v1.2+)* [{	array		An array of links to the drives located in this chassis.
@odata.id }]	string	read-only	*Link to a Drive resource. See the Links section and the Drive schema for details.*
Drives@odata.count	integer	read-only	The number of items in a collection.
Facility *(v1.11+)* {	object		The link to the facility that contains this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
ManagedBy [{	array		An array of links to the managers responsible for managing this chassis.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
ManagedBy@odata.count	integer	read-only	The number of items in a collection.
ManagersInChassis *(v1.2+)* [{	array		An array of links to the managers located in this chassis.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
ManagersInChassis@odata.count	integer	read-only	The number of items in a collection.
Oem { }	object		The OEM extension property. *See the Resource schema for details on this property.*
PCIeDevices *(v1.4+, deprecated v1.10)* [{	array		An array of links to the PCIe devices located in this chassis. *Deprecated in v1.10 and later. This property has been deprecated in favor of the*

			PCIeDevices resource collection in the root of this resource.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
PCIeDevices@odata.count	integer	read-only	The number of items in a collection.
PoweredBy [{	array		An array of links to resources or objects that power this chassis. Normally, the link is for either a chassis or a specific set of power supplies.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
PoweredBy@odata.count	integer	read-only	The number of items in a collection.
Processors *(v1.9+)* [{	array		An array of links to the processors located in this chassis.
@odata.id }]	string	read-only	*Link to a Processor resource. See the Links section and the Processor schema for details.*
Processors@odata.count	integer	read-only	The number of items in a collection.
ResourceBlocks *(v1.5+)* [{	array		An array of links to the resource blocks located in this chassis.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
ResourceBlocks@odata.count	integer	read-only	The number of items in a collection.
Storage *(v1.2+)* [{	array		An array of links to the storage subsystems connected to or inside this chassis.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
Storage@odata.count	integer	read-only	The number of items in a collection.
Switches *(v1.7+)* [{	array		An array of links to the switches located in this

			chassis.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
Switches@odata.count }	integer	read-only	The number of items in a collection.
Location *(v1.2+)* { }	object		The location of the chassis. *See the Resource schema for details on this property.*
LocationIndicatorActive *(v1.14+)*	boolean	read-write (null)	An indicator allowing an operator to physically locate this resource.
LogServices {	object		The link to the logs for this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
Manufacturer	string	read-only (null)	The manufacturer of this chassis.
MaxPowerWatts *(v1.12+)*	number (Watts)	read-only (null)	The upper bound of the total power consumed by the chassis.
MediaControllers *(v1.11+)* {	object		The link to the collection of media controllers located in this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
Memory *(v1.11+)* {	object		The link to the collection of memory located in this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
MemoryDomains *(v1.11+)* {	object		The link to the collection of memory domains located in this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
MinPowerWatts *(v1.12+)*	number (Watts)	read-only (null)	The lower bound of the total power consumed by the chassis.

Model	string	read-only (null)	The model number of the chassis.
NetworkAdapters *(v1.4+)* {	object		The link to the collection of network adapters associated with this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
PartNumber	string	read-only (null)	The part number of the chassis.
PCIeDevices *(v1.10+)* {	object		The link to the collection of PCIe devices located in this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
PCIeSlots *(v1.8+)* {	object		The link to the PCIe slot properties for this chassis.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
PhysicalSecurity *(v1.1+)* {	object		The state of the physical security sensor.
IntrusionSensor *(v1.1+)*	string (enum)	read-write (null)	This indicates the known state of the physical security sensor, such as if it is hardware intrusion detected. *For the possible property values, see IntrusionSensor in Property details.*
IntrusionSensorNumber *(v1.1+)*	integer	read-only (null)	A numerical identifier to represent the physical security sensor.
IntrusionSensorReArm *(v1.1+)* }	string (enum)	read-only (null)	The method that restores this physical security sensor to the normal state. *For the possible property values, see IntrusionSensorReArm in Property details.*
Power *(deprecated v1.15)* {	object		The link to the power properties, or power

			supplies, power policies, and sensors, for this chassis. *Deprecated in v1.15 and later. This link has been deprecated in favor of the PowerSubsystem link property.*
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
PowerState *(v1.0.1+)*	string (enum)	read-only (null)	The current power state of the chassis. *For the possible property values, see PowerState in Property details.*
PowerSubsystem *(v1.15+)* {	object		The link to the power subsystem properties for this chassis. *See the PowerSubsystem schema for details on this property.*
@odata.id }	string	read-only	*Link to a PowerSubsystem resource. See the Links section and the PowerSubsystem schema for details.*
Sensors *(v1.9+)* {	object		The link to the collection of sensors located in the equipment and sub-components.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
SerialNumber	string	read-only (null)	The serial number of the chassis.
SKU	string	read-only (null)	The SKU of the chassis.
Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*
Thermal *(deprecated v1.15)* {	object		The link to the thermal properties, such as

			fans, cooling, and sensors, for this chassis. *Deprecated in v1.15 and later. This link has been deprecated in favor of the ThermalSubsystem link property.*
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
ThermalSubsystem *(v1.15+)* {	object		The link to the thermal subsystem properties for this chassis. *See the ThermalSubsystem schema for details on this property.*
@odata.id }	string	read-only	*Link to a ThermalSubsystem resource. See the Links section and the ThermalSubsystem schema for details.*
UUID *(v1.7+)*	string	read-only (null)	The UUID for this chassis.
WeightKg *(v1.4+)*	number (kg)	read-only (null)	The weight of the chassis.
WidthMm *(v1.4+)*	number (mm)	read-only (null)	The width of the chassis.

43 # Actions

44 ## Reset

45 This action resets the chassis but does not reset systems or other contained resources, although side effects might occur that affect those resources.

Action URI: {Base URI of target resource}/Actions/Chassis.Reset

46 Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
ResetType }	string (enum)	optional	The type of reset. *For the possible property values, see ResetType in Property details.*

47 # Property details

48 ## ChassisType:

49 The type of physical form factor of the chassis.

string	Description
Blade	An enclosed or semi-enclosed, typically vertically-oriented, system chassis that must be plugged into a multi-system chassis to function normally.
Card	A loose device or circuit board intended to be installed in a system or other enclosure.
Cartridge	A small self-contained system intended to be plugged into a multi-system chassis.
Component	A small chassis, card, or device that contains devices for a particular subsystem or function.
Drawer	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that can be slid into a multi-system chassis.
Enclosure	A generic term for a chassis that does not fit any other description.
Expansion	A chassis that expands the capabilities or capacity of another chassis.
IPBasedDrive *(v1.3+)*	A chassis in a drive form factor with IP-based network connections.
Module	A small, typically removable, chassis or card that contains devices for a particular subsystem or function.
Other	A chassis that does not fit any of these definitions.
Pod	A collection of equipment racks in a large, likely transportable, container.
Rack	An equipment rack, typically a 19-inch wide freestanding unit.
RackGroup *(v1.4+)*	A group of racks that form a single entity or share infrastructure.
RackMount	A single-system chassis designed specifically for mounting in an equipment rack.
Row	A collection of equipment racks.
Shelf	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that must be plugged into a multi-system chassis to function normally.
Sidecar	A chassis that mates mechanically with another chassis to expand its capabilities or capacity.
Sled	An enclosed or semi-enclosed, system chassis that must be

string	Description
	plugged into a multi-system chassis to function normally similar to a blade type chassis.
StandAlone	A single, free-standing system, commonly called a tower or desktop chassis.
StorageEnclosure *(v1.6+)*	A chassis that encloses storage.
Zone	A logical division or portion of a physical chassis that contains multiple devices or systems that cannot be physically separated.

50 ## EnvironmentalClass:

51 The ASHRAE Environmental Class for this chassis.

string	Description
A1	ASHRAE Environmental Class 'A1'.
A2	ASHRAE Environmental Class 'A2'.
A3	ASHRAE Environmental Class 'A3'.
A4	ASHRAE Environmental Class 'A4'.

52 ## IndicatorLED:

53 The state of the indicator LED, which identifies the chassis.

string	Description
Blinking	The indicator LED is blinking.
Lit	The indicator LED is lit.
Off	The indicator LED is off.
Unknown *(deprecated v1.2)*	The state of the indicator LED cannot be determined. *This value has been deprecated in favor of returning null if the state is unknown.*

54 ## IntrusionSensor:

55 This indicates the known state of the physical security sensor, such as if it is hardware intrusion detected.

string	Description
HardwareIntrusion	A door, lock, or other mechanism protecting the internal system hardware from being accessed is detected to be in an insecure state.
Normal	No abnormal physical security condition is detected at this time.

string	Description
TamperingDetected	Physical tampering of the monitored entity is detected.

IntrusionSensorReArm:

The method that restores this physical security sensor to the normal state.

string	Description
Automatic	Because no abnormal physical security condition is detected, this sensor is automatically restored to the normal state.
Manual	A manual re-arm of this sensor restores it to the normal state.

PowerState:

The current power state of the chassis.

string	Description
Off	The components within the chassis have no power, except some components might continue to have AUX power, such as the management controller.
On	The components within the chassis have power.
PoweringOff	A temporary state between on and off. The components within the chassis can take time to process the power off action.
PoweringOn	A temporary state between off and on. The components within the chassis can take time to process the power on action.

ResetType:

The type of reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown).
ForceOn	Turn on the unit immediately.
ForceRestart	Shut down immediately and non-gracefully and restart the system.
GracefulRestart	Shut down gracefully and restart the system.
GracefulShutdown	Shut down gracefully and power off.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system.
On	Turn on the unit.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource.

string	Description
PushPowerButton	Simulate the pressing of the physical power button on this unit.

62 ## Example response


```
{
    "@odata.id": "/redfish/v1/Chassis/1U",
    "@odata.type": "#Chassis.v1_15_0.Chassis",
    "Id": "1U",
    "Name": "Computer System Chassis",
    "ChassisType": "RackMount",
    "AssetTag": "Chicago-45Z-2381",
    "Manufacturer": "Contoso",
    "Model": "3500RX",
    "SKU": "8675309",
    "SerialNumber": "437XR1138R2",
    "PartNumber": "224071-J23",
    "PowerState": "On",
    "LocationIndicatorActive": true,
    "Location": {
        "Placement": {
            "Row": "North",
            "Rack": "WEB43",
            "RackOffsetUnits": "EIA_310",
            "RackOffset": 12
        }
    },
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "HeightMm": 44.45,
    "WidthMm": 431.8,
    "DepthMm": 711,
    "WeightKg": 15.31,
    "EnvironmentalClass": "A3",
    "Sensors": {
        "@odata.id": "/redfish/v1/Chassis/1U/Sensors"
    },
    "PowerSubsystem": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem"
    },
    "ThermalSubsystem": {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem"
    },
    "Links": {
        "ComputerSystems": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2"
```

```
            }
        ],
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
        ],
        "ManagersInChassis": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
        ],
        "Oem": {}
    },
    "Oem": {},
    "@Redfish.Copyright": "Copyright 2018-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```


63 # CoolingMetrics 1.0.0

v1.0
TBD

64 The CoolingMetrics schema represents the cooling metrics of a chassis.

65 ## URIs:

/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem/CoolingMetrics

FanPercentSummary [{	array (excerpt)		The summary of the fan readings for this chassis. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
DeviceName *(v1.2+)*	string	read-only (null)	The name of the device.
PhysicalContext	string (enum)	read-only (null)	The area or device to which this sensor measurement applies. *For the possible property values, see PhysicalContext in Property details.*
PhysicalSubContext	string (enum)	read-only (null)	The usage or location within a device to which this sensor measurement applies. *For the possible property values, see PhysicalSubContext in Property details.*

Reading	number	read-only (null)	The sensor value.
SpeedRPM *(v1.2+)* }]	number (RPM)	read-only (null)	The rotational speed.

66 # Actions

67 ## ResetMetrics

68 This action resets the summary metrics related to this equipment.

Action URI: {Base URI of target resource}/Actions/CoolingMetrics.ResetMetrics

69 Perform the action using a POST to the specific Action URI for this resource. This action takes no parameters.

70 # Property details

71 ## PhysicalContext:

72 The area or device to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the

string	Description
	chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

PhysicalSubContext:

The usage or location within a device to which this sensor measurement applies.

string	Description
Input	The input.
Output	The output.

Example response


```
{
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/CoolingMetrics",
    "@odata.type": "#CoolingMetrics.v1_0_0.CoolingMetrics",
    "Name": "Chassis Fan and Liquid Cooling Metrics",
    "FanPercentSummary": [{
            "DeviceName": "Chassis Fan #1",
            "Reading": 45,
            "SpeedRPM": 1900,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/FanBay1"
        },
        {
            "DeviceName": "Chassis Fan #2",
            "Reading": 55,
            "SpeedRPM": 2100,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/FanBay2"
        }
    ],
    "Oem": {},
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```


Drive 1.12.0

v1.12	*v1.11*	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	...
TBD	2020.3	2020.2	2019.4	2019.3	2019.2	2019.1	2018.2	2018.1	2017.3	2017.1	...

The Drive schema represents a single physical drive for a system, including links to associated volumes.

URIs:

/redfish/v1/Chassis/*{ChassisId}*/Drives/*{DriveId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Drives/*{DriveId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Storage/*{StorageId}*/Drives/*{DriveId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*

/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*

Assembly *(v1.3+)* {	object		The link to the assembly associated with this drive.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
AssetTag	string	read-write (null)	The user-assigned asset tag for this drive.
BlockSizeBytes	integer (bytes)	read-only (null)	The size, in bytes, of the smallest addressable unit, or block.
CapableSpeedGbs	number (Gbit/s)	read-only (null)	The speed, in gigabit per second (Gbit/s), at which this drive can communicate to a storage controller in ideal conditions.
CapacityBytes	integer (bytes)	read-only (null)	The size, in bytes, of this drive.
EncryptionAbility	string (enum)	read-only (null)	The encryption ability of this drive. *For the possible property values, see EncryptionAbility in Property details.*
EncryptionStatus	string (enum)	read-only (null)	The status of the encryption of this drive. *For the possible property values, see EncryptionStatus in Property details.*
EnvironmentMetrics *(v1.12+)* {	object		The link to the environment metrics for this drive. *See the EnvironmentMetrics schema for details on this property.*
@odata.id }	string	read-only	*Link to a EnvironmentMetrics resource. See the Links section and the EnvironmentMetrics schema for details.*
FailurePredicted	boolean	read-only (null)	An indication of whether this drive currently predicts a failure in the near future.
HotspareReplacementMode *(v1.5+)*	string (enum)	read-write (null)	The replacement mode for the hot spare drive.

			For the possible property values, see HotspareReplacementMode in Property details.
HotspareType	string (enum)	read-only (null)	The type of hot spare that this drive currently serves as. *For the possible property values, see HotspareType in Property details.*
Identifiers [{ }]	array (object)		The durable names for the drive. Any additional identifiers for a resource. *See the Resource schema for details on this property.*
IndicatorLED *(deprecated v1.11)*	string (enum)	read-write (null)	The state of the indicator LED, that identifies the drive. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.11 and later. This property has been deprecated in favor of the LocationIndicatorActive property.*
Links {	object		The links to other resources that are related to this resource.
Chassis *(v1.2+)* {	object		The link to the chassis that contains this drive. *See the Chassis schema for details on this property.*
@odata.id }	string	read-only	*Link to a Chassis resource. See the Links section and the Chassis schema for details.*
Endpoints *(v1.1+)* [{	array		An array of links to the endpoints that connect to this drive.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
Endpoints@odata.count	integer	read-only	The number of items in a collection.
Oem { }	object		The OEM extension property. *See the Resource schema for details on this property.*
PCIeFunctions *(v1.6+)* [{	array		An array of links to the PCIe functions that the drive produces.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.

PCIeFunctions@odata.count	integer	read-only	The number of items in a collection.
StoragePools *(v1.8+)* [{	array		An array of links to the storage pools to which this drive belongs.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
StoragePools@odata.count	integer	read-only	The number of items in a collection.
Volumes [{	array		An array of links to the volumes that this drive either wholly or only partially contains.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
Volumes@odata.count }	integer	read-only	The number of items in a collection.
Location *(deprecated v1.4)* [{ }]	array (object)		The location of the drive. The location of a resource. *See the Resource schema for details on this property. Deprecated in v1.4 and later. This property has been deprecated in favor of the singular property PhysicalLocation found in Drive.v1_4_0.*
LocationIndicatorActive *(v1.11+)*	boolean	read-write (null)	An indicator allowing an operator to physically locate this resource.
Manufacturer	string	read-only (null)	The manufacturer of this drive.
MediaType	string (enum)	read-only (null)	The type of media contained in this drive. *For the possible property values, see MediaType in Property details.*
Model	string	read-only (null)	The model number for the drive.
Multipath *(v1.9+)*	boolean	read-only (null)	An indication of whether the drive is accessible from multiple paths.
NegotiatedSpeedGbs	number (Gbit/s)	read-only (null)	The speed, in gigabit per second (Gbit/s), at which this drive currently communicates to the storage controller.
Operations *(v1.1+)* [{	array		The operations currently

			running on the Drive.
AssociatedTask *(v1.1+)* {	object		The link to the task associated with the operation, if any.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
OperationName *(v1.1+)*	string	read-only (null)	The name of the operation.
PercentageComplete *(v1.1+)* }]	integer (%)	read-only (null)	The percentage of the operation that has been completed.
PartNumber	string	read-only (null)	The part number for this drive.
PhysicalLocation *(v1.4+)* { }	object		The location of the drive. *See the Resource schema for details on this property.*
PredictedMediaLifeLeftPercent	number (%)	read-only (null)	The percentage of reads and writes that are predicted to be available for the media.
Protocol	string (enum)	read-only (null)	The protocol that this drive currently uses to communicate to the storage controller. *For the possible property values, see Protocol in Property details.*
ReadyToRemove *(v1.10+)*	boolean	read-write (null)	An indication of whether the drive is prepared by the system for removal.
Revision	string	read-only (null)	The revision of this drive. This is typically the firmware or hardware version of the drive.
RotationSpeedRPM	number (RPM)	read-only (null)	The rotation speed of this drive, in revolutions per minute (RPM).
SerialNumber	string	read-only (null)	The serial number for this drive.
SKU	string	read-only (null)	The SKU for this drive.
Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*
StatusIndicator	string (enum)	read-write (null)	The state of the status indicator, which communicates status information about this

			drive. *For the possible property values, see StatusIndicator in Property details.*
WriteCacheEnabled *(v1.7+)*	boolean	read-write (null)	An indication of whether the drive write cache is enabled.

79 # Actions

80 ## Reset *(v1.7+)*

81 This action resets this drive.

Action URI: {Base URI of target resource}/Actions/Drive.Reset

82 Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
ResetType }	string (enum)	optional	The type of reset. *For the possible property values, see ResetType in Property details.*

83 ## SecureErase

84 This action securely erases the contents of the drive.

Action URI: {Base URI of target resource}/Actions/Drive.SecureErase

85 Perform the action using a POST to the specific Action URI for this resource. This action takes no parameters.

86 # Property details

87 ## EncryptionAbility:

88 The encryption ability of this drive.

string	Description
None	The drive is not capable of self-encryption.
Other	The drive is capable of self-encryption through some other means.
SelfEncryptingDrive	The drive is capable of self-encryption per the Trusted Computing Group's Self Encrypting Drive Standard.

89 ## EncryptionStatus:

90 The status of the encryption of this drive.

string	Description
Foreign	The drive is currently encrypted, the data is not accessible to the

string	Description
	user, and the system requires user intervention to expose the data.
Locked	The drive is currently encrypted and the data is not accessible to the user. However, the system can unlock the drive automatically.
Unecrypted *(deprecated v1.1)*	The drive is not currently encrypted. *This value has been deprecated in favor of Unencrypted.*
Unencrypted *(v1.1+)*	The drive is not currently encrypted.
Unlocked	The drive is currently encrypted but the data is accessible to the user in unencrypted form.

91 ## HotspareReplacementMode:

92 The replacement mode for the hot spare drive.

string	Description
NonRevertible	The hot spare drive that is commissioned due to a drive failure remains as a data drive and does not revert to a hot spare if the failed drive is replaced.
Revertible	The hot spare drive that is commissioned due to a drive failure reverts to a hot spare after the failed drive is replaced and rebuilt.

93 ## HotspareType:

94 The type of hot spare that this drive currently serves as.

string	Description
Chassis	The drive is currently serving as a hot spare for all other drives in the chassis.
Dedicated	The drive is currently serving as a hot spare for a user-defined set of drives.
Global	The drive is currently serving as a hot spare for all other drives in the storage system.
None	The drive is not currently a hot spare.

95 ## IndicatorLED:

96 The state of the indicator LED, that identifies the drive.

string	Description
Blinking	The indicator LED is blinking.
Lit	The indicator LED is lit.
Off	The indicator LED is off.

97 ## MediaType:

98 The type of media contained in this drive.

string	Description
HDD	The drive media type is traditional magnetic platters.
SMR	The drive media type is shingled magnetic recording.
SSD	The drive media type is solid state or flash memory.

99 ## Protocol:

100 The protocol that this drive currently uses to communicate to the storage controller.

string	Description
AHCI	Advanced Host Controller Interface (AHCI).
Ethernet	Ethernet.
FC	Fibre Channel.
FCoE	Fibre Channel over Ethernet (FCoE).
FCP	Fibre Channel Protocol for SCSI.
FICON	FIbre CONnection (FICON).
FTP	File Transfer Protocol (FTP).
GenZ	GenZ.
HTTP	Hypertext Transport Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
I2C	Inter-Integrated Circuit Bus.
InfiniBand	InfiniBand.
iSCSI	Internet SCSI.
iWARP	Internet Wide Area RDMA Protocol (iWARP).
MultiProtocol	Multiple Protocols.
NFSv3	Network File System (NFS) version 3.
NFSv4	Network File System (NFS) version 4.
NVMe	Non-Volatile Memory Express (NVMe).
NVMeOverFabrics	NVMe over Fabrics.
OEM	OEM-specific.
PCIe	PCI Express.

string	Description
RoCE	RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2.
SAS	Serial Attached SCSI.
SATA	Serial AT Attachment.
SFTP	SSH File Transfer Protocol (SFTP).
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS).
TCP	Transmission Control Protocol (TCP).
TFTP	Trivial File Transfer Protocol (TFTP).
UDP	User Datagram Protocol (UDP).
UHCI	Universal Host Controller Interface (UHCI).
USB	Universal Serial Bus (USB).

101 ## ResetType:

102 The type of reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown).
ForceOn	Turn on the unit immediately.
ForceRestart	Shut down immediately and non-gracefully and restart the system.
GracefulRestart	Shut down gracefully and restart the system.
GracefulShutdown	Shut down gracefully and power off.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system.
On	Turn on the unit.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource.
PushPowerButton	Simulate the pressing of the physical power button on this unit.

103 ## StatusIndicator:

104 The state of the status indicator, which communicates status information about this drive.

string	Description
Fail	The drive has failed.
Hotspare	The drive has been marked to automatically rebuild and replace a failed drive.
InACriticalArray	The array to which this drive belongs has been degraded.
InAFailedArray	The array to which this drive belongs has failed.
OK	The drive is OK.
PredictiveFailureAnalysis	The drive still works but is predicted to fail soon.
Rebuild	The drive is being rebuilt.

105 ## Example response


```
{
    "@odata.type": "#Drive.v1_9_0.Drive",
    "Id": "3D58ECBC375FD9F2",
    "Name": "Drive Sample",
    "IndicatorLED": "Lit",
    "Model": "C123",
    "Revision": "100A",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "CapacityBytes": 899527000000,
    "FailurePredicted": false,
    "Protocol": "SAS",
    "MediaType": "HDD",
    "Manufacturer": "Contoso",
    "SerialNumber": "1234568",
    "PartNumber": "C123-1111",
    "Identifiers": [
        {
            "DurableNameFormat": "NAA",
            "DurableName": "32ADF365C6C1B7BD"
        }
    ],
    "HotspareType": "None",
    "EncryptionAbility": "SelfEncryptingDrive",
    "EncryptionStatus": "Unlocked",
    "RotationSpeedRPM": 15000,
    "BlockSizeBytes": 512,
    "CapableSpeedGbs": 12,
    "NegotiatedSpeedGbs": 12,
    "Links": {
```

```
        "Volumes": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes/2"
            },
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Volumes/3"
            }
        ]
    },
    "Actions": {
        "#Drive.SecureErase": {
            "target": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/
3D58ECBC375FD9F2/Actions/Drive.SecureErase"
        }
    },
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Storage/1/Drives/3D58ECBC375FD9F2"
}
```


106 # EnvironmentMetrics 1.0.0

v1.0
TBD

107 The EnvironmentMetrics schema represents the environmental metrics of a device.

108 ## URIs:

/redfish/v1/Chassis/*{ChassisId}*/Drives/*{DriveId}*/EnvironmentMetrics

/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*/EnvironmentMetrics

/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/EnvironmentMetrics

/redfish/v1/Systems/*{ComputerSystemId}*/Storage/*{StorageId}*/Drives/*{DriveId}*/Environment Metrics

EnergyJoules {	object (excerpt)		The energy consumption of this device. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
LifetimeReading *(v1.1+)*	number	read-only (null)	The total accumulation value for this sensor.
Reading	number	read-only (null)	The sensor value.
SensorResetTime }	string (date-time)	read-only (null)	The date and time when the time-based properties were last reset.

FanSpeedPercent {	object (excerpt)		The speed of the fan dedicated to this device. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading	number	read-only (null)	The sensor value.
SpeedRPM *(v1.2+)* }	number (RPM)	read-only (null)	The rotational speed.
PowerWatts {	object (excerpt)		The internal power of the device. PROPOSAL: A single power sensor reading is provided for a device. This is the simplest approach and covers most device use cases. For those devices with multiple sensors, this reading would represent the most important sensor, such as the highest reported value. The implementation could change reporting to a different sensor depending on conditions, by using a different `DataSourceUri`. That would require client software to check the `DataSourceUri` value to ensure other Sensor properties, such as thresholds, are reported consistently. Power sensor readings not covered by this property would still be available in the Sensor collection, and could be surfaced in this resource using OEM extensions if necessary. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
ApparentVA	number (V.A)	read-only (null)	The product of voltage and current for an AC circuit, in Volt-Ampere units.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
PowerFactor	number	read-only (null)	The power factor for this sensor.
ReactiveVAR	number (V.A)	read-only (null)	The square root of the difference term of squared ApparentVA and squared Power (Reading) for a circuit, in var units.
Reading }	number	read-only (null)	The sensor value.
TemperatureCelsius {	object (excerpt)		The temperature of the device. PROPOSAL: A single temperature sensor reading is provided for a device.

			This is the simplest approach and covers most device use cases easily. For those devices with multiple sensors, this reading would represent the most important sensor, such as the highest reported value. The implementation could change reporting to a different sensor depending on conditions, by using a different `DataSourceUri`. That would require client software to check the `DataSourceUri` value to ensure other Sensor properties, such as thresholds, are reported consistently. Temperature sensor readings not covered by this property would still be available in the Sensor collection, and could be surfaced in this resource using OEM extensions if necessary. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading }	number	read-only (null)	The sensor value.

109 # Actions

110 ## ResetMetrics

111 This action resets the summary metrics related to this equipment.

Action URI: {Base URI of target resource}/Actions/ EnvironmentMetrics.ResetMetrics

112 Perform the action using a POST to the specific Action URI for this resource. This action takes no parameters.

113 # Example response


```
{
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/1/EnvironmentMetrics",
    "@odata.type": "#EnvironmentMetrics.v1_0_0.EnvironmentMetrics",
    "Name": "Processor Environment Metrics",
    "TemperatureCelsius": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Temp",
        "Reading": 44
    },
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Power",
        "Reading": 12.87
    },
    "FanSpeedPercent": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Fan",
```

```
        "Reading": 80
    },
    "Oem": {},
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```


Fan 1.0.0

v1.0
TBD

The Fan schema describes a cooling fan unit for a computer system or similar devices contained within a chassis.

URIs:

/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem/Fans/*{FanId}*

Assembly {	object		The link to the assembly associated with this fan.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
HotPluggable	boolean	read-only (null)	An indication of whether this device can be inserted or removed while the equipment is in operation.
Location { }	object		The location of the fan. *See the Resource schema for details on this property.*
LocationIndicatorActive	boolean	read-write (null)	An indicator allowing an operator to physically locate this resource.
Manufacturer	string	read-only (null)	The manufacturer of this fan.
Model	string	read-only (null)	The model number for this fan.
PartNumber	string	read-only (null)	The part number for this fan.
PhysicalContext	string (enum)	read-only	The area or device associated with this fan. *For the possible property values, see PhysicalContext in Property details.*
SerialNumber	string	read-only (null)	The serial number for this fan.

SparePartNumber	string	read-only (null)	The spare part number for this fan.
SpeedPercent {	object (excerpt)		The fan speed reading. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading	number	read-only (null)	The sensor value.
SpeedRPM *(v1.2+)* }	number (RPM)	read-only (null)	The rotational speed.
Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*

117 # Property details

118 ## PhysicalContext:

119 The area or device associated with this fan.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.

string	Description
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.

string	Description
VoltageRegulator	A voltage regulator device.

Example response

```
{
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay1",
    "@odata.type": "#Fan.v1_0_0.Fan",
    "Id": "Bay1",
    "Name": "Fan Bay 1",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "PhysicalContext": "Chassis",
    "Model": "RKS-440DC",
    "Manufacturer": "Contoso Fans",
    "PartNumber": "23456-133",
    "SparePartNumber": "93284-133",
    "LocationIndicatorActive": true,
    "HotPluggable": true,
    "SpeedPercent": {
        "Reading": 45,
        "SpeedRPM": 2200,
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/FanBay1"
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Chassis Fan Bay 1",
            "LocationType": "Bay",
            "LocationOrdinalValue": 0
        }
    },
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```

Memory 1.11.0

v1.11	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	...
TBD	2020.3	2019.4	2019.2	2018.3	2018.2	2018.1	2017.3	2017.2	2017.1	2016.3	...

The Memory schema represents a memory device, such as a DIMM, and its configuration.

123 **URIs:**

/redfish/v1/Chassis/*{ChassisId}*/Memory/*{MemoryId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Memory/*{MemoryId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*

/redfish/v1/Systems/*{ComputerSystemId}*/Memory/*{MemoryId}*

AllocationAlignmentMiB *(v1.2+)*	integer (mebibytes)	read-only (null)	The boundary that memory region allocated on, measured in mebiby
AllocationIncrementMiB *(v1.2+)*	integer (mebibytes)	read-only (null)	The size of the smallest unit of all a memory region in mebibytes (M
AllowedSpeedsMHz [ ]	array (MHz) (integer)	read-only	Speeds supported by this memory
Assembly *(v1.4+)* {	object		The link to the assembly resource with this memory device.
@odata.id }	string (URI)	read-only	The unique identifier for a resourc
BaseModuleType	string (enum)	read-only (null)	The base module type of the mem *For the possible property values, BaseModuleType in Property deta*
BusWidthBits	integer	read-only (null)	The bus width, in bits.
CacheSizeMiB *(v1.4+)*	integer (mebibytes)	read-only (null)	Total size of the cache portion me MiB.
CapacityMiB	integer (mebibytes)	read-only (null)	Memory capacity in mebibytes (M
ConfigurationLocked *(v1.7+)*	boolean	read-only (null)	An indication of whether the confi this memory device is locked and altered.
DataWidthBits	integer	read-only (null)	Data width in bits.
DeviceID *(deprecated v1.3)*	string	read-only (null)	Device ID. *Deprecated in v1.3 an property has been deprecated in ModuleProductID.*
DeviceLocator *(deprecated v1.9)*	string	read-only (null)	Location of the memory device in platform. *Deprecated in v1.9 and property has been deprecated in ServiceLabel property within Loca*
EnvironmentMetrics *(v1.11+)* {	object		The link to the environment metric memory.

			See the EnvironmentMetrics sche details on this property.
@odata.id }	string	read-only	*Link to a EnvironmentMetrics reso the Links section and the EnvironmentMetrics schema for d*
ErrorCorrection	string (enum)	read-only (null)	Error correction scheme supporte memory device. *For the possible property values, ErrorCorrection in Property details*
FirmwareApiVersion	string	read-only (null)	Version of API supported by the fi
FirmwareRevision	string	read-only (null)	Revision of firmware on the memo controller.
FunctionClasses *(deprecated v1.3)* [ ]	array (string)	read-only	Function classes by the memory c *Deprecated in v1.3 and later. This has been deprecated in favor of OperatingMemoryModes at the ro resource, or MemoryClassification within RegionSet.*
IsRankSpareEnabled	boolean	read-only (null)	An indication of whether rank spa enabled for this memory device.
IsSpareDeviceEnabled	boolean	read-only (null)	An indication of whether a spare c enabled for this memory device.
Links *(v1.2+)* {	object		The links to other resources that a to this resource.
Chassis *(v1.2+)* {	object		The link to the chassis that contai memory device. *See the Chassis schema for deta property.*
@odata.id }	string	read-only	*Link to a Chassis resource. See t section and the Chassis schema f*
Oem { } }	object		The OEM extension property. *See the Resource schema for det property.*
Location *(v1.4+)* { }	object		The location of the memory devic *See the Resource schema for det property.*
LocationIndicatorActive *(v1.10+)*	boolean	read-write (null)	An indicator allowing an operator physically locate this resource.
LogicalSizeMiB *(v1.4+)*	integer (mebibytes)	read-only (null)	Total size of the logical memory in
Manufacturer	string	read-only (null)	The memory device manufacturer
MaxTDPMilliWatts [ ]	array	read-only	Set of maximum power budgets s

	(milliWatts) (integer)		by the memory device in milliwatts
MemoryDeviceType	string (enum)	read-only (null)	Type details of the memory device *For the possible property values, MemoryDeviceType in Property d*
MemoryLocation {	object		Memory connection information to and memory controllers.
Channel	integer	read-only (null)	The channel number to which the device is connected.
MemoryController	integer	read-only (null)	The memory controller number to memory device is connected.
Slot	integer	read-only (null)	The slot number to which the mem is connected.
Socket }	integer	read-only (null)	The socket number to which the m device is connected.
MemoryMedia [ ]	array (string (enum))	read-only	Media of this memory device. *For the possible property values, MemoryMedia in Property details.*
MemorySubsystemControllerManufacturerID *(v1.3+)*	string	read-only (null)	The manufacturer ID of the memo subsystem controller of this memo
MemorySubsystemControllerProductID *(v1.3+)*	string	read-only (null)	The product ID of the memory sub controller of this memory device.
MemoryType	string (enum)	read-only (null)	The type of memory device. *For the possible property values, MemoryType in Property details.*
Metrics {	object		The link to the metrics associated memory device.
@odata.id }	string (URI)	read-only	The unique identifier for a resourc
ModuleManufacturerID *(v1.3+)*	string	read-only (null)	The manufacturer ID of this memo
ModuleProductID *(v1.3+)*	string	read-only (null)	The product ID of this memory de
NonVolatileSizeMiB *(v1.4+)*	integer (mebibytes)	read-only (null)	Total size of the non-volatile portio in MiB.
OperatingMemoryModes [ ]	array (string (enum))	read-only	Memory modes supported by the device. *For the possible property values, OperatingMemoryModes in Prope*
OperatingSpeedMhz	integer (MHz)	read-only (null)	Operating speed of the memory d MHz or MT/s as appropriate.
PartNumber	string	read-only	The product part number of this d

		(null)	
PersistentRegionNumberLimit *(v1.2+)*	integer	read-only (null)	Total number of persistent regions memory device can support.
PersistentRegionSizeLimitMiB	integer (mebibytes)	read-only (null)	Total size of persistent regions in (MiB).
PersistentRegionSizeMaxMiB *(v1.2+)*	integer (mebibytes)	read-only (null)	Maximum size of a single persiste mebibytes (MiB).
PowerManagementPolicy {	object		Power management policy inform
AveragePowerBudgetMilliWatts	integer (milliWatts)	read-only (null)	Average power budget, in milliwat
MaxTDPMilliWatts	integer (milliWatts)	read-only (null)	Maximum TDP in milliwatts.
PeakPowerBudgetMilliWatts	integer (milliWatts)	read-only (null)	Peak power budget, in milliwatts.
PolicyEnabled }	boolean	read-only (null)	An indication of whether the powe management policy is enabled.
RankCount	integer	read-only (null)	Number of ranks available in the m device.
Regions [{	array		Memory regions information within memory device.
MemoryClassification	string (enum)	read-only (null)	The classification of memory that memory region occupies. *For the possible property values, MemoryClassification in Property*
OffsetMiB	integer (mebibytes)	read-only (null)	Offset within the memory that corr the start of this memory region in (MiB).
PassphraseEnabled *(v1.5+)*	boolean	read-only (null)	An indication of whether the passp enabled for this region.
PassphraseState *(deprecated v1.5)*	boolean	read-only (null)	An indication of whether the state passphrase for this region is enab *Deprecated in v1.5 and later. This has been deprecated in favor of PassphraseEnabled found within*
RegionId	string	read-only (null)	Unique region ID representing a s region within the memory device.
SizeMiB }]	integer (mebibytes)	read-only (null)	Size of this memory region in meb (MiB).
SecurityCapabilities {	object		Security capabilities of the memor
ConfigurationLockCapable *(v1.7+)*	boolean	read-only (null)	An indication of whether this mem supports the locking, or freezing, configuration.

DataLockCapable *(v1.7+)*	boolean	read-only (null)	An indication of whether this mem supports data locking.
MaxPassphraseCount	integer	read-only (null)	Maximum number of passphrases for this memory device.
PassphraseCapable	boolean	read-only (null)	An indication of whether the mem is passphrase capable.
PassphraseLockLimit *(v1.7+)*	integer	read-only (null)	The maximum number of incorrec passphrase attempts allowed befo device is locked.
SecurityStates *(deprecated v1.7)* [ ] }	array (string (enum))	read-only	Security states supported by the r device. *For the possible property values, SecurityStates in Property details Deprecated in v1.7 and later. This has been deprecated in favor of u individual PassphraseCapable, DataLockCapable and ConfigurationLockCapable proper*
SecurityState *(v1.7+)*	string (enum)	read-write (null)	The current security state of this r device. *For the possible property values, SecurityState in Property details.*
SerialNumber	string	read-only (null)	The product serial number of this
SpareDeviceCount	integer	read-only (null)	Number of unused spare devices the memory device.
Status *(v1.1+)* { }	object		The status and health of the resou subordinate or dependent resourc *See the Resource schema for det property.*
SubsystemDeviceID *(deprecated v1.3)*	string	read-only (null)	Subsystem device ID. *Deprecated and later. This property has been in favor of MemorySubsystemControllerProd*
SubsystemVendorID *(deprecated v1.3)*	string	read-only (null)	SubSystem vendor ID. *Deprecate and later. This property has been in favor of MemorySubsystemControllerMan*
VendorID *(deprecated v1.3)*	string	read-only (null)	Vendor ID. *Deprecated in v1.3 an This property has been deprecate of ModuleManufacturerID.*
VolatileRegionNumberLimit *(v1.2+)*	integer	read-only (null)	Total number of volatile regions th device can support.
VolatileRegionSizeLimitMiB	integer (mebibytes)	read-only (null)	Total size of volatile regions in me (MiB).
VolatileRegionSizeMaxMiB *(v1.2+)*	integer	read-only	Maximum size of a single volatile

	(mebibytes)	(null)	mebibytes (MiB).
VolatileSizeMiB *(v1.4+)*	integer (mebibytes)	read-only (null)	Total size of the volatile portion m MiB.

124 # Actions

125 ## DisablePassphrase

126 Disable passphrase for given regions.

Action URI: {Base URI of target resource}/Actions/Memory.DisablePassphrase

127 Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
Passphrase	string	required	Passphrase for doing the operation.
RegionId	string	required	The memory region ID to which to apply this action.
}			

128 ## OverwriteUnit *(v1.6+)*

129 This contains the action for securely erasing given regions using the NIST SP800-88 Purge: Overwrite.

Action URI: {Base URI of target resource}/Actions/Memory.OverwriteUnit

130 Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
Passphrase	string	required	Passphrase for doing the operation.
RegionId	string	required	The memory region ID to which to apply this action.
}			

131 ## Reset *(v1.8+)*

132 This action resets this memory device.

Action URI: {Base URI of target resource}/Actions/Memory.Reset

133 Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
ResetType	string (enum)	optional	The type of reset. *For the possible property values, see ResetType in Property details.*
}			

134 ## SecureEraseUnit

135 This contains the action for securely erasing given regions using the NIST SP800-88 Purge: Cryptographic Erase.

Action URI: {Base URI of target resource}/Actions/Memory.SecureEraseUnit

Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
Passphrase	string	required	Passphrase for doing the operation.
RegionId }	string	required	The memory region ID to which to apply this action.

SetPassphrase

Set passphrase for the given regions.

Action URI: {Base URI of target resource}/Actions/Memory.SetPassphrase

Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
Passphrase	string	required	Passphrase for doing the operation.
RegionId }	string	required	The memory region ID to which to apply this action.

UnlockUnit

This contains the action for unlocking given regions.

Action URI: {Base URI of target resource}/Actions/Memory.UnlockUnit

Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
Passphrase	string	required	The passphrase required to complete the operation.
RegionId }	string	required	The memory region ID to which to apply this action.

Property details

BaseModuleType:

The base module type of the memory device.

string	Description
Die *(v1.7+)*	A die within a package.
LRDIMM	Load Reduced.
Mini_RDIMM	Mini_RDIMM.

string	Description
Mini_UDIMM	Mini_UDIMM.
RDIMM	Registered DIMM.
SO_DIMM	SO_DIMM.
SO_DIMM_16b	SO_DIMM_16b.
SO_DIMM_32b	SO_DIMM_32b.
SO_RDIMM_72b	SO_RDIMM_72b.
SO_UDIMM_72b	SO_UDIMM_72b.
UDIMM	UDIMM.

146 ## ErrorCorrection:

147 Error correction scheme supported for this memory device.

string	Description
AddressParity	Address parity errors can be corrected.
MultiBitECC	Multibit data errors can be corrected by ECC.
NoECC	No ECC available.
SingleBitECC	Single bit data errors can be corrected by ECC.

148 ## MemoryClassification:

149 The classification of memory that the memory region occupies.

string	Description
Block	Block-accessible memory.
ByteAccessiblePersistent	Byte-accessible persistent memory.
Volatile	Volatile memory.

150 ## MemoryDeviceType:

151 Type details of the memory device.

string	Description
DDR	DDR.
DDR2	DDR2.
DDR2_SDRAM	DDR2 SDRAM.
DDR2_SDRAM_FB_DIMM	DDR2 SDRAM FB_DIMM.

string	Description
DDR2_SDRAM_FB_DIMM_PROBE	DDR2 SDRAM FB_DIMM PROBE.
DDR3	DDR3.
DDR3_SDRAM	DDR3 SDRAM.
DDR4	DDR4.
DDR4_SDRAM	DDR4 SDRAM.
DDR4E_SDRAM	DDR4E SDRAM.
DDR_SDRAM	DDR SDRAM.
DDR_SGRAM	DDR SGRAM.
EDO	EDO.
FastPageMode	Fast Page Mode.
HBM *(v1.7+)*	High Bandwidth Memory.
HBM2 *(v1.7+)*	High Bandwidth Memory 2.
Logical *(v1.4+)*	Logical Non-volatile device.
LPDDR3_SDRAM	LPDDR3 SDRAM.
LPDDR4_SDRAM	LPDDR4 SDRAM.
PipelinedNibble	Pipelined Nibble.
ROM	ROM.
SDRAM	SDRAM.

152 ## MemoryMedia:

153 Media of this memory device.

string	Description
DRAM	DRAM media.
Intel3DXPoint	Intel 3D XPoint media.
NAND	NAND media.
Proprietary	Proprietary media.

154 ## MemoryType:

155 The type of memory device.

string	Description
DRAM	The memory device is comprised of volatile memory.
IntelOptane *(v1.6+)*	The memory device is an Intel Optane Persistent Memory Module.
NVDIMM_F	The memory device is comprised of non-volatile memory.
NVDIMM_N	The memory device is comprised of volatile memory backed by non-volatile memory.
NVDIMM_P	The memory device is comprised of a combination of non-volatile and volatile memory.

156 ## OperatingMemoryModes:

157 Memory modes supported by the memory device.

string	Description
Block	Block-accessible system memory.
PMEM	Persistent memory, byte-accessible through system address space.
Volatile	Volatile memory.

158 ## ResetType:

159 The type of reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown).
ForceOn	Turn on the unit immediately.
ForceRestart	Shut down immediately and non-gracefully and restart the system.
GracefulRestart	Shut down gracefully and restart the system.
GracefulShutdown	Shut down gracefully and power off.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system.
On	Turn on the unit.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource.
PushPowerButton	Simulate the pressing of the physical power button on this unit.

160 ## SecurityState:

161 The current security state of this memory device.

string	Description
Disabled	Secure mode is disabled.
Enabled	Secure mode is enabled and access to the data is allowed.
Frozen *(deprecated v1.7)*	Secure state is frozen and cannot be modified until reset. *This value has been deprecated in favor of using the ConfigurationLocked to indicate that the configuration has been frozen.*
Locked	Secure mode is enabled and access to the data is locked.
Passphraselimit	Number of attempts to unlock the memory exceeded limit.
Unlocked *(deprecated v1.7)*	Secure mode is enabled and access to the data is unlocked. *This value has been deprecated in favor of 'Enabled' to indicate normal security operation.*

SecurityStates:

Security states supported by the memory device.

string	Description
Disabled	Secure mode is disabled.
Enabled	Secure mode is enabled and access to the data is allowed.
Frozen	Secure state is frozen and cannot be modified until reset.
Locked	Secure mode is enabled and access to the data is locked.
Passphraselimit	Number of attempts to unlock the memory exceeded limit.
Unlocked	Secure mode is enabled and access to the data is unlocked.

Example response


```
{
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1",
    "@odata.type": "#Memory.v1_11_0.Memory",
    "Name": "Regular Memory",
    "Id": "1",
    "RankCount": 1,
    "MaxTDPMilliWatts": [
        12000
    ],
    "CapacityMiB": 8192,
    "DataWidthBits": 64,
    "BusWidthBits": 72,
    "ErrorCorrection": "MultiBitECC",
    "MemoryLocation": {
        "Socket": 1,
        "MemoryController": 1,
```

```
        "Channel": 1,
        "Slot": 1
    },
    "MemoryType": "DRAM",
    "MemoryDeviceType": "DDR4",
    "BaseModuleType": "RDIMM",
    "MemoryMedia": [
        "DRAM"
    ],
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Metrics": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1/MemoryMetrics"
    },
    "EnvironmentMetrics": {
        "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1/EnvironmentMetrics"
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Socket 1_A",
            "LocationType": "Socket",
            "LocationOrdinalValue": 0
        }
    },
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```


165 # PowerSubsystem 1.0.0

v1.0
TBD

166 This PowerSubsystem schema contains the definition for the power subsystem of a chassis.

167 ## URIs:

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem

Allocation {	object		Power allocation for this subsystem.
AllocatedWatts	number (Watts)	read-only (null)	The total amount of power that has been allocated or budgeted to this subsystem.

RequestedWatts }	number (Watts)	read-only (null)	The potential power, in watts, that the subsystem requests, which might be higher than the current level being consumed because the requested power includes a budget that the subsystem wants for future use.
CapacityWatts	number (Watts)	read-only (null)	The total amount of power that can be allocated to this subsystem. This value can be either the power supply capacity or the power budget that an upstream chassis assigns to this subsystem.
Metrics {	object		The link to the summary metrics for this subsystem. *See the PowerSubsystemMetrics schema for details on this property.*
@odata.id }	string	read-only	*Link to a PowerSubsystemMetrics resource. See the Links section and the PowerSubsystemMetrics schema for details.*
PowerLimitControlWatts {	object		The power limit control for this chassis.
OperatingMode	string (enum)	read-write (null)	The operating mode of this control. *For the possible property values, see OperatingMode in Property details.*
Reading	number	read-only (null)	The reading for the sensor associated with this control.
SetPoint }	number	read-write (null)	The set point for this control.
PowerSupplies {	object		The link to the collection of power supplies within this subsystem.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
PowerSupplyRedundancy [{	array		The redundancy information for the set of power supplies in this subsystem.
MaxSuppliesSupported	integer	read-only (null)	The maximum number of power supplies supported for this redundancy group.
MinSuppliesNeeded	integer	read-only required (null)	The minimum number of power supplies needed for this group to be redundant.

RedundancySet [{	array	required	The links to the power supplies included in this redundancy set.
@odata.id }]	string	read-only	*Link to a PowerSupply resource. See the Links section and the PowerSupply schema for details.*
RedundancySet@odata.count	integer	read-only	The number of items in a collection.
RedundancyType	string (enum)	read-only required (null)	The redundancy mode of the group. *For the possible property values, see RedundancyType in Property details.*
Status { } }]	object	required	The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*
Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*

168 # Property details

169 ## OperatingMode:

170 The operating mode of this control.

string	Description
Automatic	The control will automatically make adjustments to match the current value of the control to the set point.
Disabled	The control is disabled.
Manual	The control will make adjustments to the current value when the set point is changed.
Physical	A physical control that can only be monitored through this interface.

171 ## RedundancyType:

172 The redundancy mode of the group.

string	Description
Failover	Failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions.
NotRedundant	The subsystem is not configured in a redundancy mode, either due to configuration or the functionality has been disabled by the user.

string	Description
NPlusM	Multiple units are available and active such that normal operation will continue if one or more units fail.
Sharing	Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail.
Sparing	One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.

173 # Example response


```
{
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright.",
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem",
    "@odata.type": "#PowerSubsystem.v1_0_0.PowerSubsystem",
    "Name": "Power Subsystem for Chassis",
    "CapacityWatts": 2000,
    "PowerLimitControlWatts": {
        "OperatingMode": "Automatic",
        "SetPoint": 450,
        "Reading": 284
    },
    "Allocation": {
        "RequestedWatts": 1500,
        "AllocatedWatts": 1200
    },
    "PowerSupplyRedundancy": [{
        "RedundancyType": "Failover",
        "MaxSuppliesSupported": 2,
        "MinSuppliesNeeded": 1,
        "RedundancySet": [{
                "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/
Bay1"
            },
            {
                "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/
Bay2"
            }
        ],
        "Status": {
            "State": "UnavailableOffline",
            "Health": "OK"
        }
    }],
    "PowerSupplies": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies"
    },
    "Metrics": {
```

```
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/Metrics"
    },
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Oem": {}
}
```


PowerSubsystemMetrics 1.0.0

v1.0
TBD

This PowerSubsystemMetrics schema contains the definition for the metrics of a power subsystem.

URIs:

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/Metrics

EnergykWh {	object (excerpt)		The energy consumption reading for this subsystem. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
LifetimeReading *(v1.1+)*	number	read-only (null)	The total accumulation value for this sensor.
Reading	number	read-only (null)	The sensor value.
SensorResetTime }	string (date-time)	read-only (null)	The date and time when the time-based properties were last reset.
TotalPowerWatts {	object (excerpt)		The total power consumption of the device. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
ApparentVA	number (V.A)	read-only (null)	The product of voltage and current for an AC circuit, in Volt-Ampere units.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
PowerFactor	number	read-only	The power factor for this sensor.

		(null)	
ReactiveVAR	number (V.A)	read-only (null)	The square root of the difference term of squared ApparentVA and squared Power (Reading) for a circuit, in var units.
Reading }	number	read-only (null)	The sensor value.

177 # Actions

178 ## ResetMetrics

179 This action resets the summary metrics related to this equipment.

Action URI: {Base URI of target resource}/Actions/ PowerSubsystemMetrics.ResetMetrics

180 Perform the action using a POST to the specific Action URI for this resource. This action takes no parameters.

181 # Example response


```
{
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/Metrics",
    "@odata.type": "#PowerSubsystemMetrics.v1_0_0.PowerSubsystemMetrics",
    "Id": "PowerMetrics",
    "Name": "Summary Power Metrics",
    "TotalPowerWatts": {
        "Reading": 374,
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/TotalPower"
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/TotalEnergy",
        "Reading": 325675
    },
    "Oem": {},
    "Actions": {
        "#PowerSubsystemMetrics.ResetMetrics": {
            "target": "/redfish/v1/Chassis/1U/PowerSubsystem/Metrics/
PowerSubsystemMetrics.ResetMetrics"
        }
    },
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```

PowerSupply 1.0.0

v1.0
TBD

Details of a power supplies associated with this system or device.

URIs:

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/PowerSupplies/*{PowerSupplyId}*

Assembly {	object		The link to the assembly associated with this power supply.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
EfficiencyRatings [{	array		The rated efficiency of this power supply.
EfficiencyPercent	number (%)	read-only (null)	The rated efficiency of this power supply at the specified load.
LoadPercent }]	number (%)	read-only (null)	The electrical load for this rating.
FirmwareVersion	string	read-only (null)	The firmware version for this power supply.
HotPluggable	boolean	read-only (null)	An indication of whether this device can be inserted or removed while the equipment is in operation.
InputRanges [{	array		The input ranges that the power supply can use.
CapacityWatts	number (Watts)	read-only (null)	The maximum capacity of this power supply when operating in this input range.
MaximumFrequencyHz	number (Hz)	read-only (null)	PROPOSAL: Remove this property as the input range is described by the NominalVoltageType property. The maximum line input frequency at which this power supply input range is effective.
MaximumVoltage	number (Volts)	read-only (null)	PROPOSAL: Remove this property as the input range is described by the NominalVoltageType property. The maximum line input voltage at which this power supply input range is effective.
MinimumFrequencyHz	number (Hz)	read-only (null)	PROPOSAL: Remove this property as the input range is described by the NominalVoltageType property. The minimum line input frequency at which this power supply input range is

			effective.
MinimumVoltage	number (Volts)	read-only (null)	PROPOSAL: Remove this property as the input range is described by the NominalVoltageType property. The minimum line input voltage at which this power supply input range is effective.
NominalVoltageType }]	string (enum)	read-only (null)	The input voltage range. *For the possible property values, see NominalVoltageType in Property details.*
LineInputVoltageType	string (enum)	read-only (null)	The line voltage type supported as an input to this power supply. *For the possible property values, see LineInputVoltageType in Property details.*
Links {	object		The links to other resources that are related to this resource.
Oem { }	object		The OEM extension property. *See the Resource schema for details on this property.*
Outlet {	object		The outlet connected to this power supply.
@odata.id } }	string (URI)	read-only	The unique identifier for a resource.
Location { }	object		The location of the power supply. *See the Resource schema for details on this property.*
LocationIndicatorActive	boolean	read-write (null)	An indicator allowing an operator to physically locate this resource.
Manufacturer	string	read-only (null)	The manufacturer of this power supply.
Metrics {	object		The link to the power supply metrics resource associated with this power supply. *See the PowerSupplyMetrics schema for details on this property.*
@odata.id }	string	read-only	*Link to a PowerSupplyMetrics resource. See the Links section and the PowerSupplyMetrics schema for details.*
Model	string	read-only (null)	The model number for this power supply.
OutputRails [{	array		The output rails provided by this power supply.
NominalVoltage	number	read-only (null)	The nominal output voltage of this power rail.

PhysicalContext }]	string (enum)	read-only	The area or device to which this power rail applies. *For the possible property values, see PhysicalContext in Property details.*
PartNumber	string	read-only (null)	The part number for this power supply.
PhaseWiringType	string (enum)	read-only (null)	The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) provided for the power supply input connector. *For the possible property values, see PhaseWiringType in Property details.*
PlugType	string (enum)	read-only (null)	The type of plug according to NEMA, IEC, or regional standards. *For the possible property values, see PlugType in Property details.*
PowerCapacityWatts	number (Watts)	read-only (null)	The maximum capacity of this power supply.
PowerSupplyType	string (enum)	read-only (null)	The power supply type (AC or DC). *For the possible property values, see PowerSupplyType in Property details.*
SerialNumber	string	read-only (null)	The serial number for this power supply.
SparePartNumber	string	read-only (null)	The spare part number for this power supply.
Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*

185 # Actions

186 ## Reset

187 This action resets the power supply.

Action URI: {Base URI of target resource}/Actions/PowerSupply.Reset

188 Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
ResetType }	string (enum)	optional	The type of reset. *For the possible property values, see ResetType in Property details.*

Property details

LineInputVoltageType:

The line voltage type supported as an input to this power supply.

string	Description
AC100To240V	AC 100-240V nominal.
AC100To277V	AC 100-277V nominal.
AC120V	AC 120V nominal.
AC200To240V	AC 200-240V nominal.
AC200To277V	AC 200-277V nominal.
AC208V	AC 208V nominal.
AC230V	AC 230V nominal.
AC240AndDC380V	AC 200-240V and DC 380V.
AC240V	AC 240V nominal.
AC277AndDC380V	AC 200-277V and DC 380V.
AC277V	AC 277V nominal.
AC400V	AC 400V or 415V nominal.
AC480V	AC 480V nominal.
DC240V	DC 240V nominal.
DC380V	High Voltage DC (380V).
DC50V	DC 50V nominal.
DCNeg48V	-48V DC.

NominalVoltageType:

The input voltage range.

string	Description
AC100To240V	AC 100-240V nominal.
AC100To277V	AC 100-277V nominal.
AC120V	AC 120V nominal.
AC200To240V	AC 200-240V nominal.
AC200To277V	AC 200-277V nominal.

string	Description
AC208V	AC 208V nominal.
AC230V	AC 230V nominal.
AC240AndDC380V	AC 200-240V and DC 380V.
AC240V	AC 240V nominal.
AC277AndDC380V	AC 200-277V and DC 380V.
AC277V	AC 277V nominal.
AC400V	AC 400V or 415V nominal.
AC480V	AC 480V nominal.
DC240V	DC 240V nominal.
DC380V	High Voltage DC (380V).
DC50V	DC 50V nominal.
DCNeg48V	-48V DC.

194 ## PhaseWiringType:

195 The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires) provided for the power supply input connector.

string	Description
OneOrTwoPhase3Wire	Single or Two-Phase / 3-Wire (Line1, Line2 or Neutral, Protective Earth).
OnePhase3Wire	Single-phase / 3-Wire (Line1, Neutral, Protective Earth).
ThreePhase4Wire	Three-phase / 4-Wire (Line1, Line2, Line3, Protective Earth).
ThreePhase5Wire	Three-phase / 5-Wire (Line1, Line2, Line3, Neutral, Protective Earth).
TwoPhase3Wire	Two-phase / 3-Wire (Line1, Line2, Protective Earth).
TwoPhase4Wire	Two-phase / 4-Wire (Line1, Line2, Neutral, Protective Earth).

196 ## PhysicalContext:

197 The area or device to which this power rail applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.

string	Description
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.

string	Description
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

198 ## PlugType:

199 The type of plug according to NEMA, IEC, or regional standards.

string	Description
California_CS8265	California Standard CS8265 (Single-phase 250V; 50A; 2P3W).
California_CS8365	California Standard CS8365 (Three-phase 250V; 50A; 3P4W).
Field_208V_3P4W_60A	Field-wired; Three-phase 200-250V; 60A; 3P4W.
Field_400V_3P5W_32A	Field-wired; Three-phase 200-240/346-415V; 32A; 3P5W.
IEC_60309_316P6	IEC 60309 316P6 (Single-phase 200-250V; 16A; 1P3W; Blue, 6-hour).
IEC_60309_332P6	IEC 60309 332P6 (Single-phase 200-250V; 32A; 1P3W; Blue, 6-hour).
IEC_60309_363P6	IEC 60309 363P6 (Single-phase 200-250V; 63A; 1P3W; Blue, 6-hour).
IEC_60309_460P9	IEC 60309 460P9 (Three-phase 200-250V; 60A; 3P4W; Blue; 9-hour).

string	Description
IEC_60309_516P6	IEC 60309 516P6 (Three-phase 200-240/346-415V; 16A; 3P5W; Red; 6-hour).
IEC_60309_532P6	IEC 60309 532P6 (Three-phase 200-240/346-415V; 32A; 3P5W; Red; 6-hour).
IEC_60309_560P9	IEC 60309 560P9 (Three-phase 120-144/208-250V; 60A; 3P5W; Blue; 9-hour).
IEC_60309_563P6	IEC 60309 563P6 (Three-phase 200-240/346-415V; 63A; 3P5W; Red; 6-hour).
IEC_60320_C14	IEC C14 (Single-phase 250V; 10A; 1P3W).
IEC_60320_C20	IEC C20 (Single-phase 250V; 16A; 1P3W).
NEMA_5_15P	NEMA 5-15P (Single-phase 125V; 15A; 1P3W).
NEMA_5_20P	NEMA 5-20P (Single-phase 125V; 20A; 1P3W).
NEMA_6_15P	NEMA 6-15P (Single-phase 250V; 15A; 2P3W).
NEMA_6_20P	NEMA 6-20P (Single-phase 250V; 20A; 2P3W).
NEMA_L14_20P	NEMA L14-20P (Split-phase 125/250V; 20A; 2P4W).
NEMA_L14_30P	NEMA L14-30P (Split-phase 125/250V; 30A; 2P4W).
NEMA_L15_20P	NEMA L15-20P (Three-phase 250V; 20A; 3P4W).
NEMA_L15_30P	NEMA L15-30P (Three-phase 250V; 30A; 3P4W).
NEMA_L21_20P	NEMA L21-20P (Three-phase 120/208V; 20A; 3P5W).
NEMA_L21_30P	NEMA L21-30P (Three-phase 120/208V; 30A; 3P5W).
NEMA_L22_20P	NEMA L22-20P (Three-phase 277/480V; 20A; 3P5W).
NEMA_L22_30P	NEMA L22-30P (Three-phase 277/480V; 30A; 3P5W).
NEMA_L5_15P	NEMA L5-15P (Single-phase 125V; 15A; 1P3W).
NEMA_L5_20P	NEMA L5-20P (Single-phase 125V; 20A; 1P3W).
NEMA_L5_30P	NEMA L5-30P (Single-phase 125V; 30A; 1P3W).
NEMA_L6_15P	NEMA L6-15P (Single-phase 250V; 15A; 2P3W).
NEMA_L6_20P	NEMA L6-20P (Single-phase 250V; 20A; 2P3W).
NEMA_L6_30P	NEMA L6-30P (Single-phase 250V; 30A; 2P3W).

200 **PowerSupplyType:**

201 The power supply type (AC or DC).

string	Description
AC	Alternating Current (AC) power supply.
ACorDC	The power supply supports both DC or AC.
DC	Direct Current (DC) power supply.
Unknown	The power supply type cannot be determined.

ResetType:

The type of reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown).
ForceOn	Turn on the unit immediately.
ForceRestart	Shut down immediately and non-gracefully and restart the system.
GracefulRestart	Shut down gracefully and restart the system.
GracefulShutdown	Shut down gracefully and power off.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system.
On	Turn on the unit.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource.
PushPowerButton	Simulate the pressing of the physical power button on this unit.

Example response


```
{
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1",
    "@odata.type": "#PowerSupply.v1_0_0.PowerSupply",
    "Id": "Bay1",
    "Name": "Power Supply Bay 1",
    "Status": {
        "State": "Enabled",
        "Health": "Warning"
    },
    "Model": "RKS-440DC",
    "Manufacturer": "Contoso Power",
    "FirmwareVersion": "1.00",
    "SerialNumber": "3488247",
    "PartNumber": "23456-133",
    "SparePartNumber": "93284-133",
```

```
    "LocationIndicatorActive": false,
    "HotPluggable": false,
    "PowerCapacityWatts": 400,
    "PhaseWiringType": "OnePhase3Wire",
    "PlugType": "IEC_60320_C14",
    "InputRanges": [{
            "NominalVoltageType": "AC200To240V",
            "CapacityWatts": 400
        },
        {
            "NominalVoltageType": "AC120V",
            "CapacityWatts": 350
        },
        {
            "NominalVoltageType": "DC380V",
            "CapacityWatts": 400
        }
    ],
    "EfficiencyRatings": [{
            "LoadPercent": 25,
            "EfficiencyPercent": 75
        },
        {
            "LoadPercent": 50,
            "EfficiencyPercent": 85
        },
        {
            "LoadPercent": 90,
            "EfficiencyPercent": 80
        }
    ],
    "OutputRails": [{
            "NominalVoltage": 3.3,
            "PhysicalContext": "SystemBoard"
        },
        {
            "NominalVoltage": 5,
            "PhysicalContext": "SystemBoard"
        },
        {
            "NominalVoltage": 12,
            "PhysicalContext": "StorageDevice"
        }
    ],
    "Location": {
        "PartLocation": {
            "ServiceLabel": "PSU 1",
            "LocationType": "Bay",
            "LocationOrdinalValue": 0
        }
```

```
    },
    "Links": {
        "Outlet": {
            "@odata.id": "https://redfishpdu.contoso.com/redfish/v1/PowerEquipment/
RackPDUs/1/Outlets/A4"
        }
    },
    "Assembly": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/
Assembly"
    },
    "Metrics": {
        "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/
Metrics"
    },
    "Actions": {
        "#PowerSupply.Reset": {
            "target": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/
PowerSupply.Reset"
        }
    },
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```


205 # PowerSupplyMetrics 1.0.0

v1.0
TBD

206 This is the schema definition for the metrics of a power supply.

207 ## URIs:

/redfish/v1/Chassis/*{ChassisId}*/PowerSubsystem/PowerSupplies/*{PowerSupplyId}*/Metrics

EnergykWh {	object (excerpt)		The energy consumption of this unit. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
LifetimeReading *(v1.1+)*	number	read-only (null)	The total accumulation value for this sensor.
Reading	number	read-only (null)	The sensor value.

SensorResetTime }	string (date-time)	read-only (null)	The date and time when the time-based properties were last reset.
FanSpeedPercent {	object (excerpt)		The fan speed reading for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading	number	read-only (null)	The sensor value.
SpeedRPM *(v1.2+)* }	number (RPM)	read-only (null)	The rotational speed.
FrequencyHz {	object (excerpt)		The frequency reading for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading }	number	read-only (null)	The sensor value.
InputCurrentAmps {	object (excerpt)		The input current reading for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
CrestFactor *(v1.1+)*	number	read-only (null)	The crest factor for this sensor.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading	number	read-only (null)	The sensor value.
THDPercent *(v1.1+)* }	number	read-only (null)	The total harmonic distortion (THD).
InputPowerWatts {	object (excerpt)		The input power reading for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
ApparentVA	number (V.A)	read-only (null)	The product of voltage and current for an AC circuit, in Volt-Ampere units.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.

PowerFactor	number	read-only (null)	The power factor for this sensor.
ReactiveVAR	number (V.A)	read-only (null)	The square root of the difference term of squared ApparentVA and squared Power (Reading) for a circuit, in var units.
Reading }	number	read-only (null)	The sensor value.
InputVoltage {	object (excerpt)		The input voltage reading for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
CrestFactor *(v1.1+)*	number	read-only (null)	The crest factor for this sensor.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading	number	read-only (null)	The sensor value.
THDPercent *(v1.1+)* }	number	read-only (null)	The total harmonic distortion (THD).
OutputPowerWatts {	object (excerpt)		The total power output reading for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
ApparentVA	number (V.A)	read-only (null)	The product of voltage and current for an AC circuit, in Volt-Ampere units.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
PowerFactor	number	read-only (null)	The power factor for this sensor.
ReactiveVAR	number (V.A)	read-only (null)	The square root of the difference term of squared ApparentVA and squared Power (Reading) for a circuit, in var units.
Reading }	number	read-only (null)	The sensor value.
RailCurrentAmps [{	array (excerpt)		The current readings for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
CrestFactor *(v1.1+)*	number	read-only (null)	The crest factor for this sensor.

DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading	number	read-only (null)	The sensor value.
THDPercent *(v1.1+)* }]	number	read-only (null)	The total harmonic distortion (THD).
RailPowerWatts [{	array (excerpt)		The power readings for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
ApparentVA	number (V.A)	read-only (null)	The product of voltage and current for an AC circuit, in Volt-Ampere units.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
PowerFactor	number	read-only (null)	The power factor for this sensor.
ReactiveVAR	number (V.A)	read-only (null)	The square root of the difference term of squared ApparentVA and squared Power (Reading) for a circuit, in var units.
Reading }]	number	read-only (null)	The sensor value.
RailVoltage [{	array (excerpt)		The voltage readings for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
CrestFactor *(v1.1+)*	number	read-only (null)	The crest factor for this sensor.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading	number	read-only (null)	The sensor value.
THDPercent *(v1.1+)* }]	number	read-only (null)	The total harmonic distortion (THD).
Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*
TemperatureCelsius {	object (excerpt)		The temperature reading for this power supply. *This object is an excerpt of the Sensor resource located at the URI shown in*

			DataSourceUri.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading }	number	read-only (null)	The sensor value.

208 # Actions

209 ## ResetMetrics

210 This action resets the summary metrics related to this equipment.

Action URI: {Base URI of target resource}/Actions/ PowerSupplyMetrics.ResetMetrics

211 Perform the action using a POST to the specific Action URI for this resource. This action takes no parameters.

212 # Example response


```
{
    "@odata.id": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/Metrics",
    "@odata.type": "#PowerSupplyMetrics.v1_0_0.PowerSupplyMetrics",
    "Id": "Metrics",
    "Name": "Metrics for Power Supply 1",
    "Status": {
        "State": "Enabled",
        "Health": "Warning"
    },
    "InputVoltage": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputVoltage",
        "Reading": 230.2
    },
    "InputCurrentAmps": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputCurrent",
        "Reading": 5.19
    },
    "InputPowerWatts": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputPower",
        "Reading": 937.4
    },
    "RailVoltage": [{
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VOutput",
            "Reading": 3.31
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VOutput",
            "Reading": 5.03
        },
        {
```

```
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12VOutput",
            "Reading": 12.06
        }
    ],
    "RailCurrentAmps": [{
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VCurrent",
            "Reading": 9.84
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VCurrent",
            "Reading": 1.25
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12Current",
            "Reading": 2.58
        }
    ],
    "OutputPowerWatts": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1OutputPower",
        "Reading": 937.4
    },
    "RailPowerWatts": [{
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_3VPower",
            "Reading": 79.84
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_5VPower",
            "Reading": 26.25
        },
        {
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1_12VPower",
            "Reading": 91.58
        }
    ],
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Energy",
        "Reading": 325675
    },
    "FrequencyHz": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1InputFrequency",
        "Reading": 60
    },
    "TemperatureCelsius": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Temp",
        "Reading": 43.9
    },
    "FanSpeedPercent": {
        "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PS1Fan",
        "Reading": 68,
        "SpeedRPM": 3290
```

```
    },
    "Actions": {
        "#PowerSupplyMetrics.ResetMetrics": {
            "target": "/redfish/v1/Chassis/1U/PowerSubsystem/PowerSupplies/Bay1/
Metrics/PowerSupplyMetrics.ResetMetrics"
        }
    },
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```


213 # Processor 1.11.0

v1.11	*v1.10*	*v1.9*	*v1.8*	*v1.7*	*v1.6*	*v1.5*	*v1.4*	*v1.3*	*v1.2*	*v1.1*	...
TBD	2020.3	2020.2	2020.1	2019.4	2019.3	2019.1	2018.3	2018.1	2017.3	2017.1	...

214 The Processor schema describes the information about a single processor that a system contains. A processor includes both performance characteristics, clock speed, architecture, core count, and so on, and compatibility, such as the CPU ID instruction results.

215 ## URIs:

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*

/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*

/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*

AccelerationFunctions *(v1.4+)* {	object		The link to the collection of acceleration functions associated with this processor.
@odata.id	string	read-only	The unique identifier for

}	(URI)		a resource.
AppliedOperatingConfig *(v1.9+)* {	object		The link to the operating configuration that is applied to this processor.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
Assembly *(v1.2+)* {	object		The link to an assembly associated with this processor.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
BaseSpeedMHz *(v1.10+)*	integer (MHz)	read-only (null)	The base (nominal) clock speed of the processor in MHz.
BaseSpeedPriorityState *(v1.9+)*	string (enum)	read-only (null)	The state of the base frequency settings of the operation configuration applied to this processor. *For the possible property values, see BaseSpeedPriorityState in Property details.*
EnvironmentMetrics *(v1.11+)* {	object		The link to the environment metrics for this processor. *See the EnvironmentMetrics schema for details on this property.*
@odata.id }	string	read-only	*Link to a EnvironmentMetrics resource. See the Links section and the EnvironmentMetrics schema for details.*
FirmwareVersion *(v1.7+)*	string	read-only	The firmware version of the processor.
FPGA *(v1.4+)* {	object		The properties for processors of the FPGA type.
ExternalInterfaces *(v1.4+)* [{	array		An array of the FPGA external interfaces.
Ethernet *(v1.4+)* {	object		The Ethernet-related information for this interface.

MaxLanes *(v1.4+)*	integer	read-only (null)	The number of lanes supported by this interface.
MaxSpeedMbps *(v1.4+)*	integer (Mbit/s)	read-only (null)	The maximum speed supported by this interface.
Oem *(v1.4+)* { } }	object		The OEM extension property. *See the Resource schema for details on this property.*
InterfaceType *(v1.4+)*	string (enum)	read-only (null)	The interface type. *For the possible property values, see InterfaceType in Property details.*
PCIe *(v1.4+)* { } }]	object		The PCIe-related information for this interface. *See the PCIeDevice.v1_5_0 schema for details on this property.*
FirmwareId *(v1.4+)*	string	read-only	The FPGA firmware identifier.
FirmwareManufacturer *(v1.4+)*	string	read-only	The FPGA firmware manufacturer.
FirmwareVersion *(v1.4+, deprecated v1.9)*	string	read-only	The FPGA firmware version. *Deprecated in v1.9 and later. This property has been deprecated in favor of the FirmwareVersion property in the root of this resource.*
FpgaType *(v1.4+)*	string (enum)	read-only	The FPGA type. *For the possible property values, see FpgaType in Property details.*
HostInterface *(v1.4+, deprecated v1.8)* {	object		The FPGA interface to the host. *Deprecated in v1.8 and later. This property has been deprecated in favor of the SystemInterface property in the root of this resource.*
Ethernet *(v1.4+)* {	object		The Ethernet-related information for this

			interface.
MaxLanes *(v1.4+)*	integer	read-only (null)	The number of lanes supported by this interface.
MaxSpeedMbps *(v1.4+)*	integer (Mbit/s)	read-only (null)	The maximum speed supported by this interface.
Oem *(v1.4+)* { } }	object		The OEM extension property. *See the Resource schema for details on this property.*
InterfaceType *(v1.4+)*	string (enum)	read-only (null)	The interface type. *For the possible property values, see InterfaceType in Property details.*
PCIe *(v1.4+)* { } }	object		The PCIe-related information for this interface. *See the PCIeDevice.v1_5_0 schema for details on this property.*
Model *(v1.4+)*	string	read-only	The FPGA model.
Oem *(v1.4+)* { }	object		The OEM extension property. *See the Resource schema for details on this property.*
PCIeVirtualFunctions *(v1.4+)*	integer	read-write	The number of the PCIe Virtual Functions.
ProgrammableFromHost *(v1.4+)*	boolean	read-write (null)	An indication of whether the FPGA firmware can be reprogrammed from the host by using system software.
ReconfigurationSlots *(v1.4+)* [{	array		An array of the FPGA reconfiguration slots. An FPGA uses a reconfiguration slot to contain an acceleration function that can change as the FPGA is provisioned.
AccelerationFunction *(v1.4+)* {	object		The link to the acceleration function that the code

			programmed into a reconfiguration slot provides.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
ProgrammableFromHost *(v1.4+)*	boolean	read-write (null)	An indication of whether the reconfiguration slot can be reprogrammed from the host by using system software.
SlotId *(v1.4+)*	string	read-only (null)	The FPGA reconfiguration slot identifier.
UUID *(v1.4+)* }] }	string	read-only (null)	The UUID for this reconfiguration slot.
HighSpeedCoreIDs *(v1.9+)* [ ]	array (integer, null)	read-only	The list of core identifiers corresponding to the cores that have been configured with the higher clock speed from the operating configuration applied to this processor.
InstructionSet	string (enum)	read-only (null)	The instruction set of the processor. *For the possible property values, see InstructionSet in Property details.*
Links *(v1.1+)* {	object		The links to other resources that are related to this resource.
Chassis *(v1.1+)* {	object		The link to the chassis that contains this processor. *See the Chassis schema for details on this property.*
@odata.id }	string	read-only	*Link to a Chassis resource. See the Links section and the Chassis schema for details.*
ConnectedProcessors *(v1.4+)* [{	array		An array of links to the processors directly connected to this processor.

@odata.id }]	string	read-only	*Link to another Processor resource.*
ConnectedProcessors@odata.count	integer	read-only	The number of items in a collection.
Endpoints *(v1.4+)* [{	array		An array of links to the endpoints that connect to this processor.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
Endpoints@odata.count	integer	read-only	The number of items in a collection.
Oem { }	object		The OEM extension property. *See the Resource schema for details on this property.*
PCIeDevice *(v1.4+)* {	object		The link to the PCIe device associated with this processor.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
PCIeFunctions *(v1.4+)* [{	array		An array of links to the PCIeFunctions associated with this processor.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
PCIeFunctions@odata.count }	integer	read-only	The number of items in a collection.
Location *(v1.2+)* { }	object		The location of the processor. *See the Resource schema for details on this property.*
LocationIndicatorActive *(v1.10+)*	boolean	read-write (null)	An indicator allowing an operator to physically locate this resource.
Manufacturer	string	read-only (null)	The processor manufacturer.
MaxSpeedMHz	integer (MHz)	read-only (null)	The maximum clock speed of the processor.
MaxTDPWatts *(v1.4+)*	integer (Watts)	read-only (null)	The maximum Thermal Design Power (TDP) in watts.

Metrics *(v1.4+)* {	object		The link to the metrics associated with this processor. *See the ProcessorMetrics schema for details on this property.*
@odata.id }	string	read-only	*Link to a ProcessorMetrics resource. See the Links section and the ProcessorMetrics schema for details.*
MinSpeedMHz *(v1.8+)*	integer (MHz)	read-only (null)	The minimum clock speed of the processor in MHz.
Model	string	read-only (null)	The product model number of this device.
OperatingConfigs *(v1.9+)* {	object		The link to the collection operating configurations that can be applied to this processor.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
OperatingSpeedMHz *(v1.8+)*	integer (MHz)	read-only (null)	Operating speed of the processor in MHz.
PartNumber *(v1.7+)*	string	read-only (null)	The part number of the processor.
PowerLimitControlWatts *(v1.11+)* {	object		The power limit control for this processor.
OperatingMode *(v1.11+)*	string (enum)	read-write (null)	The operating mode of this control. *For the possible property values, see OperatingMode in Property details.*
Reading *(v1.11+)*	number	read-only (null)	The reading for the sensor associated with this control.
SetPoint *(v1.11+)* }	number	read-write (null)	The set point for this control.
ProcessorArchitecture	string (enum)	read-only (null)	The architecture of the processor. *For the possible property values, see ProcessorArchitecture in Property details.*

ProcessorId {	object		The identification information for this processor.
EffectiveFamily	string	read-only (null)	The effective family for this processor.
EffectiveModel	string	read-only (null)	The effective model for this processor.
IdentificationRegisters	string	read-only (null)	The raw manufacturer-provided processor identification registers for this processor.
MicrocodeInfo	string	read-only (null)	The microcode information for this processor.
ProtectedIdentificationNumber *(v1.10+)*	string	read-only (null)	The Protected Processor Identification Number (PPIN) for this processor.
Step	string	read-only (null)	The step value for this processor.
VendorId }	string	read-only (null)	The vendor identification for this processor.
ProcessorMemory *(v1.4+)* [{	array		The memory directly attached or integrated within this processor.
CapacityMiB *(v1.4+)*	integer (mebibytes)	read-only (null)	The memory capacity in MiB.
IntegratedMemory *(v1.4+)*	boolean	read-only (null)	An indication of whether this memory is integrated within the processor.
MemoryType *(v1.4+)*	string (enum)	read-only (null)	The type of memory used by this processor. *For the possible property values, see MemoryType in Property details.*
SpeedMHz *(v1.4+)* }]	integer	read-only (null)	The operating speed of the memory in MHz.
ProcessorType	string (enum)	read-only (null)	The type of processor. *For the possible property values, see ProcessorType in Property details.*
SerialNumber *(v1.7+)*	string	read-only	The serial number of

		(null)	the processor.
Socket	string	read-only (null)	The socket or location of the processor.
SpeedLimitMHz *(v1.10+)*	integer (MHz)	read-write (null)	The clock limit of the processor in MHz.
SpeedLocked *(v1.10+)*	boolean	read-write (null)	Indicates whether the clock speed of the processor is fixed at the value specified in the SpeedLimitMHz property.
Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*
SubProcessors *(v1.3+)* {	object		The link to the collection of sub-processors associated with this system, such as cores or threads, that are part of a processor.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
SystemInterface *(v1.8+)* {	object		The interface between the system and the processor.
Ethernet *(v1.4+)* {	object		The Ethernet-related information for this interface.
MaxLanes *(v1.4+)*	integer	read-only (null)	The number of lanes supported by this interface.
MaxSpeedMbps *(v1.4+)*	integer (Mbit/s)	read-only (null)	The maximum speed supported by this interface.
Oem *(v1.4+)* { } }	object		The OEM extension property. *See the Resource schema for details on this property.*
InterfaceType *(v1.4+)*	string (enum)	read-only (null)	The interface type. *For the possible property values, see InterfaceType in*

			Property details.
PCIe *(v1.4+)* { } }	object		The PCIe-related information for this interface. *See the PCIeDevice.v1_5_0 schema for details on this property.*
TDPWatts *(v1.4+)*	integer (Watts)	read-only (null)	The nominal Thermal Design Power (TDP) in watts.
TotalCores	integer	read-only (null)	The total number of cores that this processor contains.
TotalEnabledCores *(v1.5+)*	integer	read-only (null)	The total number of enabled cores that this processor contains.
TotalThreads	integer	read-only (null)	The total number of execution threads that this processor supports.
TurboState *(v1.9+)*	string (enum)	read-only (null)	The state of the turbo for this processor. *For the possible property values, see TurboState in Property details.*
UUID *(v1.4+)*	string	read-only (null)	The UUID for this processor.
Version *(v1.7+)*	string	read-only (null)	The hardware version of the processor.

216 # Actions

217 ## Reset *(v1.6+)*

218 This action resets the processor.

Action URI: {Base URI of target resource}/Actions/Processor.Reset

219 Perform the action using a POST to the specific Action URI for this resource. Parameters for the action are passed in a JSON body and are defined as follows:

{			
ResetType }	string (enum)	optional	The type of reset. *For the possible property values, see ResetType in Property details.*

220 Property details

221 BaseSpeedPriorityState:

222 The state of the base frequency settings of the operation configuration applied to this processor.

string	Description
Disabled	Base speed priority is disabled.
Enabled	Base speed priority is enabled.

223 FpgaType:

224 The FPGA type.

string	Description
Discrete	The discrete FPGA device.
Integrated	The FPGA device integrated with other processor in the single chip.

225 InstructionSet:

226 The instruction set of the processor.

string	Description
ARM-A32	ARM 32-bit.
ARM-A64	ARM 64-bit.
IA-64	Intel IA-64.
MIPS32	MIPS 32-bit.
MIPS64	MIPS 64-bit.
OEM	OEM-defined.
PowerISA *(v1.4+)*	PowerISA-64 or PowerISA-32.
x86	x86 32-bit.
x86-64	x86 64-bit.

227 InterfaceType:

228 The interface type.

string	Description
AMBA *(v1.8+)*	The Arm Advanced Microcontroller Bus Architecture interface.
CCIX *(v1.8+)*	The Cache Coherent Interconnect for Accelerators interface.

string	Description
CXL *(v1.8+)*	The Compute Express Link interface.
Ethernet	An Ethernet interface.
OEM	An OEM-defined interface.
PCIe	A PCI Express interface.
QPI	The Intel QuickPath Interconnect.
UPI	The Intel UltraPath Interconnect.

229 ## MemoryType:

230 The type of memory used by this processor.

string	Description
DDR	Double data rate synchronous dynamic random-access memory.
DDR2	Double data rate type two synchronous dynamic random-access memory.
DDR3	Double data rate type three synchronous dynamic random-access memory.
DDR4	Double data rate type four synchronous dynamic random-access memory.
DDR5	Double data rate type five synchronous dynamic random-access memory.
Flash	Flash memory.
GDDR	Synchronous graphics random-access memory.
GDDR2	Double data rate type two synchronous graphics random-access memory.
GDDR3	Double data rate type three synchronous graphics random-access memory.
GDDR4	Double data rate type four synchronous graphics random-access memory.
GDDR5	Double data rate type five synchronous graphics random-access memory.
GDDR5X	Double data rate type five synchronous graphics random-access memory.
GDDR6	Double data rate type five synchronous graphics random-access memory.
HBM1	High Bandwidth Memory.
HBM2	The second generation of High Bandwidth Memory.

string	Description
HBM3	The third generation of High Bandwidth Memory.
L1Cache	L1 cache.
L2Cache	L2 cache.
L3Cache	L3 cache.
L4Cache	L4 cache.
L5Cache	L5 cache.
L6Cache	L6 cache.
L7Cache	L7 cache.
OEM	OEM-defined.
SDRAM	Synchronous dynamic random-access memory.
SGRAM	Synchronous graphics RAM.
SRAM	Static random-access memory.

231 ## OperatingMode:

232 The operating mode of this control.

string	Description
Automatic	The control will automatically make adjustments to match the current value of the control to the set point.
Disabled	The control is disabled.
Manual	The control will make adjustments to the current value when the set point is changed.
Physical	A physical control that can only be monitored through this interface.

233 ## ProcessorArchitecture:

234 The architecture of the processor.

string	Description
ARM	ARM.
IA-64	Intel Itanium.
MIPS	MIPS.
OEM	OEM-defined.
Power *(v1.4+)*	Power.

string	Description
x86	x86 or x86-64.

ProcessorType:

The type of processor.

string	Description
Accelerator	An accelerator.
Core *(v1.3+)*	A core in a processor.
CPU	A CPU.
DSP	A DSP.
FPGA	An FPGA.
GPU	A GPU.
OEM	An OEM-defined processing unit.
Thread *(v1.3+)*	A thread in a processor.

ResetType:

The type of reset.

string	Description
ForceOff	Turn off the unit immediately (non-graceful shutdown).
ForceOn	Turn on the unit immediately.
ForceRestart	Shut down immediately and non-gracefully and restart the system.
GracefulRestart	Shut down gracefully and restart the system.
GracefulShutdown	Shut down gracefully and power off.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system.
On	Turn on the unit.
PowerCycle	Power cycle the unit. Behaves like a full power removal, followed by a power restore to the resource.
PushPowerButton	Simulate the pressing of the physical power button on this unit.

TurboState:

The state of the turbo for this processor.

string	Description
Disabled	Turbo is disabled.
Enabled	Turbo is enabled.

241 ## Example response


```
{
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/1",
    "@odata.type": "#Processor.v1_11_0.Processor",
    "Name": "Processor",
    "Id": "1",
    "Socket": "CPU 1",
    "ProcessorType": "CPU",
    "ProcessorArchitecture": "x86",
    "InstructionSet": "x86-64",
    "Manufacturer": "Intel(R) Corporation",
    "Model": "Multi-Core Intel(R) Xeon(R) processor 7xxx Series",
    "ProcessorId": {
        "VendorId": "GenuineIntel",
        "IdentificationRegisters": "0x34AC34DC8901274A",
        "EffectiveFamily": "0x42",
        "EffectiveModel": "0x61",
        "Step": "0x1",
        "MicrocodeInfo": "0x429943"
    },
    "PowerLimitControlWatts": {
        "OperatingMode": "Automatic",
        "SetPoint": 90,
        "Reading": 95
    },
    "MaxSpeedMHz": 3700,
    "TotalCores": 8,
    "TotalThreads": 16,
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Location": {
        "PartLocation": {
            "ServiceLabel": "Processor 1",
            "LocationType": "Socket",
            "LocationOrdinalValue": 0
        }
    },
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```

ProcessorMetrics 1.2.0

v1.2	*v1.1*	*v1.0*
TBD	2020.1	2018.3

The ProcessorMetrics schema contains usage and health statistics for a processor.

URIs:

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/ProcessorMetrics

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/ProcessorMetrics

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics

/redfish/v1/CompositionService/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/ProcessorSummary/ProcessorMetrics

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/ProcessorMetrics

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/ProcessorMetrics

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics

/redfish/v1/ResourceBlocks/*{ResourceBlockId}*/Systems/*{ComputerSystemId}*/ProcessorSummary/ProcessorMetrics

/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/ProcessorMetrics

/redfish/v1/Systems/*{ComputerSystemId}*/Processors/*{ProcessorId}*/SubProcessors/*{ProcessorId2}*/ProcessorMetrics

/redfish/v1/Systems/*{ComputerSystemId}*/ProcessorSummary/ProcessorMetrics

AverageFrequencyMHz *(deprecated v1.1)*	number (MHz)	read-only (null)	The average frequency of the processor. *Deprecated in v1.1 and later. This property has been deprecated in favor of OperatingSpeedMHz property.*
BandwidthPercent	number (%)	read-only (null)	The CPU bandwidth as a percentage.
Cache [{	array		The processor cache metrics.
CacheMiss	number	read-only (null)	The number of cache line misses in millions.
CacheMissesPerInstruction	number	read-only (null)	The number of cache misses per instruction.

HitRatio	number	read-only (null)	The cache line hit ratio.
Level	string	read-only (null)	The cache level.
OccupancyBytes	integer (bytes)	read-only (null)	The total cache level occupancy in bytes.
OccupancyPercent }]	number (%)	read-only (null)	The total cache occupancy percentage.
ConsumedPowerWatt *(deprecated v1.2)*	number (Watts)	read-only (null)	The power, in watts, that the processor has consumed. *Deprecated in v1.2 and later. This property has been deprecated in favor of the Sensor properties in EnvironmentMetrics.*
CoreMetrics [{	array		The processor core metrics.
CoreCache [{	array		The cache metrics of this core in the processor.
CacheMiss	number	read-only (null)	The number of cache line misses in millions.
CacheMissesPerInstruction	number	read-only (null)	The number of cache misses per instruction.
HitRatio	number	read-only (null)	The cache line hit ratio.
Level	string	read-only (null)	The cache level.
OccupancyBytes	integer (bytes)	read-only (null)	The total cache level occupancy in bytes.
OccupancyPercent }]	number (%)	read-only (null)	The total cache occupancy percentage.
CoreId	string	read-only (null)	The processor core identifier.
CStateResidency [{	array		The C-state residency of this core in the processor.
Level	string	read-only (null)	The C-state level, such as C0, C1, or C2.
ResidencyPercent }]	number (%)	read-only (null)	The percentage of time that the processor or core has spent in this particular level of C-state.
InstructionsPerCycle	number	read-only	The number of

		(null)	instructions per clock cycle of this core.
IOStallCount	number	read-only (null)	The number of stalled cycles due to I/O operations.
MemoryStallCount	number	read-only (null)	The number of stalled cycles due to memory operations.
UnhaltedCycles }]	number	read-only (null)	The unhalted cycles count of this core.
FrequencyRatio	number	read-only (null)	The frequency relative to the nominal processor frequency ratio.
KernelPercent	number (%)	read-only (null)	The percentage of time spent in kernel mode.
LocalMemoryBandwidthBytes	integer (bytes)	read-only (null)	The local memory bandwidth usage in bytes.
OperatingSpeedMHz *(v1.1+)*	integer (MHz)	read-only (null)	Operating speed of the processor in MHz.
RemoteMemoryBandwidthBytes	integer (bytes)	read-only (null)	The remote memory bandwidth usage in bytes.
TemperatureCelsius *(deprecated v1.2)*	number (Celsius)	read-only (null)	The temperature of the processor. *Deprecated in v1.2 and later. This property has been deprecated in favor of the Sensor properties in EnvironmentMetrics.*
ThrottlingCelsius	number (Celsius)	read-only (null)	The CPU margin to throttle (temperature offset in degree Celsius).
UserPercent	number (%)	read-only (null)	The percentage of time spent in user mode.

Example response

```
{
    "@odata.type": "#ProcessorMetrics.v1_0_2.ProcessorMetrics",
    "Id": "Metrics",
    "Name": "Processor Metrics",
    "BandwidthPercent": 62,
    "AverageFrequencyMHz": 2400,
    "ThrottlingCelsius": 65,
    "TemperatureCelsius": 41,
```

```
"ConsumedPowerWatt": 82,
"FrequencyRatio": 0.00432,
"Cache": [
    {
        "Level": "3",
        "CacheMiss": 0.12,
        "HitRatio": 0.719,
        "CacheMissesPerInstruction": 0.00088,
        "OccupancyBytes": 3030144,
        "OccupancyPercent": 90.1
    }
],
"LocalMemoryBandwidthBytes": 18253611008,
"RemoteMemoryBandwidthBytes": 81788928,
"KernelPercent": 2.3,
"UserPercent": 34.7,
"CoreMetrics": [
    {
        "CoreId": "core0",
        "InstructionsPerCycle": 1.16,
        "UnhaltedCycles": 6254383746,
        "MemoryStallCount": 58372,
        "IOStallCount": 2634872,
        "CoreCache": [
            {
                "Level": "2",
                "CacheMiss": 0.472,
                "HitRatio": 0.57,
                "CacheMissesPerInstruction": 0.00346,
                "OccupancyBytes": 198231,
                "OccupancyPercent": 77.4
            }
        ],
        "CStateResidency": [
            {
                "Level": "C0",
                "Residency": 1.13
            },
            {
                "Level": "C1",
                "Residency": 26
            },
            {
                "Level": "C3",
                "Residency": 0.00878
            },
            {
                "Level": "C6",
                "Residency": 0.361
            },
```

```
                {
                    "Level": "C7",
                    "Residency": 72.5
                }
            ]
        }
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/Processors/FPGA1/ProcessorMetrics"
}
```

246 # Sensor 1.2.0

v1.2	*v1.1*	*v1.0*
TBD	2019.4	2018.3

247 The Sensor schema describes a sensor and its properties.

248 ## URIs:

/redfish/v1/Chassis/*{ChassisId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Sensors/*{SensorId}*

Accuracy	number (%)	read-only (null)	The estimated percent error of measured versus actual values.
AdjustedMaxAllowableOperatingValue	number	read-only (null)	The adjusted maximum allowable operating value for this equipment based on the environmental conditions.
AdjustedMinAllowableOperatingValue	number	read-only (null)	The adjusted minimum allowable operating value for this equipment based on the environmental conditions.
ApparentVA	number (V.A)	read-only (null)	The product of voltage and current for an AC circuit, in Volt-Ampere units.
CrestFactor *(v1.1+)*	number	read-only (null)	The crest factor for this sensor.
ElectricalContext	string (enum)	read-only (null)	The combination of current-carrying conductors.

			For the possible property values, see ElectricalContext in Property details.
Implementation *(v1.1+)*	string (enum)	read-only (null)	The implementation of the sensor. *For the possible property values, see Implementation in Property details.*
LifetimeReading *(v1.1+)*	number	read-only (null)	The total accumulation value for this sensor.
LoadPercent *(deprecated v1.1)*	number (%)	read-only (null)	The power load utilization for this sensor. *Deprecated in v1.1 and later. This property has been deprecated in favor of using a sensor instance with a ReadingType of `Percent` to show utilization values when needed.*
Location { }	object		The location information for this sensor. *See the Resource schema for details on this property.*
MaxAllowableOperatingValue	number	read-only (null)	The maximum allowable operating value for this equipment.
MinAllowableOperatingValue	number	read-only (null)	The minimum allowable operating value for this equipment.
PeakReading	number	read-only (null)	The peak sensor value.
PeakReadingTime	string (date-time)	read-only (null)	The time when the peak sensor value occurred.
PhysicalContext	string (enum)	read-only (null)	The area or device to which this sensor measurement applies. *For the possible property values, see PhysicalContext in Property details.*
PhysicalSubContext	string (enum)	read-only (null)	The usage or location within a device to which this sensor measurement applies. *For the possible property values, see PhysicalSubContext in Property details.*

PowerFactor	number	read-only (null)	The power factor for this sensor.
Precision	number	read-only (null)	The number of significant digits in the reading.
ReactiveVAR	number (V.A)	read-only (null)	The square root of the difference term of squared ApparentVA and squared Power (Reading) for a circuit, in var units.
Reading	number	read-only (null)	The sensor value.
ReadingRangeMax	number	read-only (null)	The maximum possible value for this sensor.
ReadingRangeMin	number	read-only (null)	The minimum possible value for this sensor.
ReadingTime *(v1.1+)*	string (date-time)	read-only (null)	The date and time that the reading was acquired from the sensor.
ReadingType	string (enum)	read-only (null)	The type of sensor. *For the possible property values, see ReadingType in Property details.*
ReadingUnits	string	read-only (null)	The units of the reading and thresholds.
RelatedItem *(v1.2+)* [{	array		An array of links to resources or objects that this sensor services.
@odata.id }]	string (URI)	read-only	The unique identifier for a resource.
SensingFrequency *(deprecated v1.1)*	number	read-only (null)	The time interval between readings of the physical sensor. *Deprecated in v1.1 and later. This property has been deprecated in favor of the SensingInterval property, which uses the duration time format for interoperability.*
SensingInterval *(v1.1+)*	string	read-only (null)	The time interval between readings of the sensor.
SensorResetTime	string (date-time)	read-only (null)	The date and time when the time-based properties were last reset.
SpeedRPM *(v1.2+)*	number (RPM)	read-only (null)	The rotational speed.

Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*
THDPercent *(v1.1+)*	number	read-only (null)	The total harmonic distortion (THD).
Thresholds {	object		The set of thresholds defined for this sensor.
LowerCaution {	object		The value at which the reading is below normal range.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
LowerCautionUser *(v1.2+)* {	object		The value at which the reading is below normal range.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the

			threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
LowerCritical {	object		The value at which the reading is below normal range but not yet fatal.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
LowerCriticalUser *(v1.2+)* {	object		The value at which the reading is below normal

			range but not yet fatal.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
LowerFatal {	object		The value at which the reading is below normal range and fatal.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write	The MessageId used when

		(null)	generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
UpperCaution {	object		The value at which the reading is above normal range.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
UpperCautionUser *(v1.2+)* {	object		The value at which the reading is above normal range.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.

Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
UpperCritical {	object		The value at which the reading is above normal range but not yet fatal.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
UpperCriticalUser *(v1.2+)* {	object		The value at which the reading is above normal range but not yet fatal.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in*

			Property details.
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading }	number	read-write (null)	The threshold value.
UpperFatal {	object		The value at which the reading is above normal range and fatal.
Activation	string (enum)	read-write (null)	The direction of crossing that activates this threshold. *For the possible property values, see Activation in Property details.*
DwellTime	string	read-write (null)	The duration the sensor value must violate the threshold before the threshold is activated.
Reaction *(v1.2+)* {	object		The reactions taken when this threshold is violated.
Description *(v1.2+)*	string	read-write	The description of this resource. Used for commonality in the schema definitions.
ExecuteJob *(v1.2+)*	string	read-write (null)	The JobId used to execute a Job.
GenerateEvent *(v1.2+)*	string	read-write (null)	The MessageId used when generating an event.
TriggerMetricReport *(v1.2+)* }	boolean	read-write	Generate a metric report.
Reading	number	read-write	The threshold value.

} }		(null)	
VoltageType	string (enum)	read-only (null)	The voltage type for this sensor. *For the possible property values, see VoltageType in Property details.*

Actions

ResetMetrics

Resets metrics related to this sensor.

Action URI: {Base URI of target resource}/Actions/Sensor.ResetMetrics

Perform the action using a POST to the specific Action URI for this resource. This action takes no parameters.

Property details

Activation:

The direction of crossing that activates this threshold.

string	Description
Decreasing	Value decreases below the threshold.
Either	Value crosses the threshold in either direction.
Increasing	Value increases above the threshold.

ElectricalContext:

The combination of current-carrying conductors.

string	Description
Line1	The circuits that share the L1 current-carrying conductor.
Line1ToLine2	The circuit formed by L1 and L2 current-carrying conductors.
Line1ToNeutral	The circuit formed by L1 and neutral current-carrying conductors.
Line1ToNeutralAndL1L2	The circuit formed by L1, L2, and neutral current-carrying conductors.
Line2	The circuits that share the L2 current-carrying conductor.
Line2ToLine3	The circuit formed by L2 and L3 current-carrying conductors.
Line2ToNeutral	The circuit formed by L2 and neutral current-carrying

string	Description
	conductors.
Line2ToNeutralAndL1L2	The circuit formed by L1, L2, and Neutral current-carrying conductors.
Line2ToNeutralAndL2L3	The circuits formed by L2, L3, and neutral current-carrying conductors.
Line3	The circuits that share the L3 current-carrying conductor.
Line3ToLine1	The circuit formed by L3 and L1 current-carrying conductors.
Line3ToNeutral	The circuit formed by L3 and neutral current-carrying conductors.
Line3ToNeutralAndL3L1	The circuit formed by L3, L1, and neutral current-carrying conductors.
LineToLine	The circuit formed by two current-carrying conductors.
LineToNeutral	The circuit formed by a line and neutral current-carrying conductor.
Neutral	The grounded current-carrying return circuit of current-carrying conductors.
Total	The circuit formed by all current-carrying conductors.

258 ## Implementation:

259 The implementation of the sensor.

string	Description
PhysicalSensor	The reading is acquired from a physical sensor.
Reported	The reading is obtained from software or a device.
Synthesized	The reading is obtained by applying a calculation on one or more properties. The calculation is not provided.

260 ## PhysicalContext:

261 The area or device to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.

string	Description
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.

string	Description
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Rectifier	A rectifier device.
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

262 ## PhysicalSubContext:

263 The usage or location within a device to which this sensor measurement applies.

string	Description
Input	The input.
Output	The output.

264 ## ReadingType:

265 The type of sensor.

string	Description
AirFlow	Airflow.
Altitude	Altitude.
Barometric	Barometric pressure.
Current	Current.
EnergyJoules	Energy (Joules).
EnergykWh	Energy (kWh).
Frequency	Frequency.
Humidity	Relative Humidity.

string	Description
LiquidFlow	Liquid flow.
LiquidLevel	Liquid level.
Percent *(v1.1+)*	Percent.
Power	Power.
Pressure	Pressure.
Rotational	Rotational.
Temperature	Temperature.
Voltage	Voltage (AC or DC).

VoltageType:

The voltage type for this sensor.

string	Description
AC	Alternating current.
DC	Direct current.

Example response

```
{
    "@odata.type": "#Sensor.v1_1_0.Sensor",
    "Id": "CabinetTemp",
    "Name": "Rack Temperature",
    "ReadingType": "Temperature",
    "ReadingTime": "2019-12-25T04:14:33+06:00",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Reading": 31.6,
    "ReadingUnits": "C",
    "ReadingRangeMin": 0,
    "ReadingRangeMax": 70,
    "Accuracy": 0.25,
    "Precision": 1,
    "SensingInterval": "PT3S",
    "PhysicalContext": "Chassis",
    "Thresholds": {
        "UpperCritical": {
            "Reading": 40,
            "Activation": "Increasing"
        },
```

```
        "UpperCaution": {
            "Reading": 35,
            "Activation": "Increasing"
        },
        "LowerCaution": {
            "Reading": 10,
            "Activation": "Increasing"
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1/Sensors/CabinetTemp"
}
```

ThermalMetrics 1.0.0

v1.0
TBD

The ThermalMetrics schema represents the thermal metrics of a chassis.

URIs:

/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem/ThermalMetrics

TemperatureCelsius {	object	(null)	The summary and subsystem temperatures readings for this device. PROPOSAL: A set of possible sensor readings provided for a device. This proposal covers more cases than a single sensor, while attempting to maintain easy access to the reading(s) for client software. The `Internal` (or similar name) sensor would be populated first to ensure an interoperable sensor is always available. Additional sensors are populated using common use cases (as referenced by ASHRAE and others). Sensor readings not covered by this proposal would still be available in the Sensor collection, and could be surfaced in this resource using OEM extensions if necessary.
Ambient {	object (excerpt)		The ambient temperature of this subsystem. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*

DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading }	number	read-only (null)	The sensor value.
Exhaust {	object (excerpt)		The exhaust temperature of this subsystem. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading }	number	read-only (null)	The sensor value.
Intake {	object (excerpt)		The intake temperature of this subsystem. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading }	number	read-only (null)	The sensor value.
Internal {	object (excerpt)		The internal temperature of this subsystem. *This object is an excerpt of the Sensor resource located at the URI shown in DataSourceUri.*
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
Reading } }	number	read-only (null)	The sensor value.
TemperatureSummaryCelsius [{	array (excerpt)		The temperatures readings for this device. PROPOSAL: All temperature sensor readings provided for a device. This property would be provided in addition to the TemperatureCelsius property (which provides simpler access to known/interoperable use cases). This array covers all temperature sensors in an implementation. A client attempting to obtain a specific sensor must iterate through the array to examine the DeviceName to match or values to other devices or instances. *This object is an excerpt of the*

			Sensor resource located at the URI shown in DataSourceUri.
DataSourceUri	string (URI)	read-only (null)	The link to the resource that provides the data for this sensor.
DeviceName *(v1.2+)*	string	read-only (null)	The name of the device.
PhysicalContext	string (enum)	read-only (null)	The area or device to which this sensor measurement applies. *For the possible property values, see PhysicalContext in Property details.*
PhysicalSubContext	string (enum)	read-only (null)	The usage or location within a device to which this sensor measurement applies. *For the possible property values, see PhysicalSubContext in Property details.*
Reading }]	number	read-only (null)	The sensor value.

272 # Actions

273 ## ResetMetrics

274 This action resets the summary metrics related to this equipment.

Action URI: {Base URI of target resource}/Actions/ThermalMetrics.ResetMetrics

275 Perform the action using a POST to the specific Action URI for this resource. This action takes no parameters.

276 # Property details

277 ## PhysicalContext:

278 The area or device to which this sensor measurement applies.

string	Description
Accelerator	An accelerator.
ACInput	An AC input.
ACMaintenanceBypassInput	An AC maintenance bypass input.
ACOutput	An AC output.
ACStaticBypassInput	An AC static bypass input.
ACUtilityInput	An AC utility input.
ASIC	An ASIC device, such as a networking chip or chipset component.

string	Description
Back	The back of the chassis.
Backplane	A backplane within the chassis.
Chassis	The entire chassis.
ComputeBay	Within a compute bay.
CoolingSubsystem	The entire cooling, or air and liquid, subsystem.
CPU	A processor (CPU).
CPUSubsystem	The entire processor (CPU) subsystem.
DCBus	A DC bus.
Exhaust	The air exhaust point or points or region of the chassis.
ExpansionBay	Within an expansion bay.
Fan	A fan.
FPGA	An FPGA.
Front	The front of the chassis.
GPU	A graphics processor (GPU).
GPUSubsystem	The entire graphics processor (GPU) subsystem.
Intake	The air intake point or points or region of the chassis.
LiquidInlet	The liquid inlet point of the chassis.
LiquidOutlet	The liquid outlet point of the chassis.
Lower	The lower portion of the chassis.
Memory	A memory device.
MemorySubsystem	The entire memory subsystem.
Motor	A motor.
NetworkBay	Within a networking bay.
NetworkingDevice	A networking device.
PowerSubsystem	The entire power subsystem.
PowerSupply	A power supply.
PowerSupplyBay	Within a power supply bay.
Rectifier	A rectifier device.

string	Description
Room	The room.
StorageBay	Within a storage bay.
StorageDevice	A storage device.
SystemBoard	The system board (PCB).
Transformer	A transformer.
TrustedModule	A trusted module.
Upper	The upper portion of the chassis.
VoltageRegulator	A voltage regulator device.

PhysicalSubContext:

The usage or location within a device to which this sensor measurement applies.

string	Description
Input	The input.
Output	The output.

Example response


```
{
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/ThermalMetrics",
    "@odata.type": "#ThermalMetrics.v1_0_0.ThermalMetrics",
    "Id": "ThermalMetrics",
    "Name": "Chassis Thermal Metrics",
    "TemperatureCelsius": {
        "Internal": {
            "Reading": 39,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPU1Temp"
        },
        "Intake": {
            "Reading": 24.8,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/IntakeTemp"
        },
        "Ambient": {
            "Reading": 22.5,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/AmbientTemp"
        },
        "Exhaust": {
            "Reading": 40.5,
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/ExhaustTemp"
        }
    },
```

```
    "TemperatureSummaryCelsius": [
        {
            "Reading": 40,
            "DeviceName": "SystemBoard",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/SysBrdTemp"
        },
        {
            "Reading": 24.8,
            "DeviceName": "Intake",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/IntakeTemp"
        },
        {
            "Reading": 39,
            "DeviceName": "CPUSubsystem",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/CPUTemps"
        },
        {
            "Reading": 42,
            "DeviceName": "MemorySubsystem",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/MemoryTemp"
        },
        {
            "Reading": 33,
            "DeviceName": "PowerSupply",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/PSTemp"
        },
        {
            "Reading": 40.5,
            "DeviceName": "Exhaust",
            "DataSourceUri": "/redfish/v1/Chassis/1U/Sensors/ExhaustTemp"
        }
    ],
    "Oem": {},
    "@Redfish.Copyright": "Copyright 2014-2020 DMTF. For the full DMTF copyright
policy, see http://www.dmtf.org/about/policies/copyright."
}
```


282 # ThermalSubsystem 1.0.0

v1.0
TBD

283 This ThermalSubsystem schema contains the definition for the thermal subsystem of a chassis.

284 ## URIs:

/redfish/v1/Chassis/*{ChassisId}*/ThermalSubsystem

CoolingMetrics {	object		The link to the summary of cooling metrics for this subsystem. *See the CoolingMetrics schema for details on this property.*
@odata.id }	string	read-only	*Link to a CoolingMetrics resource. See the Links section and the CoolingMetrics schema for details.*
FanRedundancy [{	array		The redundancy information for the groups of fans in this subsystem.
MaxFansSupported	integer	read-only (null)	The maximum number of fans supported for this redundancy group.
MinFansNeeded	integer	read-only required (null)	The minimum number of fans needed for this group to be redundant.
RedundancySet [{	array	required	The links to the fans included in this redundancy set.
@odata.id }]	string	read-only	*Link to a Fan resource. See the Links section and the Fan schema for details.*
RedundancySet@odata.count	integer	read-only	The number of items in a collection.
RedundancyType	string (enum)	read-only required (null)	The redundancy mode of the group. *For the possible property values, see RedundancyType in Property details.*
Status { } }]	object	required	The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*
Fans {	object		The link to the collection of fans within this subsystem.
@odata.id }	string (URI)	read-only	The unique identifier for a resource.
Status { }	object		The status and health of the resource and its subordinate or dependent resources. *See the Resource schema for details on this property.*
ThermalMetrics {	object		The link to the summary of thermal metrics for this subsystem. *See the ThermalMetrics schema for details on this property.*
@odata.id	string	read-only	*Link to a ThermalMetrics resource.*

}			*See the Links section and the ThermalMetrics schema for details.*

Property details

RedundancyType:

The redundancy mode of the group.

string	Description
Failover	Failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions.
NotRedundant	The subsystem is not configured in a redundancy mode, either due to configuration or the functionality has been disabled by the user.
NPlusM	Multiple units are available and active such that normal operation will continue if one or more units fail.
Sharing	Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail.
Sparing	One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.

Example response


```
{
    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem",
    "@odata.type": "#ThermalSubsystem.v1_0_0.ThermalSubsystem",
    "Name": "Thermal Subsystem for Chassis",
    "FanRedundancy": [
        {
            "RedundancyType": "NPlusM",
            "MaxFansSupported": 2,
            "MinFansNeeded": 1,
            "RedundancySet": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/Bay2"
                }
            ],
            "Status": {
                "State": "Enabled",
                "Health": "OK"
            }
        },
        {
```

```
            "RedundancyType": "NPlusM",
            "MaxFansSupported": 2,
            "MinFansNeeded": 1,
            "RedundancySet": [
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/CPU1"
                },
                {
                    "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans/CPU2"
                }
            ],
            "Status": {
                "State": "Disabled"
            }
        }
    ],
    "Fans": {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/Fans"
    },
    "ThermalMetrics": {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/ThermalMetrics"
    },
    "CoolingMetrics": {
        "@odata.id": "/redfish/v1/Chassis/1U/ThermalSubsystem/CoolingMetrics"
    },
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Oem": {}
}
```

Redfish documentation generator

This document was created using the Redfish Documentation Generator utility, which uses the contents of the Redfish schema files (in JSON schema format) to automatically generate the bulk of the text. The source code for the utility is available for download at the DMTF's Github repository located at http://www.github.com/DMTF/Redfish-Tools.