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# Redfish for Power Distribution Equipment

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CONTENTS

# 1 Foreword

This white paper covers Redfish schema support for managing power distribution equipment and infrastructure. This includes power distribution units, power shelves, transfer switches, electrical buses or busways, and facility location information.

The Redfish standard has expanded its coverage of data center components, having started with server management and added storage systems, networking and fabric support. As this provides a consistent protocol and data model for managing the bulk of the IT equipment in a data center, it was natural to further extend the data model to include power distribution and other facility services. This allows the utilization of a common set of tools to manage the entire infrastructure, and enable development of tools that can integrate data across the various subsystems to optimize resource utilization.

## 1.1 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 applications using Redfish. Contains an interactive schema explorer, hosted schema and other links.
- **Redfish User Forum:** https://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 for working with the Redfish API.
- **Redfish Standards:** https://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.dmtf.org/standards/spmf - Companies involved, upcoming schedules and future work, charter, and information about joining.

# 2 Redfish service implementations

This white paper focuses on the Redfish resources defined specifically to model the subsystems and components involved with power distribution equipment. A Redfish service implementation will also include a number of resources and functions common to any network-enabled management controller. For brevity, these functions and their implementation are not discussed in this white paper.

The following is a list of common functions typically included in a Redfish service implementation, and the standard schema definitions that define those resources. Details on those resource definitions can be found in DSP2046.

| Function | Relevant Redfish schemas |
|---|---|
| User access | AccountService, ManagerAccount, Role, Session, SessionService |
| Event notification | EventService, EventDestination |
| Logging | LogService, LogEntry |
| Firmware update | SoftwareInventory, UpdateService |
| Certificates | Certificate, CertificateService |
| Management controller | Manager, RegisteredClient |
| Network configuration | EthernetInterface, ManagerNetworkProtocol, OutboundConnection |
| Licensing | License, LicenseService |

# 3 Power distribution equipment data model concepts

Modeling power distribution equipment required the addition of several new concepts to the Redfish data model. It is expected that these concepts will also be leveraged to model additional facility systems and monitoring equipment.

## 3.1 Sensor model and excerpts

Redfish models a device that provides a single data value or "reading" as a Sensor. Associated with that reading is a wealth of metadata (data about the reading), which may be used by software or administrators to better understand the reading or make decisions based on its value.

A simple example is a thermometer. It provides a single reading of temperature. But associated with that reading are a number of properties that describe that reading, such as the thermometer's accuracy, range of possible values, and whether it can read in whole degrees or tenths of a degree. In addition, there are thresholds associated with the thermometer that will depend on its usage, which may be set by the product design, or may be set by the end user.

Some sensors have additional readings that are related to the primary reading and must be acquired and reported at the same time to be useful. In these cases, a Sensor may have additional properties to return those values, with the most frequently used data assigned as `Reading`. For example, a Power sensor will return "Real Power" in the `Reading`, and will also include properties for `ReactiveVAR`, `PowerFactor`, and `ApparentVA` values.

All of this information is made available in the resource for a Sensor in the Redfish model. Every Sensor gets its own individual resource, and the properties are consistent across all types of readings. A property called `ReadingType` allows the user to determine what kind of sensor and reading each Sensor resource represents. The `ReadingType` also mandates the units of measure assigned for each type of reading. This requirement ensures interoperability among Sensor implementations and prevents software errors that occur when different units are used but not recognized (e.g., Celsius vs. Fahrenheit temperatures).

Since the most frequently used property of a sensor is its reading (value), Redfish added the ability to incorporate just a portion of the Sensor resource when appropriate elsewhere in the data model. This is called a "Schema Excerpt" and is defined in the schema for a Redfish resource. For a Sensor, the primary excerpt includes just the `Reading`, as the remaining Sensor properties are generally static data and therefore do not need to be retrieved frequently.

## 3.2 Chassis and Facility

One of the basic model constructs for Redfish is the presentation of both a "Functional" and a "Physical" view of the managed systems or devices. For Computer Systems (servers) this results in resources for both a `ComputerSystem` (functional view) and a `Chassis` (physical view). The chassis model works well for equipment that is "contained

within a sheet metal box", but the terminology and concept becomes confusing when describing equipment placed in a room.

This was addressed by the addition of the `Facility` schema to describe a room or other physical location that can contain equipment and likely has relationships to other facilities. Many of the concepts from the `Chassis` schema were applied to `Facility`, including the ability to nest facilities (e.g., a Room is contained by a Floor or Building).

To enable a number of typical software use cases, Redfish implementations for power equipment must include at least one `Chassis` instance, to provide the physical view of the data model. The `Chassis` can then be linked to the `Facility` instance where the equipemnt is installed, bridging the two physical models to show physical location.

### 3.2.1 Power Domain

One of the primary associations within a facility is the physical relationship of power equipment to describe the equipment affected by a power system or to report the responsible organization (humans or software) of a set of equipment.

# 4 Power Distribution resource tree

Below is a diagram of the resource tree, starting at the Redfish Service Root, containing all resources used to model a rack-based Power Distribution Unit (PDU). The individual resources are detailed in the following sections.

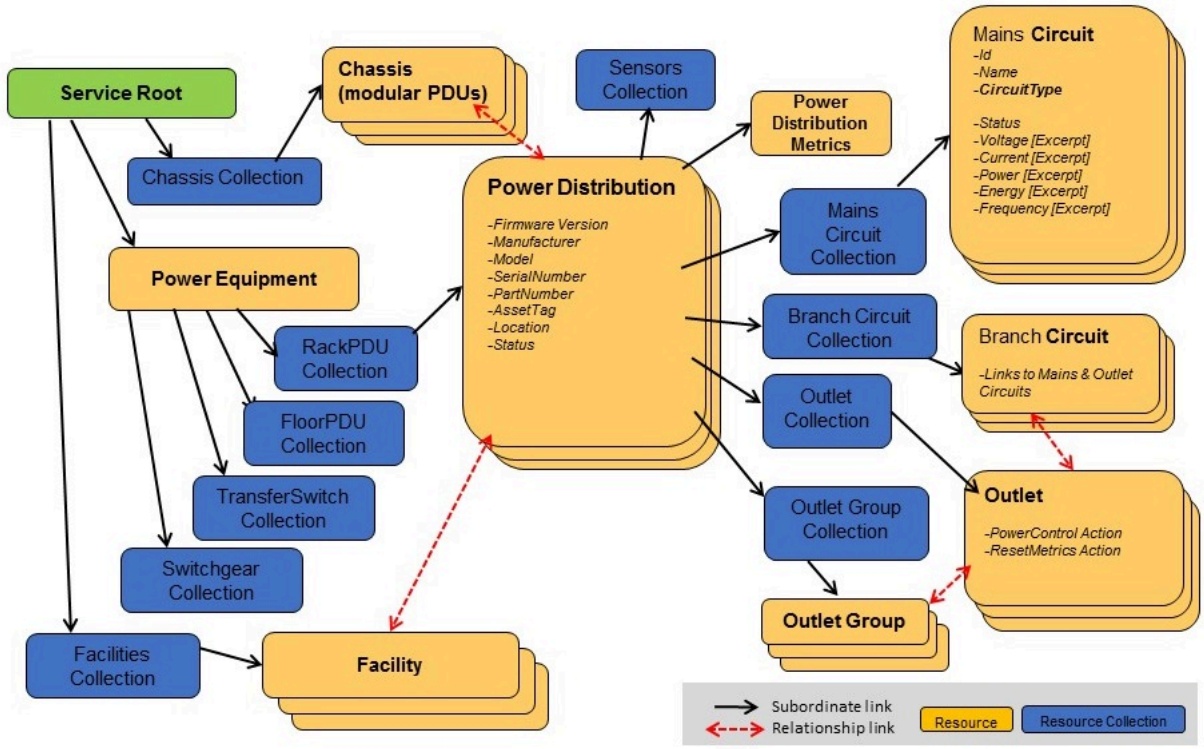


*Figure 1: Resource Tree for a Power Distribution Unit*

## 4.1 Power Equipment

A new resource, linked from the Service Root, was added to contain all links to Power Distribution equipment and any future properties that may relate to power equipment in general. The `PowerEquipment` resource can be used to quickly determine the types of power equipment supported by the Service. It also allows for future additions to the schema without requiring changes to the `ServiceRoot` schema.

## 4.2 Power Distribution

The main resource for describing a power distribution component is the `PowerDistribution` schema and resource.

As various types of power distribution equipment contain similar or common functions (power inputs, power outputs, electrical measurements, and general product identification), these are all modeled using the same schema. This schema is then used to populate a number of Resource Collections, grouped by the type of equipment, but all sharing the same definition.

In the current release of the schema, there are separate Resource Collections for rack-mounted Power Distribution Units (PDUs), Floor-level PDUs, Power Shelf units, Buses or Busways, Transfer Switches (Manual or Automatic), and various Switchgear. It is expected that the schema will be expanded over time to include un-interruptible Power Systems (UPSs) and additional types of equipment.

### 4.2.1 Power Distribution Metrics

To provide efficient access to the electrical measurements of an entire power distribution unit, a separate metrics resource is available, which reports total power and energy consumption. The `PowerDistributionMetrics` schema expands on the definition of the `EnvironmentMetrics` schema, and can safely be considered a superset, such that any property defined in both schemas will share a common definition.

### 4.2.2 Support for modular or large-scale units

For larger or more complex power distribution units, some additional modeling may be necessary to fully explain relationships and capabilities. This typically includes "modular" power systems whose configuration will vary depending on customer needs. For these units, the `PowerDistibution` schema contains links to show multiple, perhaps nested, `Chassis` resources that can be used to model those modules and their relationships.

## 4.3 Circuits

A key component of any power distribution unit is the electrical `Circuit`, which can describe either an input to the unit, or an output. The various types of circuits are once again described using a single `Circuit` schema, with a `CircuitType` property used to specify a particular usage. As with the PDUs, circuits are separated by type, and populate separate Resource Collections so that "input" vs. "output" circuits can be easily located.

Each circuit resource contains properties to describe the configuration and capabilities of a particular circuit, as well as measurements of the electrical characteristics of the circuit. The supported measurements include voltage, current, frequency, power (real power, reactive power, and power factor), and energy consumed (kWh).

## 4.4 Outlets

Individual electrical outlets are described by the `Outlet` schema and Resource Collection. This schema shares the majority of its property definitions with `Circuit`, with some additions to describe the plug types and relationship to its circuit.

There is a single `Outlet` Resource Collection that contains all outlets from all output circuits of a PDU. This removes the need to know the circuit associations prior to locate a particular outlet.

## 4.5 Outlet Groups

Outlets may be contained in a group, either dictated by electrical functionality (e.g., a Battery-backed outlet vs. an unprotected outlet), defined by the vendor, or by end user configuration or usage. The `OutletGroup` schema and resource allows data to be gathered and actions performed on a per-group basis.

# 5 Schema reference guide

The power distribution-related schemas are listed in the following section for reference. This section should be considered a subset of 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).

Note that Redfish schemas are frequently updated to add new functionality, clarify definitions, or correct errata. The contents of this reference guide are current as of the publication date, but will not include schema updates published in later releases. Refer to the Redfish standards website for the latest release information.

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

## 5.1 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: https://www.dmtf.org/standards/redfish

## 5.2 Chassis 1.26.0

| **Version** | *v1.26* | *v1.25* | *v1.24* | *v1.23* | *v1.22* | *v1.21* | *v1.20* | *v1.19* | *v1.18* | *v1.17* | *v1.16* | ... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Release** | 2024.4 | 2023.3 | 2023.2 | 2023.1 | 2022.3 | 2022.2 | 2022.1 | 2021.4 | 2021.3 | 2021.2 | 2021.1 | ... |

### 5.2.1 Description

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. It also describes the location, such as a slot, socket, or bay, where a unit can be installed, by populating a resource instance with an absent state if a unit is not present.

### 5.2.2 URIs

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

### 5.2.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Assembly** *(v1.6+)* {} | object | | The link to the assembly associated with this chassis. See the *Assembly* schema for details on this property. |
| **AssetTag** | string | *read-write (null)* | The user-assigned asset tag of this chassis. |
| **Certificates** *(v1.15+)* { | object | | The link to a collection of certificates for device identity and attestation. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Certificate*. See the Certificate schema for details. |
| } | | | |
| **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.* |
| **Controls** *(v1.17+)* { | object | | The link to the collection of controls located in this chassis. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Control*. See the Control schema for details. |
| } | | | |
| **DepthMm** *(v1.4+)* | number (mm) | *read-only (null)* | The depth of the chassis. |
| **Doors** *(v1.24+)* { | object | | The doors or access panels of the chassis. |
| **Front** *(v1.24+)* {} | object | *(null)* | The front door of the chassis. For more information about this property, see Door in Property Details. |
| **Rear** *(v1.24+)* {} | object | *(null)* | The rear door of the chassis. For more information about this property, see Door in Property Details. |
| } | | | |
| **Drives** *(v1.14+)* { | object | | The link to the collection of drives within this chassis. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Drive*. See the Drive schema for details. |
| } | | | |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **ElectricalSourceManagerURIs** *(v1.18+)* [ ] | array (URI) (string, null) | *read-write* | The URIs of the management interfaces for the external electrical source connections for this chassis. |
| **ElectricalSourceNames** *(v1.18+)* [ ] | array (string, null) | *read-write* | The names of the external electrical sources, such as circuits or outlets, connected to this chassis. |
| **EnvironmentalClass** *(v1.9+)* | string (enum) | *read-write (null)* | The ASHRAE Environmental Class for this chassis. *For the possible property values, see EnvironmentalClass in Property details.* |
| **EnvironmentMetrics** *(v1.15+)* {} | object | | The link to the environment metrics for this chassis. See the *EnvironmentMetrics* schema for details on this property. |
| **FabricAdapters** *(v1.20+)* { | object | | The link to the collection of fabric adapters located in this chassis that provide access to fabric-related resource pools. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *FabricAdapter*. See the FabricAdapter schema for details. |
| } | | | |
| **HeatingCoolingEquipmentNames** *(v1.25+)* [ ] | array (string, null) | *read-write* | The names of the external heating or cooling equipment, such as coolant distribution units, connected to this chassis. |
| **HeatingCoolingManagerURIs** *(v1.25+)* [ ] | array (URI) (string, null) | *read-write* | The URIs of the management interfaces for the external heating or cooling equipment for this chassis. |
| **HeightMm** *(v1.4+)* | number (mm) | *read-only (null)* | The height of the chassis. |
| **HotPluggable** *(v1.21+)* | boolean | *read-only (null)* | An indication of whether this component can be inserted or removed while the equipment is in operation. |
| **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.* |
| **LeakDetectors** *(v1.26+)* { | object | | The link to the collection of leak detectors located in this chassis. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *LeakDetector*. See the LeakDetector schema for details. |
| } | | | |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Links** { | object | | The links to other resources that are related to this resource. |
| **Cables** *(v1.17+)* [ { } ] | array (object) | | An array of links to the cables connected to this chassis. See the *Cable* schema for details on this property. |
| **Cables@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ComputerSystems** [ { } ] | array (object) | | An array of links to the computer systems that this chassis directly and wholly contains. See the *ComputerSystem* schema for details on this property. |
| **ComputerSystems@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ConnectedCoolingLoops** *(v1.23+)* [ { } ] | array (object) | | An array of links to cooling loops connected to this chassis. See the *CoolingLoop* schema for details on this property. |
| **ConnectedCoolingLoops@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** *(deprecated v1.20)* [ { | 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. *Deprecated in v1.20 and later. This property has been deprecated in favor of the* `Fans` *link property, and details provided in the* `ThermalSubsystem` *resource.* |
| **@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. |
| **CoolingUnits** *(v1.23+)* [ { } ] | array (object) | | An array of links to cooling unit functionality contained in this chassis. See the *CoolingUnit* schema for details on this property. |
| **CoolingUnits@odata.count** | integer | *read-only* | The number of items in a collection. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Drives** *(v1.2+)* [ { } ] | array (object) | | An array of links to the drives located in this chassis. See the *Drive* schema for details on this property. |
| **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. See the *Facility* schema for details on this property. |
| **@odata.id** | string | *read-write* | Link to a Facility resource. See the Links section and the *Facility* schema for details. |
| } | | | |
| **Fans** *(v1.20+)* [ { } ] | array (object) | | An array of links to the fans that cool this chassis. See the *Fan* schema for details on this property. |
| **Fans@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ManagedBy** [ { } ] | array (object) | | An array of links to the managers responsible for managing this chassis. See the *Manager* schema for details on this property. |
| **ManagedBy@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ManagersInChassis** *(v1.2+)* [ { } ] | array (object) | | An array of links to the managers located in this chassis. See the *Manager* schema for details on this property. |
| **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 (object) | | An array of links to the PCIe devices located in this chassis. See the *PCIeDevice* schema for details on this property. *Deprecated in v1.10 and later. This property has been deprecated in favor of the* `PCIeDevices` *resource collection in the root of this resource.* |
| **PCIeDevices@odata.count** | integer | *read-only* | The number of items in a collection. |
| **PowerDistribution** *(v1.20+)* { | object | *(null)* | A link to power distribution functionality contained in this chassis. See the *PowerDistribution* schema for details on this property. |
| **@odata.id** | string | *read-only* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } | | | |
| **PowerOutlets** *(v1.18+)* [ { | array | | An array of links to the outlets that provide power to this chassis. |
| **@odata.id** | string | *read-write* | Link to a Outlet resource. See the Links section and the *Outlet* schema for details. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| } ] | | | |
| **PowerOutlets@odata.count** | integer | *read-only* | The number of items in a collection. |
| **PowerSupplies** *(v1.20+)* [ { } ] | array (object) | | An array of links to the power supplies that provide power to this chassis. See the *PowerSupply* schema for details on this property. |
| **PowerSupplies@odata.count** | integer | *read-only* | The number of items in a collection. |
| **PoweredBy** *(deprecated v1.20)* [ { | 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. *Deprecated in v1.20 and later. This property has been deprecated in favor of the* `PowerOutlets` *and* `PowerSupplies` *link properties, and details provided in the* `PowerSubsystem` *resource.* |
| **@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 (object) | | An array of links to the processors located in this chassis. See the *Processor* schema for details on this property. |
| **Processors@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ResourceBlocks** *(v1.5+)* [ { } ] | array (object) | | An array of links to the resource blocks located in this chassis. See the *ResourceBlock* schema for details on this property. |
| **ResourceBlocks@odata.count** | integer | *read-only* | The number of items in a collection. |
| **Storage** *(v1.2+)* [ { } ] | array (object) | | An array of links to the storage subsystems connected to or inside this chassis. See the *Storage* schema for details on this property. |
| **Storage@odata.count** | integer | *read-only* | The number of items in a collection. |
| **Switches** *(v1.7+)* [ { } ] | array (object) | | An array of links to the switches located in this chassis. See the *Switch* schema for details on this property. |
| **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. Contains a link to a resource. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **@odata.id** | string | *read-only* | Link to Collection of *LogService*. See the LogService schema for details. |
| } | | | |
| **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. |
| **Measurements** *(v1.15+, deprecated v1.19)* [ { } ] | array (object) | | An array of DSP0274-defined measurement blocks. See the *SoftwareInventory* schema for details on this property. *Deprecated in v1.19 and later. This property has been deprecated in favor of the* `ComponentIntegrity` *resource.* |
| **MediaControllers** *(v1.11+, deprecated v1.20)* { | object | | The link to the collection of media controllers located in this chassis. Contains a link to a resource. *Deprecated in v1.20 and later. This property has been deprecated in favor of* `FabricAdapters`. |
| **@odata.id** | string | *read-only* | Link to Collection of *MediaController*. See the MediaController schema for details. |
| } | | | |
| **Memory** *(v1.11+)* { | object | | The link to the collection of memory located in this chassis that belong to fabric-related resource pools. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Memory*. See the Memory schema for details. |
| } | | | |
| **MemoryDomains** *(v1.11+)* { | object | | The link to the collection of memory domains located in this chassis that belong to fabric-related resource pools. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *MemoryDomain*. See the MemoryDomain schema for details. |
| } | | | |
| **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. Contains a link to a resource. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **@odata.id** | string | *read-only* | Link to Collection of *NetworkAdapter*. See the NetworkAdapter schema for details. |
| } | | | |
| **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. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *PCIeDevice*. See the PCIeDevice schema for details. |
| } | | | |
| **PCIeSlots** *(v1.8+, deprecated v1.24)* {} | object | | The link to the PCIe slot properties for this chassis. See the *PCIeSlots* schema for details on this property. *Deprecated in v1.24 and later. This property has been deprecated in favor of the* `PCIeDevices` *property. The* `PCIeSlots` *schema has been deprecated in favor of the* `PCIeDevice` *schema. Empty PCIe slots are represented by* `PCIeDevice` *resources using the* `Absent` *value of the* `State` *property within* `Status`*.* |
| **PhysicalSecurity** *(v1.1+)* { | object | | The physical security state of the chassis. |
| **IntrusionSensor** *(v1.1+)* | string (enum) | *read-write (null)* | The physical security state of the chassis, such as if hardware intrusion is detected. *For the possible property values, see IntrusionSensor in Property details.* |
| **IntrusionSensorNumber** *(v1.1+, deprecated v1.22)* | integer | *read-only (null)* | A numerical identifier to represent the physical security sensor. *Deprecated in v1.22 and later. This property has been deprecated in order to allow for multiple physical sensors to construct this object.* |
| **IntrusionSensorReArm** *(v1.1+)* | string (enum) | *read-write (null)* | The policy that describes how the physical security state of the chassis returns to a 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. See the *Power* schema for details on this property. *Deprecated in v1.15 and later. This link has been deprecated in favor of the* `PowerSubsystem` *link property.* |
| **PoweredByParent** *(v1.20+)* | boolean | *read-only (null)* | Indicates that the chassis receives power from the containing chassis. |
| **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.* |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **PowerSubsystem** *(v1.15+)* {} | object | | The link to the power subsystem properties for this chassis. See the *PowerSubsystem* schema for details on this property. |
| **Processors** *(v1.22+)* { | object | | The link to the collection of processors located in this chassis that belong to fabric-related resource pools. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Processor*. See the Processor schema for details. |
| } | | | |
| **Replaceable** *(v1.21+)* | boolean | *read-only (null)* | An indication of whether this component can be independently replaced as allowed by the vendor's replacement policy. |
| **Sensors** *(v1.9+)* { | object | | The link to the collection of sensors located in the equipment and sub-components. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Sensor*. See the Sensor schema for details. |
| } | | | |
| **SerialNumber** | string | *read-only (null)* | The serial number of the chassis. |
| **SKU** | string | *read-only (null)* | The SKU of the chassis. |
| **SparePartNumber** *(v1.16+)* | string | *read-only (null)* | The spare part number 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. See the *Thermal* schema for details on this property. *Deprecated in v1.15 and later. This link has been deprecated in favor of the* `ThermalSubsystem` *link property.* |
| **ThermalDirection** *(v1.20+)* | string (enum) | *read-only (null)* | Indicates the thermal management path through the chassis. *For the possible property values, see ThermalDirection in Property details.* |
| **ThermalManagedByParent** *(v1.20+)* | boolean | *read-only (null)* | Indicates that the chassis is thermally managed by the parent chassis. |
| **ThermalSubsystem** *(v1.15+)* {} | object | | The link to the thermal subsystem properties for this chassis. See the *ThermalSubsystem* schema for details on this property. |
| **TrustedComponents** *(v1.21+)* { | object | | The link to the trusted components in this chassis. Contains a link to a resource. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **@odata.id** | string | *read-only* | Link to Collection of *TrustedComponent*. See the TrustedComponent schema for details. |
| } | | | |
| **UUID** *(v1.7+)* | string (uuid) | *read-only (null)* | The UUID for this chassis. |
| **Version** *(v1.21+)* | string | *read-only (null)* | The hardware version of 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. |

## 5.2.4 Actions

### 5.2.4.1 Reset

#### Description

This action resets the chassis. Additionally, it could reset systems or other contained resources depending on the `ResetType` used to invoke this action.

#### Action URI

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

#### Action parameters

| Parameter Name | Type | Attributes | Notes |
|---|---|---|---|
| **ResetType** | string (enum) | *optional* | The type of reset. *For the possible property values, see ResetType in Property details.* |

#### Request Example

```
{
    "ResetType": "ForceRestart"
```

```
}
```

## 5.2.5 Property details

### 5.2.5.1 ChassisType

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. |
| HeatExchanger *(v1.23+)* | A heat exchanger. |
| ImmersionTank *(v1.23+)* | An immersion cooling tank. |
| 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. |
| PowerStrip *(v1.25+)* | A power strip, typically placed in the zero-U space of a rack. |
| 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. |

| string | Description |
|---|---|
| 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 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. |

#### 5.2.5.2 Door

A door or access panel on the chassis.

| | | | |
|---|---|---|---|
| **DoorState** *(v1.24+)* | string (enum) | *read-only (null)* | The state of the door. *For the possible property values, see DoorState in Property details.* |
| **Locked** *(v1.24+)* | boolean | *read-write (null)* | Indicates if the door is locked. |
| **UserLabel** *(v1.24+)* | string | *read-write* | A user-assigned label. |

#### 5.2.5.3 DoorState

The state of the door.

| string | Description |
|---|---|
| Closed | Door is closed. |
| Locked | Door is closed and locked. |
| LockedAndOpen | Door is open and locked. |
| Open | Door is open. |

#### 5.2.5.4 EnvironmentalClass

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'. |

#### 5.2.5.5 IndicatorLED

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. *Deprecated in v1.2 and later. This value has been deprecated in favor of returning* `null` *if the state is unknown.* |

#### 5.2.5.6 IntrusionSensor

The physical security state of the chassis, such as if hardware intrusion is 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 physical security condition is detected at this time. |
| TamperingDetected | Physical tampering of the monitored entity is detected. |

#### 5.2.5.7 IntrusionSensorReArm

The policy that describes how the physical security state of the chassis returns to a normal state.

| string | Description |
|---|---|
| Automatic | The sensor is automatically restored to the normal state when no security condition is detected. |
| Manual | A user is required to clear the sensor to restore it to the normal state. |

#### 5.2.5.8 PowerState

The current power state of the chassis.

| string | Description |
|---|---|
| Off | The resource is powered off. The components within the resource might continue to have AUX power. |
| On | The resource is powered on. |
| Paused | The resource is paused. |
| PoweringOff | A temporary state between on and off. The components within the resource can take time to process the power off action. |
| PoweringOn | A temporary state between off and on. The components within the resource can take time to process the power on action. |

#### 5.2.5.9 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 unit. |
| FullPowerCycle | Full power cycle the unit. Behaves like removing utility lines, followed by restoring utility lines to the resource. |
| GracefulRestart | Shut down gracefully and restart the unit. |

| string | Description |
|---|---|
| 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. |
| Pause | Pause execution on the unit but do not remove power. This is typically a feature of virtual machine hypervisors. |
| PowerCycle | Power cycle the unit. Behaves like a power removal, followed by a power restore to the resource. |
| PushPowerButton | Simulate the pressing of the physical power button on this unit. |
| Resume | Resume execution on the paused unit. This is typically a feature of virtual machine hypervisors. |
| Suspend | Write the state of the unit to disk before powering off. This allows for the state to be restored when powered back on. |

#### 5.2.5.10 ThermalDirection

Indicates the thermal management path through the chassis.

| string | Description |
|---|---|
| BackToFront | A chassis with the air intake in the back and exhaust out the front. |
| FrontToBack | A chassis with the air intake in the front and exhaust out the back. |
| Sealed | A sealed chassis with no air pathway. |
| TopExhaust | A chassis with air exhaust on the top. |

### 5.2.6 Example response


```
{
    "@odata.type": "#Chassis.v1_26_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"
    },
    "EnvironmentMetrics": {
        "@odata.id": "/redfish/v1/Chassis/1U/EnvironmentMetrics"
    },
    "Links": {
        "ComputerSystems": [
            {
                "@odata.id": "/redfish/v1/Systems/437XR1138R2"
            }
        ],
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
        ],
        "ManagersInChassis": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
        ]
    },
```

```
    "@odata.id": "/redfish/v1/Chassis/1U"
}
```

## 5.3 Circuit 1.8.1

| Version | *v1.8* | *v1.7* | *v1.6* | *v1.5* | *v1.4* | *v1.3* | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|---|---|---|---|---|---|
| **Release** | 2024.1 | 2022.2 | 2022.1 | 2021.4 | 2021.3 | 2021.2 | 2020.4 | 2020.3 | 2019.4 |

### 5.3.1 Description

This `Circuit` schema contains the definition for an electrical circuit.

### 5.3.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Subfeeds/*{CircuitId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Feeders/*{CircuitId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Mains/*{CircuitId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Subfeeds/*{CircuitId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Branches/*{CircuitId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Feeders/*{CircuitId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Mains/*{CircuitId}*

### 5.3.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **BreakerState** | string (enum) | *read-only (null)* | The state of the overcurrent protection device. *For the possible property values, see BreakerState in Property details.* |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **CircuitType** | string (enum) | *read-only (null)* | The type of circuit. *For the possible property values, see CircuitType in Property details.* |
| **ConfigurationLocked** *(v1.5+)* | boolean | *read-write* | Indicates whether the configuration is locked. |
| **CriticalCircuit** | boolean | *read-write (null)* | Designates if this is a critical circuit. |
| **CurrentAmps** {} | object | | The current (A) for this circuit. For more information about this property, see SensorCurrentExcerpt in Property Details. |
| **ElectricalConsumerNames** *(v1.4+)* [ ] | array (string, null) | *read-write* | An array of names of downstream devices that are powered by this circuit. |
| **ElectricalContext** | string (enum) | *read-only (null)* | The combination of current-carrying conductors. *For the possible property values, see ElectricalContext in Property details.* |
| **ElectricalSourceManagerURI** *(v1.4+)* | string (URI) | *read-write* | The URI of the management interface for the upstream electrical source connection for this circuit. |
| **ElectricalSourceName** *(v1.4+)* | string | *read-write* | The name of the upstream electrical source, such as a circuit or outlet, connected to this circuit. |
| **EnergykWh** {} | object | | The energy (kWh) for this circuit. For more information about this property, see SensorEnergykWhExcerpt in Property Details. |
| **FrequencyHz** {} | object | | The frequency (Hz) for this circuit. For more information about this property, see SensorExcerpt in Property Details. |
| **IndicatorLED** *(deprecated v1.1)* | string (enum) | *read-write (null)* | The state of the indicator LED, which identifies the circuit. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.1 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. |
| **BranchCircuit** { | object | *(null)* | A reference to the branch circuit related to this circuit. |
| **@odata.id** | string | *read-only* | Link to another Circuit resource. |
| } | | | |
| **DistributionCircuits** *(v1.4+)* [ { | array | | An array of links to the circuits powered by this circuit. |
| **@odata.id** | string | *read-write* | Link to another Circuit resource. |
| } ] | | | |
| **DistributionCircuits@odata.count** | integer | *read-only* | The number of items in a collection. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Oem** {} | object | | The OEM extension property. See the *Resource* schema for details on this property. |
| **Outlets** [ { | array | | An array of references to the outlets contained by this circuit. |
| **@odata.id** | string | *read-only* | Link to a Outlet resource. See the Links section and the *Outlet* schema for details. |
| } ] | | | |
| **Outlets@odata.count** | integer | *read-only* | The number of items in a collection. |
| **PowerOutlet** *(v1.4+)* { | object | *(null)* | A link to the power outlet that provides power to this circuit. See the *Outlet* schema for details on this property. |
| **@odata.id** | string | *read-write* | Link to a Outlet resource. See the Links section and the *Outlet* schema for details. |
| } | | | |
| **SourceCircuit** *(v1.4+)* { | object | *(null)* | A link to the circuit that provides power to this circuit. |
| **@odata.id** | string | *read-write* | Link to another Circuit resource. |
| } | | | |
| } | | | |
| **LocationIndicatorActive** *(v1.1+)* | boolean | *read-write* *(null)* | An indicator allowing an operator to physically locate this resource. |
| **NominalFrequencyHz** *(v1.8+)* | number | *read-only* *(null)* | The nominal frequency (Hz) for this circuit. |
| **NominalVoltage** | string (enum) | *read-only* *(null)* | The nominal voltage for this circuit. *For the possible property values, see NominalVoltage in Property details.* |
| **PhaseWiringType** | string (enum) | *read-only* *(null)* | The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). *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.* |
| **PolyPhaseCurrentAmps** { | object | *(null)* | The current readings for this circuit. |
| **Line1** {} | object | | Line 1 current (A). For more information about this property, see SensorCurrentExcerpt in Property Details. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Line2** {} | object | | Line 2 current (A). For more information about this property, see SensorCurrentExcerpt in Property Details. |
| **Line3** {} | object | | Line 3 current (A). For more information about this property, see SensorCurrentExcerpt in Property Details. |
| **Neutral** {} | object | | Neutral line current (A). For more information about this property, see SensorCurrentExcerpt in Property Details. |
| } | | | |
| **PolyPhaseEnergykWh** { | object | *(null)* | The energy readings for this circuit. |
| **Line1ToLine2** {} | object | | The Line 1 to Line 2 energy (kWh) for this circuit. For more information about this property, see SensorEnergykWhExcerpt in Property Details. |
| **Line1ToNeutral** {} | object | | The Line 1 to Neutral energy (kWh) for this circuit. For more information about this property, see SensorEnergykWhExcerpt in Property Details. |
| **Line2ToLine3** {} | object | | The Line 2 to Line 3 energy (kWh) for this circuit. For more information about this property, see SensorEnergykWhExcerpt in Property Details. |
| **Line2ToNeutral** {} | object | | The Line 2 to Neutral energy (kWh) for this circuit. For more information about this property, see SensorEnergykWhExcerpt in Property Details. |
| **Line3ToLine1** {} | object | | The Line 3 to Line 1 energy (kWh) for this circuit. For more information about this property, see SensorEnergykWhExcerpt in Property Details. |
| **Line3ToNeutral** {} | object | | The Line 3 to Neutral energy (kWh) for this circuit. For more information about this property, see SensorEnergykWhExcerpt in Property Details. |
| } | | | |
| **PolyPhasePowerWatts** { | object | *(null)* | The power readings for this circuit. |
| **Line1ToLine2** {} | object | | The Line 1 to Line 2 power (W) for this circuit. For more information about this property, see SensorPowerExcerpt in Property Details. |
| **Line1ToNeutral** {} | object | | The Line 1 to Neutral power (W) for this circuit. For more information about this property, see SensorPowerExcerpt in Property Details. |
| **Line2ToLine3** {} | object | | The Line 2 to Line 3 power (W) for this circuit. For more information about this property, see SensorPowerExcerpt in Property Details. |
| **Line2ToNeutral** {} | object | | The Line 2 to Neutral power (W) for this circuit. For more information about this property, see SensorPowerExcerpt in Property Details. |
| **Line3ToLine1** {} | object | | The Line 3 to Line 1 power (W) for this circuit. For more information about this property, see SensorPowerExcerpt in Property Details. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Line3ToNeutral** {} | object | | The Line 3 to Neutral power (W) for this circuit. For more information about this property, see SensorPowerExcerpt in Property Details. |
| } | | | |
| **PolyPhaseVoltage** { | object | *(null)* | The voltage readings for this circuit. |
| **Line1ToLine2** {} | object | | The Line 1 to Line 2 voltage (V) for this circuit. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line1ToNeutral** {} | object | | The Line 1 to Neutral voltage (V) for this circuit. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line2ToLine3** {} | object | | The Line 2 to Line 3 voltage (V) for this circuit. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line2ToNeutral** {} | object | | The Line 2 to Neutral voltage (V) for this circuit. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line3ToLine1** {} | object | | The Line 3 to Line 1 voltage (V) for this circuit. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line3ToNeutral** {} | object | | The Line 3 to Neutral voltage (V) for this circuit. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| } | | | |
| **PowerControlLocked** *(v1.5+)* | boolean | *read-write* | Indicates whether power control requests are locked. |
| **PowerCycleDelaySeconds** | number | *read-write* *(null)* | The number of seconds to delay power on after a `PowerControl` action to cycle power. Zero seconds indicates no delay. |
| **PowerEnabled** | boolean | *read-only* *(null)* | Indicates if the circuit can be powered. |
| **PowerLoadPercent** *(v1.3+)* {} | object | | The power load (percent) for this circuit. For more information about this property, see SensorExcerpt in Property Details. |
| **PowerOffDelaySeconds** | number | *read-write* *(null)* | The number of seconds to delay power off after a `PowerControl` action. Zero seconds indicates no delay to power off. |
| **PowerOnDelaySeconds** | number | *read-write* *(null)* | The number of seconds to delay power up after a power cycle or a `PowerControl` action. Zero seconds indicates no delay to power up. |
| **PowerRestoreDelaySeconds** | number | *read-write* *(null)* | The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. |
| **PowerRestorePolicy** | string (enum) | *read-write* | The desired power state of the circuit when power is restored after a power loss. *For the possible property values, see PowerRestorePolicy in Property details.* |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **PowerState** | string (enum) | *read-only (null)* | The power state of the circuit. *For the possible property values, see PowerState in Property details.* |
| **PowerStateInTransition** *(v1.5+)* | boolean | *read-only* | Indicates whether the power state is undergoing a delayed transition. |
| **PowerWatts** {} | object | | The power (W) for this circuit. For more information about this property, see SensorPowerExcerpt in Property Details. |
| **RatedCurrentAmps** | number (A) | *read-only (null)* | The rated maximum current allowed for this circuit. |
| **Status** {} | object | | The status and health of the resource and its subordinate or dependent resources. See the *Resource* schema for details on this property. |
| **UnbalancedCurrentPercent** *(v1.5+)* {} | object | | The current imbalance (percent) between phases. For more information about this property, see SensorExcerpt in Property Details. |
| **UnbalancedVoltagePercent** *(v1.5+)* {} | object | | The voltage imbalance (percent) between phases. For more information about this property, see SensorExcerpt in Property Details. |
| **UserLabel** *(v1.4+)* | string | *read-write* | A user-assigned label. |
| **Voltage** {} | object | | The voltage (V) for this circuit. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **VoltageType** | string (enum) | *read-only (null)* | The type of voltage applied to the circuit. *For the possible property values, see VoltageType in Property details.* |

## 5.3.4 Actions

### 5.3.4.1 BreakerControl

**Description**

This action attempts to reset the circuit breaker.

**Action URI**

*{Base URI of target resource}*/Actions/Circuit.BreakerControl

**Action parameters**

| Parameter Name | Type | Attributes | Notes |
|---|---|---|---|
| **PowerState** | string (enum) | *optional* | The desired power state of the circuit if the breaker is reset successfully. *For the possible property values, see PowerState in Property details.* |

**Request Example**

```
{
    "PowerState": "On"
}
```

#### 5.3.4.2 PowerControl

**Description**

This action turns the circuit on or off.

**Action URI**

*{Base URI of target resource}*/Actions/Circuit.PowerControl

**Action parameters**

| Parameter Name | Type | Attributes | Notes |
|---|---|---|---|
| **PowerState** | string (enum) | *optional* | The desired power state of the circuit. *For the possible property values, see PowerState in Property details.* |

**Request Example**

```
{
    "PowerState": "Off"
}
```

#### 5.3.4.3 ResetMetrics

**Description**

This action resets metrics related to this circuit.

**Action URI**

*{Base URI of target resource}*/Actions/Circuit.ResetMetrics

**Action parameters**

This action takes no parameters.

## 5.3.5 Property details

### 5.3.5.1 BreakerState

The state of the overcurrent protection device.

| string | Description |
|---|---|
| Normal | The breaker is powered on. |
| Off | The breaker is off. |
| Tripped | The breaker has been tripped. |

### 5.3.5.2 CircuitType

The type of circuit.

| string | Description |
|---|---|
| Branch | A branch (output) circuit. |
| Bus *(v1.3+)* | An electrical bus circuit. |
| Feeder | A feeder (output) circuit. |
| Mains | A mains input or utility circuit. |
| Subfeed | A subfeed (output) circuit. |

### 5.3.5.3 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 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. |

#### 5.3.5.4 IndicatorLED

The state of the indicator LED, which identifies the circuit.

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

#### 5.3.5.5 NominalVoltage

The nominal voltage for this circuit.

| string | Description |
|---|---|
| AC100To127V *(v1.6+)* | AC 100-127V nominal. |
| 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. |
| DC12V *(v1.7+)* | DC 12V nominal. |
| DC16V *(v1.7+)* | DC 16V nominal. |
| DC1_8V *(v1.7+)* | DC 1.8V nominal. |
| DC240V | DC 240V nominal. |
| DC380V | High-voltage DC (380V). |
| DC3_3V *(v1.7+)* | DC 3.3V nominal. |
| DC48V *(v1.2+)* | DC 48V nominal. |
| DC5V *(v1.7+)* | DC 5V nominal. |
| DC9V *(v1.7+)* | DC 9V nominal. |

| string | Description |
| --- | --- |
| DCNeg48V | -48V DC. |

#### 5.3.5.6 PhaseWiringType

The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

| 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). |

#### 5.3.5.7 PlugType

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). |
| 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). |

| string | Description |
|---|---|
| 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). |

#### 5.3.5.8 PowerRestorePolicy

The desired power state of the circuit when power is restored after a power loss.

| string | Description |
|---|---|
| AlwaysOff | Always remain powered off when external power is applied. |
| AlwaysOn | Always power on when external power is applied. |
| LastState | Return to the last power state (on or off) when external power is applied. |

#### 5.3.5.9 PowerState

##### 5.3.5.9.1 In top level:

The power state of the circuit.

| string | Description |
|---|---|
| Off | The resource is powered off. The components within the resource might continue to have AUX power. |
| On | The resource is powered on. |
| Paused | The resource is paused. |
| PoweringOff | A temporary state between on and off. The components within the resource can take time to process the power off action. |
| PoweringOn | A temporary state between off and on. The components within the resource can take time to process the power on action. |

##### 5.3.5.9.2 In Actions: BreakerControl, Actions: PowerControl:

The desired power state of the circuit if the breaker is reset successfully.

| string | Description |
|---|---|
| Off | Power off. |
| On | Power on. |
| PowerCycle *(v1.5+)* | Power cycle. |

#### 5.3.5.10 SensorCurrentExcerpt

The `Sensor` schema describes a sensor and its properties. 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 percent (% THD). |

#### 5.3.5.11 SensorEnergykWhExcerpt

The `Sensor` schema describes a sensor and its properties. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri.

| | | | |
|---|---|---|---|
| **ApparentkVAh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Apparent energy (kVAh). |
| **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. |
| **ReactivekVARh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Reactive energy (kVARh). |
| **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. |

#### 5.3.5.12 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. 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. |

#### 5.3.5.13 SensorPowerExcerpt

The `Sensor` schema describes a sensor and its properties. 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. |
| **PhaseAngleDegrees** *(v1.5+)* | number | *read-only (null)* | The phase angle (degrees) between the current and voltage waveforms. |
| **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 apparent VA and squared power (Reading) for a circuit, in VAR units. |
| **Reading** | number | *read-only (null)* | The sensor value. |

#### 5.3.5.14 SensorVoltageExcerpt

The `Sensor` schema describes a sensor and its properties. 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 percent (% THD). |

#### 5.3.5.15 VoltageType

The type of voltage applied to the circuit.

| string | Description |
|---|---|
| AC | Alternating Current (AC) circuit. |
| DC | Direct Current (DC) circuit. |

### 5.3.6 Example response

```
{
    "@odata.type": "#Circuit.v1_8_1.Circuit",
    "Id": "A",
    "Name": "Branch Circuit A",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "CircuitType": "Branch",
    "PhaseWiringType": "TwoPhase3Wire",
```

```
    "NominalVoltage": "AC200To240V",
    "RatedCurrentAmps": 16,
    "BreakerState": "Normal",
    "PolyPhaseVoltage": {
        "Line1ToNeutral": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/VoltageAL1N",
            "Reading": 118.2
        },
        "Line1ToLine2": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/VoltageAL1L2",
            "Reading": 203.5
        }
    },
    "CurrentAmps": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/CurrentA",
        "Reading": 5.19
    },
    "PolyPhaseCurrentAmps": {
        "Line1": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/CurrentA",
            "Reading": 5.19
        }
    },
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PowerA",
        "Reading": 937.4,
        "ApparentVA": 937.4,
        "ReactiveVAR": 0,
        "PowerFactor": 1
    },
    "PolyPhasePowerWatts": {
        "Line1ToNeutral": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PowerA1",
            "Reading": 937.4,
            "PeakReading": 1000.5,
            "ApparentVA": 937.4,
            "ReactiveVAR": 0,
            "PowerFactor": 1
        }
    },
    "FrequencyHz": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/FrequencyA",
        "Reading": 60
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/EnergyA",
        "Reading": 325675
    },
    "Links": {
        "Outlets": [
```

```
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
            },
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A2"
            },
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A3"
            }
        ]
    },
    "Actions": {
        "#Circuit.BreakerControl": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A/Circuit.BreakerControl"
        },
        "#Circuit.ResetMetrics": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A/Circuit.ResetMetrics"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A"
}
```


## 5.4 Facility 1.4.2

| **Version** | *v1.4* | *v1.3* | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|---|---|
| **Release** | 2023.1 | 2021.3 | 2021.2 | 2020.4 | 2019.4 |

### 5.4.1 Description

The `Facility` schema represents the physical location containing equipment, such as a room, building, or campus.

### 5.4.2 URIs

/redfish/v1/Facilities/*{FacilityId}*

### 5.4.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **AmbientMetrics** *(v1.1+)* {} | object | | The link to the ambient environment metrics for this facility. See the *EnvironmentMetrics* schema for details on this property. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **EnvironmentMetrics** *(v1.1+)* {} | object | | The link to the environment metrics for this facility. See the *EnvironmentMetrics* schema for details on this property. |
| **FacilityType** | string (enum) | *read-only required* | The type of location this resource represents. *For the possible property values, see FacilityType in Property details.* |
| **Links** { | object | | The links to other resources that are related to this resource. |
| **CDUs** *(v1.4+)* [ { } ] | array (object) | | An array of links to the coolant distribution units in this facility. See the *CoolingUnit* schema for details on this property. |
| **CDUs@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ContainedByFacility** { | object | | The link to the facility that contains this facility. |
| **@odata.id** | string | *read-write* | Link to another Facility resource. |
| } | | | |
| **ContainsChassis** [ { | array | | An array of links to the outermost chassis contained within this facility. |
| **@odata.id** | string | *read-write* | Link to a Chassis resource. See the Links section and the *Chassis* schema for details. |
| } ] | | | |
| **ContainsChassis@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ContainsFacilities** [ { | array | | An array of links to other facilities contained within this facility. |
| **@odata.id** | string | *read-write* | Link to another Facility resource. |
| } ] | | | |
| **ContainsFacilities@odata.count** | integer | *read-only* | The number of items in a collection. |
| **CoolingLoops** *(v1.4+)* [ { } ] | array (object) | | An array of links to the cooling loops in this facility. See the *CoolingLoop* schema for details on this property. |
| **CoolingLoops@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ElectricalBuses** *(v1.3+)* [ { | array | | An array of links to the electrical buses in this facility. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **ElectricalBuses@odata.count** | integer | *read-only* | The number of items in a collection. |
| **FloorPDUs** [ { | array | | An array of links to the floor power distribution units in this facility. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **FloorPDUs@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ImmersionUnits** *(v1.4+)* [ { } ] | array (object) | | An array of links to the immersion cooling units in this facility. See the *CoolingUnit* schema for details on this property. |
| **ImmersionUnits@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ManagedBy** [ { } ] | array (object) | | An array of links to the managers responsible for managing this facility. See the *Manager* schema for details on this property. |
| **ManagedBy@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. |
| **PowerShelves** *(v1.2+)* [ { | array | | An array of links to the power shelves in this facility. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **PowerShelves@odata.count** | integer | *read-only* | The number of items in a collection. |
| **RackPDUs** [ { | array | | An array of links to the rack-level power distribution units in this facility. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **RackPDUs@odata.count** | integer | *read-only* | The number of items in a collection. |
| **Switchgear** [ { | array | | An array of links to the switchgear in this facility. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **Switchgear@odata.count** | integer | *read-only* | The number of items in a collection. |
| **TransferSwitches** [ { | array | | An array of links to the transfer switches in this facility. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| } ] | | | |
| **TransferSwitches@odata.count** | integer | *read-only* | The number of items in a collection. |
| } | | | |
| **Location** {} | object | | The location of the facility. See the *Resource* schema for details on this property. |
| **PowerDomains** { | object | | Link to the power domains in this facility. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *PowerDomain*. See the PowerDomain schema for details. |
| } | | | |
| **Status** {} | object | | The status and health of the resource and its subordinate or dependent resources. See the *Resource* schema for details on this property. |

## 5.4.4 Property details

### 5.4.4.1 FacilityType

The type of location this resource represents.

| string | Description |
|---|---|
| Building | A structure with a roof and walls. |
| Floor | A floor inside of a building. |
| Room | A room inside of a building or floor. |
| Site | A small area consisting of several buildings. |

## 5.4.5 Example response


```
{
    "@odata.type": "#Facility.v1_4_2.Facility",
    "Id": "Room237",
    "Name": "Room #237, 2nd Floor",
    "FacilityType": "Room",
    "Status": {
        "State": "Enabled",
```

```
        "Health": "OK"
    },
    "Location": {
        "PhysicalAddress": {
            "Country": "US",
            "StateOrProvince": "Oregon",
            "City": "Portland",
            "StreetAddress": "1001 SW 5th Avenue",
            "PostalCode": "97204",
            "ISOCountryCode": "USA",
            "ISOSubdivisionCode": "OR"
        }
    },
    "PowerDomains": {
        "@odata.id": "/redfish/v1/Facilities/Room237/PowerDomains"
    },
    "Links": {
        "ContainedByFacility": {
            "@odata.id": "/redfish/v1/Facilities/Building"
        },
        "RackPDUs": [
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Facilities/Room237"
}
```


## 5.5 Outlet 1.4.4

| **Version** | *v1.4* | *v1.3* | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|---|---|
| **Release** | 2021.4 | 2021.3 | 2021.2 | 2020.3 | 2019.4 |

### 5.5.1 Description

The `Outlet` schema contains a definition for an electrical outlet.

### 5.5.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Outlets/*{OutletId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Outlets/*{OutletId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Outlets/*{OutletId}*

/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Outlets/*{OutletId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Outlets/*{OutletId}*

### 5.5.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **ConfigurationLocked** *(v1.4+)* | boolean | *read-write* | Indicates whether the configuration is locked. |
| **CurrentAmps** {} | object | | The current (A) for this outlet. For more information about this property, see SensorCurrentExcerpt in Property Details. |
| **ElectricalConsumerNames** *(v1.3+)* [ ] | array (string, null) | *read-write* | An array of names of downstream devices that are powered by this outlet. |
| **ElectricalContext** | string (enum) | *read-only (null)* | The combination of current-carrying conductors. *For the possible property values, see ElectricalContext in Property details.* |
| **EnergykWh** { | object (excerpt) | | The energy (kWh) for this outlet. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri. |
| **ApparentkVAh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Apparent energy (kVAh). |
| **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. |
| **ReactivekVARh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Reactive energy (kVARh). |
| **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. |
| } | | | |
| **FrequencyHz** {} | object | | The frequency (Hz) for this outlet. For more information about this property, see SensorExcerpt in Property Details. |
| **IndicatorLED** *(deprecated v1.1)* | string (enum) | *read-write (null)* | The state of the indicator LED, which identifies the outlet. *For the possible property values, see IndicatorLED in Property details. Deprecated in v1.1 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. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **BranchCircuit** { | object | *(null)* | A reference to the branch circuit related to this outlet. See the *Circuit* schema for details on this property. |
| **@odata.id** | string | *read-only* | Link to a Circuit resource. See the Links section and the *Circuit* schema for details. |
| } | | | |
| **Chassis** *(v1.3+)* [ { | array | | Any array of links to chassis connected to this outlet. |
| **@odata.id** | string | *read-write* | Link to a Chassis resource. See the Links section and the *Chassis* schema for details. |
| } ] | | | |
| **Chassis@odata.count** | integer | *read-only* | The number of items in a collection. |
| **DistributionCircuits** *(v1.3+)* [ { | array | | An array of links to mains or input circuits powered by this outlet. |
| **@odata.id** | string | *read-write* | Link to a Circuit resource. See the Links section and the *Circuit* schema for details. |
| } ] | | | |
| **DistributionCircuits@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. |
| **PowerSupplies** *(v1.3+)* [ { } ] | array (object) | | An array of links to the power supplies connected to this outlet. See the *PowerSupply* schema for details on this property. |
| **PowerSupplies@odata.count** | integer | *read-only* | The number of items in a collection. |
| } | | | |
| **LocationIndicatorActive** *(v1.1+)* | boolean | *read-write (null)* | An indicator allowing an operator to physically locate this resource. |
| **NominalVoltage** | string (enum) | *read-only (null)* | The nominal voltage for this outlet. *For the possible property values, see NominalVoltage in Property details.* |
| **OutletType** | string (enum) | *read-only (null)* | The type of receptacle according to NEMA, IEC, or regional standards. *For the possible property values, see OutletType in Property details.* |
| **PhaseWiringType** | string (enum) | *read-only (null)* | The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires). *For the possible property values, see PhaseWiringType in Property details.* |
| **PolyPhaseCurrentAmps** { | object | *(null)* | The current readings for this outlet. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Line1** {} | object | | Line 1 current (A). For more information about this property, see SensorCurrentExcerpt in Property Details. |
| **Line2** {} | object | | Line 2 current (A). For more information about this property, see SensorCurrentExcerpt in Property Details. |
| **Line3** {} | object | | Line 3 current (A). For more information about this property, see SensorCurrentExcerpt in Property Details. |
| **Neutral** {} | object | | Neutral line current (A). For more information about this property, see SensorCurrentExcerpt in Property Details. |
| } | | | |
| **PolyPhaseVoltage** { | object | *(null)* | The voltage readings for this outlet. |
| **Line1ToLine2** {} | object | | The Line 1 to Line 2 voltage (V) for this outlet. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line1ToNeutral** {} | object | | The Line 1 to Neutral voltage (V) for this outlet. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line2ToLine3** {} | object | | The Line 2 to Line 3 voltage (V) for this outlet. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line2ToNeutral** {} | object | | The Line 2 to Neutral voltage (V) for this outlet. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line3ToLine1** {} | object | | The Line 3 to Line 1 voltage (V) for this outlet. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **Line3ToNeutral** {} | object | | The Line 3 to Neutral voltage (V) for this outlet. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| } | | | |
| **PowerControlLocked** *(v1.4+)* | boolean | *read-write* | Indicates whether power control requests are locked. |
| **PowerCycleDelaySeconds** | number | *read-write* *(null)* | The number of seconds to delay power on after a `PowerControl` action to cycle power. Zero seconds indicates no delay. |
| **PowerEnabled** | boolean | *read-only* *(null)* | Indicates if the outlet can be powered. |
| **PowerLoadPercent** *(v1.2+)* {} | object | | The power load (percent) for this outlet. For more information about this property, see SensorExcerpt in Property Details. |
| **PowerOffDelaySeconds** | number | *read-write* *(null)* | The number of seconds to delay power off after a `PowerControl` action. Zero seconds indicates no delay to power off. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **PowerOnDelaySeconds** | number | *read-write (null)* | The number of seconds to delay power up after a power cycle or a `PowerControl` action. Zero seconds indicates no delay to power up. |
| **PowerRestoreDelaySeconds** | number | *read-write (null)* | The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. |
| **PowerRestorePolicy** | string (enum) | *read-write* | The desired power state of the outlet when power is restored after a power loss. *For the possible property values, see PowerRestorePolicy in Property details.* |
| **PowerState** | string (enum) | *read-only (null)* | The power state of the outlet. *For the possible property values, see PowerState in Property details.* |
| **PowerStateInTransition** *(v1.4+)* | boolean | *read-only* | Indicates whether the power state is undergoing a delayed transition. |
| **PowerWatts** { | object (excerpt) | | The power (W) for this outlet. 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. |
| **PhaseAngleDegrees** *(v1.5+)* | number | *read-only (null)* | The phase angle (degrees) between the current and voltage waveforms. |
| **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 apparent VA and squared power (Reading) for a circuit, in VAR units. |
| **Reading** | number | *read-only (null)* | The sensor value. |
| } | | | |
| **RatedCurrentAmps** | number (A) | *read-only (null)* | The rated maximum current allowed for this outlet. |
| **Status** {} | object | | The status and health of the resource and its subordinate or dependent resources. See the *Resource* schema for details on this property. |
| **UserLabel** *(v1.3+)* | string | *read-write* | A user-assigned label. |
| **Voltage** {} | object | | The voltage (V) for this outlet. For more information about this property, see SensorVoltageExcerpt in Property Details. |
| **VoltageType** | string (enum) | *read-only (null)* | The type of voltage applied to the outlet. *For the possible property values, see VoltageType in Property details.* |

## 5.5.4 Actions

### 5.5.4.1 PowerControl

**Description**

This action turns the outlet on or off.

**Action URI**

*{Base URI of target resource}*/Actions/Outlet.PowerControl

**Action parameters**

| Parameter Name | Type | Attributes | Notes |
|---|---|---|---|
| **PowerState** | string (enum) | *optional* | The desired power state of the outlet. *For the possible property values, see PowerState in Property details.* |

**Request Example**

```
{
    "PowerState": "PowerCycle"
}
```

### 5.5.4.2 ResetMetrics

**Description**

This action resets metrics related to this outlet.

**Action URI**

*{Base URI of target resource}*/Actions/Outlet.ResetMetrics

**Action parameters**

This action takes no parameters.

## 5.5.5 Property details

### 5.5.5.1 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 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. |

### 5.5.5.2 IndicatorLED

The state of the indicator LED, which identifies the outlet.

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

#### 5.5.5.3 NominalVoltage

The nominal voltage for this outlet.

| string | Description |
|---|---|
| AC100To127V | AC 100-127V nominal. |
| 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. |
| DC12V | DC 12V nominal. |
| DC16V | DC 16V nominal. |
| DC1_8V | DC 1.8V nominal. |
| DC240V | DC 240V nominal. |
| DC380V | High-voltage DC (380V). |

| string | Description |
|---|---|
| DC3_3V | DC 3.3V nominal. |
| DC48V | DC 48V nominal. |
| DC5V | DC 5V nominal. |
| DC9V | DC 9V nominal. |
| DCNeg48V | -48V DC. |

#### 5.5.5.4 OutletType

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

| string | Description |
|---|---|
| BS_1363_Type_G | BS 1363 Type G (250V; 13A). |
| BusConnection *(v1.3+)* | Electrical bus connection. |
| CEE_7_Type_E | CEE 7/7 Type E (250V; 16A). |
| CEE_7_Type_F | CEE 7/7 Type F (250V; 16A). |
| IEC_60320_C13 | IEC C13 (250V; 10A or 15A). |
| IEC_60320_C19 | IEC C19 (250V; 16A or 20A). |
| NEMA_5_15R | NEMA 5-15R (120V; 15A). |
| NEMA_5_20R | NEMA 5-20R (120V; 20A). |
| NEMA_L5_20R | NEMA L5-20R (120V; 20A). |
| NEMA_L5_30R | NEMA L5-30R (120V; 30A). |
| NEMA_L6_20R | NEMA L6-20R (250V; 20A). |
| NEMA_L6_30R | NEMA L6-30R (250V; 30A). |
| SEV_1011_TYPE_12 | SEV 1011 Type 12 (250V; 10A). |
| SEV_1011_TYPE_23 | SEV 1011 Type 23 (250V; 16A). |

#### 5.5.5.5 PhaseWiringType

The number of ungrounded current-carrying conductors (phases) and the total number of conductors (wires).

| 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). |

#### 5.5.5.6 PowerRestorePolicy

The desired power state of the outlet when power is restored after a power loss.

| string | Description |
| --- | --- |
| AlwaysOff | Always remain powered off when external power is applied. |
| AlwaysOn | Always power on when external power is applied. |
| LastState | Return to the last power state (on or off) when external power is applied. |

#### 5.5.5.7 PowerState

##### 5.5.5.7.1 In top level:

The power state of the outlet.

| string | Description |
| --- | --- |
| Off | The resource is powered off. The components within the resource might continue to have AUX power. |
| On | The resource is powered on. |
| Paused | The resource is paused. |
| PoweringOff | A temporary state between on and off. The components within the resource can take time to process the power off action. |
| PoweringOn | A temporary state between off and on. The components within the resource can take time to process the power on action. |

##### 5.5.5.7.2 In Actions: PowerControl:

The desired power state of the outlet.

| string | Description |
|---|---|
| Off | Power off. |
| On | Power on. |
| PowerCycle | Power cycle. |

### 5.5.5.8 SensorCurrentExcerpt

The `Sensor` schema describes a sensor and its properties. 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 percent (% THD). |

### 5.5.5.9 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. 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. |

#### 5.5.5.10 SensorVoltageExcerpt

The `Sensor` schema describes a sensor and its properties. 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 percent (% THD). |

#### 5.5.5.11 VoltageType

The type of voltage applied to the outlet.

| string | Description |
|---|---|
| AC | Alternating Current (AC) outlet. |
| DC | Direct Current (DC) outlet. |

### 5.5.6 Example response


```
{
    "@odata.type": "#Outlet.v1_4_4.Outlet",
    "Id": "A1",
    "Name": "Outlet A1, Branch Circuit A",
    "Status": {
```

```
        "Health": "OK",
        "State": "Enabled"
    },
    "PhaseWiringType": "OnePhase3Wire",
    "VoltageType": "AC",
    "OutletType": "NEMA_5_20R",
    "RatedCurrentAmps": 20,
    "NominalVoltage": "AC120V",
    "LocationIndicatorActive": true,
    "PowerOnDelaySeconds": 4,
    "PowerOffDelaySeconds": 0,
    "PowerState": "On",
    "PowerEnabled": true,
    "Voltage": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/VoltageA1",
        "Reading": 117.5
    },
    "PolyPhaseVoltage": {
        "Line1ToNeutral": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/VoltageA1",
            "Reading": 117.5
        }
    },
    "CurrentAmps": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/CurrentA1",
        "Reading": 1.68
    },
    "PolyPhaseCurrentAmps": {
        "Line1": {
            "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/CurrentA1",
            "Reading": 1.68
        }
    },
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PowerA1",
        "Reading": 197.4,
        "ApparentVA": 197.4,
        "ReactiveVAR": 0,
        "PowerFactor": 1
    },
    "FrequencyHz": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/FrequencyA1",
        "Reading": 60
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/EnergyA1",
        "Reading": 36166
    },
    "Actions": {
        "#Outlet.PowerControl": {
```

```
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1/Outlet.PowerControl"
        },
        "#Outlet.ResetMetrics": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1/Outlet.ResetMetrics"
        }
    },
    "Links": {
        "BranchCircuit": {
            "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches/A"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
}
```


## 5.6 OutletGroup 1.2.0

| **Version** | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|
| **Release** | 2024.1 | 2021.4 | 2019.4 |

### 5.6.1 Description

The `OutletGroup` schema contains definitions for an electrical outlet group.

### 5.6.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/OutletGroups/*{OutletGroupId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/OutletGroups/*{OutletGroupId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/OutletGroups/*{OutletGroupId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/OutletGroups/*{OutletGroupId}*

### 5.6.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **ConfigurationLocked** *(v1.1+)* | boolean | *read-write* | Indicates whether the configuration is locked. |
| **CreatedBy** | string | *read-write (null)* | The creator of this outlet group. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **EnergykWh** { | object (excerpt) | | The energy (kWh) for this outlet group. This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri. |
| **ApparentkVAh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Apparent energy (kVAh). |
| **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. |
| **ReactivekVARh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Reactive energy (kVARh). |
| **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. |
| } | | | |
| **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. |
| **OutletGroups** *(v1.2+)* [ { | array | | The set of outlet groups in this outlet group. |
| **@odata.id** | string | *read-write* | Link to another OutletGroup resource. |
| } ] | | | |
| **OutletGroups@odata.count** | integer | *read-only* | The number of items in a collection. |
| **Outlets** [ { | array | | The set of outlets in this outlet group. |
| **@odata.id** | string | *read-write* | Link to a Outlet resource. See the Links section and the *Outlet* schema for details. |
| } ] | | | |
| **Outlets@odata.count** | integer | *read-only* | The number of items in a collection. |
| } | | | |
| **OutletGroupType** *(v1.2+)* | string (enum) | *read-only* | The type of outlet group that this resource represents. *For the possible property values, see OutletGroupType in Property details.* |
| **PowerControlLocked** *(v1.1+)* | boolean | *read-write* | Indicates whether power control requests are locked. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **PowerCycleDelaySeconds** | number | *read-write (null)* | The number of seconds to delay power on after a `PowerControl` action to cycle power. Zero seconds indicates no delay. |
| **PowerEnabled** | boolean | *read-only (null)* | Indicates if the outlet group can be powered. |
| **PowerOffDelaySeconds** | number | *read-write (null)* | The number of seconds to delay power off after a `PowerControl` action. Zero seconds indicates no delay to power off. |
| **PowerOnDelaySeconds** | number | *read-write (null)* | The number of seconds to delay power up after a power cycle or a `PowerControl` action. Zero seconds indicates no delay to power up. |
| **PowerRestoreDelaySeconds** | number | *read-write (null)* | The number of seconds to delay power on after power has been restored. Zero seconds indicates no delay. |
| **PowerRestorePolicy** | string (enum) | *read-write* | The desired power state of the outlet group when power is restored after a power loss. *For the possible property values, see PowerRestorePolicy in Property details.* |
| **PowerState** | string (enum) | *read-only (null)* | The power state of the outlet group. *For the possible property values, see PowerState in Property details.* |
| **PowerStateInTransition** *(v1.1+)* | boolean | *read-only* | Indicates whether the power state is undergoing a delayed transition. |
| **PowerWatts** { | object (excerpt) | | The power (W) for this outlet group. 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. |
| **PhaseAngleDegrees** *(v1.5+)* | number | *read-only (null)* | The phase angle (degrees) between the current and voltage waveforms. |
| **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 apparent VA and squared power (Reading) for a circuit, in VAR units. |
| **Reading** | number | *read-only (null)* | The sensor value. |
| } | | | |
| **Status** {} | object | | The status and health of the resource and its subordinate or dependent resources. See the *Resource* schema for details on this property. |

## 5.6.4 Actions

### 5.6.4.1 PowerControl

**Description**

This action turns the outlet group on or off.

**Action URI**

*{Base URI of target resource}*/Actions/OutletGroup.PowerControl

**Action parameters**

| Parameter Name | Type | Attributes | Notes |
|---|---|---|---|
| **PowerState** | string (enum) | *optional* | The desired power state of the outlet group. *For the possible property values, see PowerState in Property details.* |

**Request Example**

```
{
    "PowerState": "Off"
}
```

### 5.6.4.2 ResetMetrics

**Description**

This action resets metrics related to this outlet group.

**Action URI**

*{Base URI of target resource}*/Actions/OutletGroup.ResetMetrics

**Action parameters**

This action takes no parameters.

## 5.6.5 Property details

#### 5.6.5.1 OutletGroupType

The type of outlet group that this resource represents.

| string | Description |
|---|---|
| HardwareDefined | A group that is hardware-defined. |
| UserDefined | A group that is user-defined. |

#### 5.6.5.2 PowerRestorePolicy

The desired power state of the outlet group when power is restored after a power loss.

| string | Description |
|---|---|
| AlwaysOff | Always remain powered off when external power is applied. |
| AlwaysOn | Always power on when external power is applied. |
| LastState | Return to the last power state (on or off) when external power is applied. |

#### 5.6.5.3 PowerState

##### 5.6.5.3.1 In top level:

The power state of the outlet group.

| string | Description |
|---|---|
| Off | The resource is powered off. The components within the resource might continue to have AUX power. |
| On | The resource is powered on. |
| Paused | The resource is paused. |
| PoweringOff | A temporary state between on and off. The components within the resource can take time to process the power off action. |
| PoweringOn | A temporary state between off and on. The components within the resource can take time to process the power on action. |

##### 5.6.5.3.2 In Actions: PowerControl:

The desired power state of the outlet group.

| string | Description |
|---|---|
| Off | Power off. |
| On | Power on. |
| PowerCycle | Power cycle. |

## 5.6.6 Example response


```
{
    "@odata.type": "#OutletGroup.v1_2_0.OutletGroup",
    "Id": "Rack5Storage",
    "Name": "Outlet Group Rack5Storage",
    "Status": {
        "Health": "OK",
        "State": "Enabled"
    },
    "CreatedBy": "Bob",
    "PowerOnDelaySeconds": 4,
    "PowerOffDelaySeconds": 0,
    "PowerState": "On",
    "PowerEnabled": true,
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/GroupPowerA",
        "Reading": 412.36
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/GroupEnergyA",
        "Reading": 26880
    },
    "Links": {
        "Outlets": [
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A1"
            },
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A2"
            },
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets/A3"
            }
        ]
```

```
    },
    "Actions": {
        "#OutletGroup.PowerControl": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage/
         OutletGroup.PowerControl"
        },
        "#OutletGroup.ResetMetrics": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage/
         OutletGroup.ResetMetrics"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups/Rack5Storage"
}
```


## 5.7 PowerDistribution 1.4.0

| **Version** | *v1.4* | *v1.3* | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|---|---|
| **Release** | 2024.1 | 2022.3 | 2021.3 | 2021.2 | 2019.4 |

### 5.7.1 Description

The `PowerDistribution` schema contains the definitions for a power distribution component or unit, such as a floor power distribution unit (PDU) or switchgear.

### 5.7.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*

### 5.7.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **AssetTag** | string | *read-write (null)* | The user-assigned asset tag for this equipment. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Branches** { | object | | A link to the branch circuits for this equipment. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Circuit*. See the Circuit schema for details. |
| } | | | |
| **EquipmentType** | string (enum) | *read-only* *required* | The type of equipment this resource represents. *For the possible property values, see EquipmentType in Property details.* |
| **Feeders** { | object | | A link to the feeder circuits for this equipment. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Circuit*. See the Circuit schema for details. |
| } | | | |
| **FirmwareVersion** | string | *read-only* | The firmware version of this equipment. |
| **Links** { | object | | The links to other resources that are related to this resource. |
| **Chassis** [ { | array | | An array of links to the chassis that contain this equipment. |
| **@odata.id** | string | *read-only* | Link to a Chassis resource. See the Links section and the *Chassis* schema for details. |
| } ] | | | |
| **Chassis@odata.count** | integer | *read-only* | The number of items in a collection. |
| **Facility** { | object | | A link to the facility that contains this equipment. See the *Facility* schema for details on this property. |
| **@odata.id** | string | *read-only* | Link to a Facility resource. See the Links section and the *Facility* schema for details. |
| } | | | |
| **ManagedBy** [ { } ] | array (object) | | An array of links to the managers responsible for managing this equipment. See the *Manager* schema for details on this property. |
| **ManagedBy@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. |
| } | | | |
| **Location** {} | object | | The location of the equipment. See the *Resource* schema for details on this property. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Mains** { | object | | A link to the power input circuits for this equipment. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Circuit*. See the Circuit schema for details. |
| } | | | |
| **MainsRedundancy** *(v1.1+)* {} | object | | The redundancy information for the mains (input) circuits for this equipment. See the *Redundancy* schema for details on this property. |
| **Manufacturer** | string | *read-only (null)* | The manufacturer of this equipment. |
| **Metrics** { | object | | A link to the summary metrics for this equipment. See the *PowerDistributionMetrics* schema for details on this property. |
| **@odata.id** | string | *read-only* | Link to a PowerDistributionMetrics resource. See the Links section and the *PowerDistributionMetrics* schema for details. |
| } | | | |
| **Model** | string | *read-only (null)* | The product model number of this equipment. |
| **OutletGroups** { | object | | A link to the outlet groups for this equipment. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *OutletGroup*. See the OutletGroup schema for details. |
| } | | | |
| **Outlets** { | object | | A link to the outlets for this equipment. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Outlet*. See the Outlet schema for details. |
| } | | | |
| **PartNumber** | string | *read-only (null)* | The part number for this equipment. |
| **PowerCapacityVA** *(v1.4+)* | integer (V.A) | *read-only (null)* | The maximum power capacity, rated as apparent power, of this equipment, in volt-ampere units. |
| **PowerSupplies** *(v1.1+, deprecated v1.3)* { | object | | The link to the collection of power supplies for this equipment. Contains a link to a resource. *Deprecated in v1.3 and later. This property has been deprecated in favor of the* `PowerSupplies` *link in the* `Chassis` *resource.* |
| **@odata.id** | string | *read-only* | Link to Collection of *PowerSupply*. See the PowerSupply schema for details. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| } | | | |
| **PowerSupplyRedundancy** *(v1.1+, deprecated v1.3)* [ { } ] | array (object) | | The redundancy information for the set of power supplies for this equipment. See the *Redundancy* schema for details on this property. *Deprecated in v1.3 and later. This property has been deprecated in favor of the* `PowerSupplyRedundancy` *property in the* `Chassis` *resource.* |
| **ProductionDate** | string (date-time) | *read-only (null)* | The production or manufacturing date of this equipment. |
| **Sensors** *(deprecated v1.3)* { | object | | A link to the collection of sensors located in the equipment and sub-components. Contains a link to a resource. *Deprecated in v1.3 and later. This property has been deprecated in favor of the* `Sensors` *link in the* `Chassis` *resource.* |
| **@odata.id** | string | *read-only* | Link to Collection of *Sensor*. See the Sensor schema for details. |
| } | | | |
| **SerialNumber** | string | *read-only (null)* | The serial number for this equipment. |
| **Status** {} | object | | The status and health of the resource and its subordinate or dependent resources. See the *Resource* schema for details on this property. |
| **Subfeeds** { | object | | A link to the subfeed circuits for this equipment. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Circuit*. See the Circuit schema for details. |
| } | | | |
| **TransferConfiguration** { | object | *(null)* | The configuration settings for an automatic transfer switch. |
| **ActiveMainsId** | string | *read-write (null)* | The mains circuit that is switched on and qualified to supply power to the output circuit. |
| **AutoTransferEnabled** | boolean | *read-write (null)* | Indicates if the qualified alternate mains circuit is automatically switched on when the preferred mains circuit becomes unqualified and is automatically switched off. |
| **ClosedTransitionAllowed** | boolean | *read-write (null)* | Indicates if a make-before-break switching sequence of the mains circuits is permitted when they are both qualified and in synchronization. |
| **ClosedTransitionTimeoutSeconds** | integer | *read-write (null)* | The time in seconds to wait for a closed transition to occur. |
| **PreferredMainsId** | string | *read-write (null)* | The preferred source for the mains circuit to this equipment. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **RetransferDelaySeconds** | integer | *read-write (null)* | The time in seconds to delay the automatic transfer from the alternate mains circuit back to the preferred mains circuit. |
| **RetransferEnabled** | boolean | *read-write (null)* | Indicates if the automatic transfer is permitted from the alternate mains circuit back to the preferred mains circuit after the preferred mains circuit is qualified again and the retransfer delay time has expired. |
| **TransferDelaySeconds** | integer | *read-write (null)* | The time in seconds to delay the automatic transfer from the preferred mains circuit to the alternate mains circuit when the preferred mains circuit is disqualified. |
| **TransferInhibit** | boolean | *read-write (null)* | Indicates if any transfer is inhibited. |
| } | | | |
| **TransferCriteria** { | object | *(null)* | The criteria used to initiate a transfer for an automatic transfer switch. |
| **OverNominalFrequencyHz** | number (Hz) | *read-write (null)* | The frequency in hertz units over the nominal value that satisfies a criterion for transfer. |
| **OverVoltageRMSPercentage** | number (%) | *read-write (null)* | The positive percentage of voltage RMS over the nominal value that satisfies a criterion for transfer. |
| **TransferSensitivity** | string (enum) | *read-write (null)* | The sensitivity to voltage waveform quality to satisfy the criterion for initiating a transfer. *For the possible property values, see TransferSensitivity in Property details.* |
| **UnderNominalFrequencyHz** | number (Hz) | *read-write (null)* | The frequency in hertz units under the nominal value that satisfies a criterion for transfer. |
| **UnderVoltageRMSPercentage** | number (%) | *read-write (null)* | The negative percentage of voltage RMS under the nominal value that satisfies a criterion for transfer. |
| } | | | |
| **UserLabel** *(v1.3+)* | string | *read-write* | A user-assigned label. |
| **UUID** | string (uuid) | *read-only (null)* | The UUID for this equipment. |
| **Version** | string | *read-only (null)* | The hardware version of this equipment. |

## 5.7.4 Actions

### 5.7.4.1 TransferControl

**Description**

This action transfers control to the alternative input circuit.

**Action URI**

*{Base URI of target resource}*/Actions/PowerDistribution.TransferControl

**Action parameters**

This action takes no parameters.

## 5.7.5 Property details

### 5.7.5.1 EquipmentType

The type of equipment this resource represents.

| string | Description |
|---|---|
| AutomaticTransferSwitch | An automatic power transfer switch. |
| BatteryShelf *(v1.3+)* | A battery shelf or battery-backed unit (BBU). |
| Bus *(v1.2+)* | An electrical bus. |
| FloorPDU | A power distribution unit providing feeder circuits for further power distribution. |
| ManualTransferSwitch | A manual power transfer switch. |
| PowerShelf *(v1.1+)* | A power shelf. |
| RackPDU | A power distribution unit providing outlets for a rack or similar quantity of devices. |
| Switchgear | Electrical switchgear. |

### 5.7.5.2 TransferSensitivity

The sensitivity to voltage waveform quality to satisfy the criterion for initiating a transfer.

| string | Description |
|---|---|
| High | High sensitivity for initiating a transfer. |
| Low | Low sensitivity for initiating a transfer. |
| Medium | Medium sensitivity for initiating a transfer. |

### 5.7.6 Example response


```
{
    "@odata.type": "#PowerDistribution.v1_4_0.PowerDistribution",
    "Id": "1",
    "EquipmentType": "RackPDU",
    "Name": "RackPDU1",
    "FirmwareVersion": "4.3.0",
    "Version": "1.03b",
    "ProductionDate": "2017-01-11T08:00:00Z",
    "Manufacturer": "Contoso",
    "Model": "ZAP4000",
    "SerialNumber": "29347ZT536",
    "PartNumber": "AA-23",
    "UUID": "32354641-4135-4332-4a35-313735303734",
    "AssetTag": "PDX-92381",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Location": {
        "Placement": {
            "Row": "North 1"
        }
    },
    "Mains": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Mains"
    },
    "Branches": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Branches"
    },
    "Outlets": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Outlets"
    },
    "OutletGroups": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/OutletGroups"
    },
    "Metrics": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics"
    },
    "Sensors": {
```

```
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors"
    },
    "Links": {
        "Facility": {
            "@odata.id": "/redfish/v1/Facilities/Room237"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
}
```


## 5.8 PowerDistributionMetrics 1.4.0

| **Version** | *v1.4* | *v1.3* | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|---|---|
| **Release** | 2025.1 | 2021.4 | 2021.2 | 2021.1 | 2019.4 |

### 5.8.1 Description

The `PowerDistributionMetrics` schema contains metrics of a power distribution component or unit, such as a floor power distribution unit (PDU) or switchgear.

### 5.8.2 URIs

/redfish/v1/PowerEquipment/ElectricalBuses/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Metrics
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Metrics

### 5.8.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **AbsoluteHumidity** *(v1.3+)* {} | object | | Absolute humidity (g/m^3). For more information about this property, see SensorExcerpt in Property Details. |
| **AmbientTemperatureCelsius** *(v1.4+)* {} | object | | Ambient temperature (Celsius). For more information about this property, see SensorExcerpt in Property Details. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **EnergykWh** { | object (excerpt) | | Energy consumption (kWh). This object is an excerpt of the *Sensor* resource located at the URI shown in DataSourceUri. |
| **ApparentkVAh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Apparent energy (kVAh). |
| **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. |
| **ReactivekVARh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Reactive energy (kVARh). |
| **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. |
| } | | | |
| **HumidityPercent** *(v1.1+)* {} | object | | Humidity (percent). For more information about this property, see SensorExcerpt in Property Details. |
| **PowerLoadPercent** *(v1.2+)* {} | object | | The power load (percent) for this equipment. For more information about this property, see SensorExcerpt in Property Details. |
| **PowerWatts** { | object (excerpt) | | Power consumption (W). 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. |
| **PhaseAngleDegrees** *(v1.5+)* | number | *read-only (null)* | The phase angle (degrees) between the current and voltage waveforms. |
| **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 apparent VA and squared power (Reading) for a circuit, in VAR units. |
| **Reading** | number | *read-only (null)* | The sensor value. |
| } | | | |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **TemperatureCelsius** *(v1.1+)* {} | object | | Temperature (Celsius). For more information about this property, see SensorExcerpt in Property Details. |

## 5.8.4 Actions

### 5.8.4.1 ResetMetrics

**Description**

This action resets the summary metrics related to this equipment.

**Action URI**

*{Base URI of target resource}*/Actions/PowerDistributionMetrics.ResetMetrics

**Action parameters**

This action takes no parameters.

## 5.8.5 Property details

### 5.8.5.1 SensorExcerpt

The `Sensor` schema describes a sensor and its properties. 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. |

## 5.8.6 Example response


```
{
    "@odata.type": "#PowerDistributionMetrics.v1_3_2.PowerDistributionMetrics",
    "Id": "Metrics",
```

```
    "Name": "Summary Metrics",
    "PowerWatts": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PDUPower",
        "Reading": 6438,
        "ApparentVA": 6300,
        "ReactiveVAR": 100,
        "PowerFactor": 0.93
    },
    "EnergykWh": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PDUEnergy",
        "Reading": 56438
    },
    "TemperatureCelsius": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PDUTemp",
        "Reading": 26.3
    },
    "HumidityPercent": {
        "DataSourceUri": "/redfish/v1/PowerEquipment/RackPDUs/1/Sensors/PDUHumidity",
        "Reading": 52.7
    },
    "Actions": {
        "#PowerDistributionMetrics.ResetMetrics": {
            "target": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics/
         PowerDistributionMetrics.ResetMetrics"
        }
    },
    "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1/Metrics"
}
```


## 5.9 PowerDomain 1.2.2

| **Version** | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|
| **Release** | 2021.3 | 2021.2 | 2019.4 |

### 5.9.1 Description

The `PowerDomain` schema contains the definition for the DCIM power domain.

### 5.9.2 URIs

/redfish/v1/Facilities/*{FacilityId}*/PowerDomains/*{PowerDomainId}*

### 5.9.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Links** { | object | | The links to other resources that are related to this resource. |
| **ElectricalBuses** *(v1.2+)* [ { | array | | An array of links to the electrical buses in this power domain. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **ElectricalBuses@odata.count** | integer | *read-only* | The number of items in a collection. |
| **FloorPDUs** [ { | array | | An array of links to the floor power distribution units in this power domain. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **FloorPDUs@odata.count** | integer | *read-only* | The number of items in a collection. |
| **ManagedBy** [ { } ] | array (object) | | An array of links to the managers responsible for managing this power domain. See the *Manager* schema for details on this property. |
| **ManagedBy@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. |
| **PowerShelves** *(v1.1+)* [ { | array | | An array of links to the power shelves in this power domain. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **PowerShelves@odata.count** | integer | *read-only* | The number of items in a collection. |
| **RackPDUs** [ { | array | | An array of links to the rack-level power distribution units in this power domain. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **RackPDUs@odata.count** | integer | *read-only* | The number of items in a collection. |
| **Switchgear** [ { | array | | An array of links to the switchgear in this power domain. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **Switchgear@odata.count** | integer | *read-only* | The number of items in a collection. |
| **TransferSwitches** [ { | array | | An array of links to the transfer switches in this power domain. |
| **@odata.id** | string | *read-write* | Link to a PowerDistribution resource. See the Links section and the *PowerDistribution* schema for details. |
| } ] | | | |
| **TransferSwitches@odata.count** | integer | *read-only* | The number of items in a collection. |
| } | | | |
| **Status** {} | object | | The status and health of the resource and its subordinate or dependent resources. See the *Resource* schema for details on this property. |

### 5.9.4 Example response

```
{
    "@odata.type": "#PowerDomain.v1_2_2.PowerDomain",
    "Id": "Row1",
    "Name": "Row #1 Domain",
    "Status": {
        "State": "Enabled",
        "Health": "OK"
    },
    "Links": {
        "ManagedBy": [
            {
                "@odata.id": "/redfish/v1/Managers/BMC"
            }
        ],
        "RackPDUs": [
            {
                "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs/1"
            }
        ]
    },
    "@odata.id": "/redfish/v1/Facilities/Room237/PowerDomains/Row1"
}
```

## 5.10 PowerEquipment 1.2.3

| Version | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|
| **Release** | 2021.3 | 2021.2 | 2019.4 |

### 5.10.1 Description

The `PowerEquipment` schema represents the set of power equipment managed by a Redfish service.

### 5.10.2 URIs

/redfish/v1/PowerEquipment

### 5.10.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **ElectricalBuses** *(v1.2+)* { | object | | The link to a collection of electrical buses. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details. |
| } | | | |
| **FloorPDUs** { | object | | A link to a collection of floor power distribution units. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details. |
| } | | | |
| **Links** { | object | | The links to other resources that are related to this resource. |
| **ManagedBy** [ { } ] | array (object) | | An array of links to the managers responsible for managing this power equipment. See the *Manager* schema for details on this property. |
| **ManagedBy@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. |
| } | | | |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **PowerShelves** *(v1.1+)* { | object | | A link to a collection of power shelves. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details. |
| } | | | |
| **RackPDUs** { | object | | A link to a collection of rack-level power distribution units. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details. |
| } | | | |
| **Status** {} | object | | The status and health of the resource and its subordinate or dependent resources. See the *Resource* schema for details on this property. |
| **Switchgear** { | object | | A link to a collection of switchgear. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details. |
| } | | | |
| **TransferSwitches** { | object | | A link to a collection of transfer switches. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *PowerDistribution*. See the PowerDistribution schema for details. |
| } | | | |

### 5.10.4 Example response


```
{
    "@odata.type": "#PowerEquipment.v1_2_2.PowerEquipment",
    "Id": "PowerEquipment",
    "Name": "DCIM Power Equipment",
    "Status": {
        "State": "Enabled",
        "HealthRollup": "OK"
    },
    "FloorPDUs": {
        "@odata.id": "/redfish/v1/PowerEquipment/FloorPDUs"
    },
    "RackPDUs": {
        "@odata.id": "/redfish/v1/PowerEquipment/RackPDUs"
    },
```

```
    "TransferSwitches": {
        "@odata.id": "/redfish/v1/PowerEquipment/TransferSwitches"
    },
    "@odata.id": "/redfish/v1/PowerEquipment"
}
```

## 5.11 Sensor 1.10.1

| **Version** | *v1.10* | *v1.9* | *v1.8* | *v1.7* | *v1.6* | *v1.5* | *v1.4* | *v1.3* | *v1.2* | *v1.1* | *v1.0* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Release** | 2024.2 | 2024.1 | 2023.2 | 2023.1 | 2022.2 | 2021.4 | 2021.2 | 2021.1 | 2020.4 | 2019.4 | 2018.3 |

### 5.11.1 Description

The `Sensor` schema describes a sensor and its properties.

### 5.11.2 URIs

/redfish/v1/Chassis/*{ChassisId}*/Sensors/*{SensorId}*
/redfish/v1/PowerEquipment/FloorPDUs/*{PowerDistributionId}*/Sensors/*{SensorId}* (deprecated)
/redfish/v1/PowerEquipment/PowerShelves/*{PowerDistributionId}*/Sensors/*{SensorId}* (deprecated)
/redfish/v1/PowerEquipment/RackPDUs/*{PowerDistributionId}*/Sensors/*{SensorId}* (deprecated)
/redfish/v1/PowerEquipment/Switchgear/*{PowerDistributionId}*/Sensors/*{SensorId}* (deprecated)
/redfish/v1/PowerEquipment/TransferSwitches/*{PowerDistributionId}*/Sensors/*{SensorId}* (deprecated)

### 5.11.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Accuracy** *(deprecated v1.8)* | number (%) | *read-only (null)* | The estimated percent error of measured versus actual values. *Deprecated in v1.8 and later. This property has been deprecated in favor of ReadingAccuracy.* |
| **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. |
| **ApparentkVAh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Apparent energy (kVAh). |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **ApparentVA** | number (V.A) | *read-only (null)* | The product of voltage and current for an AC circuit, in volt-ampere units. |
| **AverageReading** *(v1.4+)* | number | *read-only (null)* | The average sensor value. |
| **AveragingInterval** *(v1.4+)* | string (duration) | *read-write (null)* | The interval over which the average sensor value is calculated. |
| **AveragingIntervalAchieved** *(v1.4+)* | boolean | *read-only (null)* | Indicates that enough readings were collected to calculate the average sensor reading over the averaging interval time. |
| **Calibration** *(v1.4+)* | number | *read-write (null)* | The calibration offset applied to the Reading. |
| **CalibrationTime** *(v1.4+)* | string (date-time) | *read-write (null)* | The date and time that the sensor was last calibrated. |
| **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.* |
| **Enabled** *(v1.10+)* | boolean | *read-write (null)* | Indicates whether the sensor is enabled and provides a reading. |
| **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. |
| **LifetimeStartDateTime** *(v1.9+)* | string (date-time) | *read-only (null)* | The date and time when the sensor started accumulating readings for the `LifetimeReading` property. |
| **Links** *(v1.3+)* { | object | | The links to other resources that are related to this resource. |
| **AssociatedControls** *(v1.4+)* [ { } ] | array (object) | | An array of links to the controls that can affect this sensor. See the *Control* schema for details on this property. |
| **AssociatedControls@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. |
| } | | | |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **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. |
| **LowestReading** *(v1.4+)* | number | *read-only (null)* | The lowest sensor value. |
| **LowestReadingTime** *(v1.4+)* | string (date-time) | *read-only (null)* | The time when the lowest sensor value occurred. |
| **Manufacturer** *(v1.9+)* | string | *read-only (null)* | The manufacturer of this sensor. |
| **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. |
| **Model** *(v1.9+)* | string | *read-only (null)* | The model number of the sensor. |
| **PartNumber** *(v1.9+)* | string | *read-only (null)* | The part number of the sensor. |
| **PeakReading** | number | *read-only (null)* | The peak sensor value. |
| **PeakReadingTime** | string (date-time) | *read-only (null)* | The time when the peak sensor value occurred. |
| **PhaseAngleDegrees** *(v1.5+)* | number | *read-only (null)* | The phase angle (degrees) between the current and voltage waveforms. |
| **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. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **ReactivekVARh** *(v1.5+)* | number (kV.A.h) | *read-only (null)* | Reactive energy (kVARh). |
| **ReactiveVAR** | number (V.A) | *read-only (null)* | The square root of the difference term of squared apparent VA and squared power (Reading) for a circuit, in VAR units. |
| **Reading** | number | *read-only (null)* | The sensor value. |
| **ReadingAccuracy** *(v1.8+)* | number | *read-only (null)* | Accuracy (+/-) of the reading. |
| **ReadingBasis** *(v1.7+)* | string (enum) | *read-only (null)* | The basis for the reading of this sensor. *For the possible property values, see ReadingBasis in Property details.* |
| **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, thresholds, and other reading-related properties in UCUM c/s format. |
| **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 (duration) | *read-only (null)* | The time interval between readings of the sensor. |
| **SensorGroup** *(v1.4+)* {} | object | | The group of sensors that provide readings for this sensor. See the *Redundancy* schema for details on this property. |
| **SensorResetTime** | string (date-time) | *read-only (null)* | The date and time when the time-based properties were last reset. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **SerialNumber** *(v1.9+)* | string | *read-only (null)* | The serial number of the sensor. |
| **SKU** *(v1.9+)* | string | *read-only (null)* | The SKU of the sensor. |
| **SparePartNumber** *(v1.9+)* | string | *read-only (null)* | The spare part number of the sensor. |
| **SpeedRPM** *(v1.2+)* | number ({rev}/min) | *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 percent (% THD). |
| **Thresholds** { | object | | The set of thresholds defined for this sensor. |
| **LowerCaution** {} | object | | The value at which the reading is below normal range. For more information about this property, see Threshold in Property Details. |
| **LowerCautionUser** *(v1.2+)* {} | object | | A user-defined value at which the reading is considered below normal range. For more information about this property, see Threshold in Property Details. |
| **LowerCritical** {} | object | | The value at which the reading is below normal range but not yet fatal. For more information about this property, see Threshold in Property Details. |
| **LowerCriticalUser** *(v1.2+)* {} | object | | A user-defined value at which the reading is considered below normal range but not yet fatal. For more information about this property, see Threshold in Property Details. |
| **LowerFatal** {} | object | | The value at which the reading is below normal range and fatal. For more information about this property, see Threshold in Property Details. |
| **UpperCaution** {} | object | | The value at which the reading is above normal range. For more information about this property, see Threshold in Property Details. |
| **UpperCautionUser** *(v1.2+)* {} | object | | A user-defined value at which the reading is considered above normal range. For more information about this property, see Threshold in Property Details. |
| **UpperCritical** {} | object | | The value at which the reading is above normal range but not yet fatal. For more information about this property, see Threshold in Property Details. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **UpperCriticalUser** *(v1.2+)* {} | object | | A user-defined value at which the reading is considered above normal range but not yet fatal. For more information about this property, see Threshold in Property Details. |
| **UpperFatal** {} | object | | The value at which the reading is above normal range and fatal. For more information about this property, see Threshold in Property Details. |
| } | | | |
| **UserLabel** *(v1.9+)* | string | *read-write* | A user-assigned label. |
| **VoltageType** | string (enum) | *read-only (null)* | The voltage type for this sensor. *For the possible property values, see VoltageType in Property details.* |

## 5.11.4 Actions

### 5.11.4.1 ResetMetrics

**Description**

Resets metrics related to this sensor.

**Action URI**

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

**Action parameters**

This action takes no parameters.

### 5.11.4.2 ResetToDefaults *(v1.6+)*

**Description**

The action resets the values of writable properties to factory defaults.

**Action URI**

*{Base URI of target resource}*/Actions/Sensor.ResetToDefaults

**Action parameters**

This action takes no parameters.

## 5.11.5 Property details

### 5.11.5.1 Activation

The direction of crossing that activates this threshold.

| string | Description |
|---|---|
| Decreasing | Value decreases below the threshold. |
| Disabled *(v1.7+)* | The threshold is disabled. |
| Either | Value crosses the threshold in either direction. |
| Increasing | Value increases above the threshold. |

### 5.11.5.2 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 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. |

| string | Description |
|---|---|
| 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. |

#### 5.11.5.3 Implementation

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 or multiple sensors. The calculation is not provided. |

#### 5.11.5.4 PhysicalContext

The area or device to which this sensor measurement applies.

| string | Description |
|---|---|
| Accelerator | An accelerator. |
| ACInput | An AC electrical input or input-related circuit. |
| ACMaintenanceBypassInput | An AC electrical maintenance bypass input. |
| ACOutput | An AC electrical output or output-related circuit. |
| ACStaticBypassInput | An AC electrical static bypass input. |
| ACUtilityInput | An AC electrical 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. |

| string | Description |
| --- | --- |
| Battery | A battery. |
| Board | A circuit board. |
| Chassis | The entire chassis. |
| ComputeBay | 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 electrical bus. |
| Exhaust | The air exhaust point or points or region of the chassis. |
| ExpansionBay | An expansion bay. |
| ExpansionSubsystem | A group of expansion bays. |
| Fan | A fan. |
| Filter | A filter. |
| 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. |
| Manager | A management controller, such as a BMC (baseboard management controller). |
| Memory | A memory device. |
| MemorySubsystem | The entire memory subsystem. |
| Motor | A motor. |
| NetworkBay | A networking bay. |

| string | Description |
|---|---|
| NetworkingDevice | A networking device. |
| PowerOutlet | An electrical outlet. |
| PowerSubsystem | The entire power subsystem. |
| PowerSupply | A power supply. |
| PowerSupplyBay | A power supply bay. |
| Pump | A pump. |
| Rectifier | A rectifier device. |
| Reservoir | A reservoir. |
| Room | The room. |
| StorageBay | A storage bay. |
| StorageDevice | A storage device. |
| StorageSubsystem | A storage subsystem. |
| Switch | A switch device. |
| SystemBoard | The system board (PCB). |
| Transceiver | A transceiver. |
| Transformer | A transformer. |
| TrustedModule | A trusted module. |
| Upper | The upper portion of the chassis. |
| VoltageRegulator | A voltage regulator device. |

#### 5.11.5.5 PhysicalSubContext

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

| string | Description |
|---|---|
| Input | The input. |
| Output | The output. |

#### 5.11.5.6 ReadingBasis

The basis for the reading of this sensor.

| string | Description |
|---|---|
| Delta | A reading that reports the difference between two measurements. |
| Headroom | A reading that decreases as it approaches a defined reference point. |
| Zero | A zero-based reading. |

#### 5.11.5.7 ReadingType

The type of sensor.

| string | Description |
|---|---|
| AbsoluteHumidity *(v1.5+)* | Absolute humidity (g/m^3). |
| AirFlow *(deprecated v1.7)* | Air flow (cu ft/min). *Deprecated in v1.7 and later. This value has been deprecated in favor of* `AirFlowCMM` *for consistent use of SI units.* |
| AirFlowCMM *(v1.7+)* | Air flow (m^3/min). |
| Altitude | Altitude (m). |
| Barometric | Barometric pressure (mm). |
| ChargeAh *(v1.4+)* | Charge (Ah). |
| Current | Current (A). |
| EnergyJoules | Energy (J). |
| EnergykWh | Energy (kWh). |
| EnergyWh *(v1.4+)* | Energy (Wh). |
| Frequency | Frequency (Hz). |
| Heat *(v1.7+)* | Heat (kW). |
| Humidity | Relative humidity (percent). |
| LiquidFlow *(deprecated v1.7)* | Liquid flow (L/s). *Deprecated in v1.7 and later. This value has been deprecated in favor of* `LiquidFlowLPM` *for consistency of units typically expected or reported by* `Sensor` *and* `Control` *resources.* |

| string | Description |
|---|---|
| LiquidFlowLPM *(v1.7+)* | Liquid flow (L/min). |
| LiquidLevel | Liquid level (cm). |
| Percent *(v1.1+)* | Percent (%). |
| Power | Power (W). |
| Pressure *(deprecated v1.7)* | Pressure (Pa). *Deprecated in v1.7 and later. This value has been deprecated in favor of* `PressurePa` *or* `PressurekPa` *for consistency of units between* `Sensor` *and* `Control` *resources.* |
| PressurekPa *(v1.5+)* | Pressure (kPa). |
| PressurePa *(v1.7+)* | Pressure (Pa). |
| Rotational | Rotational (RPM). |
| Temperature | Temperature (C). |
| Voltage | Voltage (VAC or VDC). |

#### 5.11.5.8 Threshold

The threshold definition for a sensor.

| | | | |
|---|---|---|---|
| **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 (duration) | *read-write (null)* | The duration the sensor value must violate the threshold before the threshold is activated. |
| **HysteresisDuration** *(v1.7+)* | string (duration) | *read-write (null)* | The duration the sensor value must not violate the threshold before the threshold is deactivated. |
| **HysteresisReading** *(v1.7+)* | number | *read-write (null)* | The reading offset from the threshold value required to clear the threshold. |
| **Reading** | number | *read-write (null)* | The threshold value. |

#### 5.11.5.9 VoltageType

The voltage type for this sensor.

| string | Description |
|---|---|
| AC | Alternating current. |
| DC | Direct current. |

## 5.11.6 Example response

```
{
    "@odata.type": "#Sensor.v1_10_1.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"
        }
    },
    "@odata.id": "/redfish/v1/Chassis/1/Sensors/CabinetTemp"
}
```

## 5.12 ServiceRoot 1.18.0

| **Version** | *v1.18* | *v1.17* | *v1.16* | *v1.15* | *v1.14* | *v1.13* | *v1.12* | *v1.11* | *v1.10* | *v1.9* | *v1.8* | ... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Release** | 2025.1 | 2024.1 | 2023.1 | 2022.3 | 2022.1 | 2021.4 | 2021.3 | 2021.2 | 2021.1 | 2020.3 | 2020.2 | ... |

### 5.12.1 Description

The `ServiceRoot` schema describes the root of the Redfish service, located at the '/redfish/v1' URI. All other resources accessible through the Redfish interface on this device are linked directly or indirectly from the service root.

### 5.12.2 URIs

/redfish/v1
/redfish/v1/

### 5.12.3 Properties

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **AccountService** {} | object | | The link to the account service. See the *AccountService* schema for details on this property. |
| **AggregationService** *(v1.8+)* {} | object | | The link to the aggregation service. See the *AggregationService* schema for details on this property. |
| **Cables** *(v1.11+)* { | object | | The link to a collection of cables. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Cable*. See the Cable schema for details. |
| } | | | |
| **CertificateService** *(v1.5+)* {} | object | | The link to the certificate service. See the *CertificateService* schema for details on this property. |
| **Chassis** { | object | | The link to a collection of chassis. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Chassis*. See the Chassis schema for details. |
| } | | | |
| **ComponentIntegrity** *(v1.13+)* { | object | | The link to a collection of component integrity information. Contains a link to a resource. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **@odata.id** | string | *read-only* | Link to Collection of *ComponentIntegrity*. See the ComponentIntegrity schema for details. |
| } | | | |
| **CompositionService** *(v1.2+)* {} | object | | The link to the composition service. See the *CompositionService* schema for details on this property. |
| **EventService** {} | object | | The link to the event service. See the *EventService* schema for details on this property. |
| **Fabrics** *(v1.1+)* { | object | | The link to a collection of fabrics. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Fabric*. See the Fabric schema for details. |
| } | | | |
| **Facilities** *(v1.6+)* { | object | | The link to a collection of facilities. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Facility*. See the Facility schema for details. |
| } | | | |
| **JobService** *(v1.4+)* {} | object | | The link to the job service. See the *JobService* schema for details on this property. |
| **JsonSchemas** { | object | | The link to a collection of JSON Schema files. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *JsonSchemaFile*. See the JsonSchemaFile schema for details. |
| } | | | |
| **KeyService** *(v1.11+)* {} | object | | The link to the key service. See the *KeyService* schema for details on this property. |
| **LicenseService** *(v1.12+)* {} | object | | The link to the license service. See the *LicenseService* schema for details on this property. |
| **Links** { | object | *required* | The links to other resources that are related to this resource. |
| **ManagerProvidingService** *(v1.15+)* {} | object | | The link to the manager that is providing this Redfish service. See the *Manager* schema for details on this property. |
| **Oem** {} | object | | The OEM extension property. See the *Resource* schema for details on this property. |
| **Sessions** { | object | *required* | The link to a collection of sessions. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Session*. See the Session schema for details. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| } | | | |
| } | | | |
| **Managers** { | object | | The link to a collection of managers. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Manager*. See the Manager schema for details. |
| } | | | |
| **NVMeDomains** *(v1.10+)* {} | object | | The link to a collection of NVMe domains. |
| **PowerEquipment** *(v1.6+)* { | object | | The link to a set of power equipment. See the *PowerEquipment* schema for details on this property. |
| **@odata.id** | string | *read-only* | Link to a PowerEquipment resource. See the Links section and the *PowerEquipment* schema for details. |
| } | | | |
| **Product** *(v1.3+)* | string | *read-only* *(null)* | The product associated with this Redfish service. |
| **ProtocolFeaturesSupported** *(v1.3+)* { | object | | The information about protocol features that the service supports. |
| **DeepOperations** *(v1.7+)* { | object | | The information about deep operations that the service supports. |
| **DeepPATCH** *(v1.7+)* | boolean | *read-only* | An indication of whether the service supports the deep `PATCH` operation. |
| **DeepPOST** *(v1.7+)* | boolean | *read-only* | An indication of whether the service supports the deep `POST` operation. |
| **MaxLevels** *(v1.7+)* | integer | *read-only* | The maximum levels of resources allowed in deep operations. |
| } | | | |
| **ExcerptQuery** *(v1.4+)* | boolean | *read-only* | An indication of whether the service supports the `excerpt` query parameter. |
| **ExpandQuery** *(v1.3+)* { | object | | The information about the use of `$expand` in the service. |
| **ExpandAll** *(v1.3+)* | boolean | *read-only* | An indication of whether the service supports the asterisk ( `*` ) option of the `$expand` query parameter. |
| **Levels** *(v1.3+)* | boolean | *read-only* | An indication of whether the service supports the `$levels` option of the `$expand` query parameter. |
| **Links** *(v1.3+)* | boolean | *read-only* | An indication of whether this service supports the tilde ( `~` ) option of the `$expand` query parameter. |
| **MaxLevels** *(v1.3+)* | integer | *read-only* | The maximum `$levels` option value in the `$expand` query parameter. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **NoLinks** *(v1.3+)* | boolean | *read-only* | An indication of whether the service supports the period ( `.` ) option of the `$expand` query parameter. |
| } | | | |
| **FilterQuery** *(v1.3+)* | boolean | *read-only* | An indication of whether the service supports the `$filter` query parameter. |
| **FilterQueryComparisonOperations** *(v1.17+)* | boolean | *read-only* | An indication of whether the service supports the `eq` , `ge` , `gt` , `le` , `lt` , and `ne` options for the `$filter` query parameter. |
| **FilterQueryCompoundOperations** *(v1.17+)* | boolean | *read-only* | An indication of whether the service supports the `()` , `and` , `not` , and `or` options for the `$filter` query parameter. |
| **IncludeOriginOfConditionQuery** *(v1.18+)* | boolean | *read-only* | An indication of whether the service supports the `includeoriginofcondition` query parameter. |
| **MultipleHTTPRequests** *(v1.14+)* | boolean | *read-only* | An indication of whether the service supports multiple outstanding HTTP requests. |
| **OnlyMemberQuery** *(v1.4+)* | boolean | *read-only* | An indication of whether the service supports the `only` query parameter. |
| **SelectQuery** *(v1.3+)* | boolean | *read-only* | An indication of whether the service supports the `$select` query parameter. |
| **TopSkipQuery** *(v1.17+)* | boolean | *read-only* | An indication of whether the service supports both the `$top` and `$skip` query parameters. |
| } | | | |
| **RedfishVersion** | string | *read-only* | The version of the Redfish service. |
| **RegisteredClients** *(v1.13+)* { | object | | The link to a collection of registered clients. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *RegisteredClient*. See the RegisteredClient schema for details. |
| } | | | |
| **Registries** { | object | | The link to a collection of registries. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *MessageRegistryFile*. See the MessageRegistryFile schema for details. |
| } | | | |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **ResourceBlocks** *(v1.5+)* { | object | | The link to a collection of resource blocks. This collection is intended for implementations that do not contain a composition service but that expose resources to an orchestrator that implements a composition service. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *ResourceBlock*. See the ResourceBlock schema for details. |
| } | | | |
| **ServiceConditions** *(v1.13+)* {} | object | | The link to the service conditions. See the *ServiceConditions* schema for details on this property. |
| **ServiceIdentification** *(v1.14+)* | string | *read-only* | The vendor or user-provided product and service identifier. |
| **SessionService** {} | object | | The link to the sessions service. See the *SessionService* schema for details on this property. |
| **Storage** *(v1.9+)* { | object | | The link to a collection of storage subsystems. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *Storage*. See the Storage schema for details. |
| } | | | |
| **StorageServices** *(v1.1+)* {} | object | | The link to a collection of storage services. |
| **StorageSystems** *(v1.1+)* {} | object | | The link to a collection of storage systems. |
| **Systems** { | object | | The link to a collection of systems. Contains a link to a resource. |
| **@odata.id** | string | *read-only* | Link to Collection of *ComputerSystem*. See the ComputerSystem schema for details. |
| } | | | |
| **Tasks** {} | object | | The link to the task service. See the *TaskService* schema for details on this property. |
| **TelemetryService** *(v1.4+)* {} | object | | The link to the telemetry service. See the *TelemetryService* schema for details on this property. |
| **ThermalEquipment** *(v1.16+)* {} | object | | The link to a set of cooling equipment. See the *ThermalEquipment* schema for details on this property. |
| **UpdateService** *(v1.1+)* {} | object | | The link to the update service. See the *UpdateService* schema for details on this property. |
| **UUID** | string (uuid) | *read-only (null)* | Unique identifier for a service instance. When SSDP is used, this value contains the same UUID returned in an HTTP `200 OK` response from an SSDP `M-SEARCH` request during discovery. |

| Property | Type | Attributes | Notes |
|---|---|---|---|
| **Vendor** *(v1.5+)* | string | *read-only* *(null)* | The vendor or manufacturer associated with this Redfish service. |

## 5.12.4 Property details

### 5.12.4.1 idRef

| | | | |
|---|---|---|---|
| **@odata.id** | string (URI) | *read-only* | The unique identifier for a resource. |

## 5.12.5 Example response


```
{
    "@odata.type": "#ServiceRoot.v1_17_0.ServiceRoot",
    "Id": "RootService",
    "Name": "Root Service",
    "RedfishVersion": "1.15.0",
    "UUID": "92384634-2938-2342-8820-489239905423",
    "Product": "UR99 1U Server",
    "ProtocolFeaturesSupported": {
        "ExpandQuery": {
            "ExpandAll": true,
            "Levels": true,
            "MaxLevels": 6,
            "Links": true,
            "NoLinks": true
        },
        "SelectQuery": false,
        "FilterQuery": false,
        "OnlyMemberQuery": true,
        "ExcerptQuery": true,
        "MultipleHTTPRequests": true
    },
    "ServiceConditions": {
        "@odata.id": "/redfish/v1/ServiceConditions"
    },
    "Systems": {
        "@odata.id": "/redfish/v1/Systems"
    },
    "Chassis": {
        "@odata.id": "/redfish/v1/Chassis"
    },
    "Managers": {
```

```
        "@odata.id": "/redfish/v1/Managers"
    },
    "UpdateService": {
        "@odata.id": "/redfish/v1/UpdateService"
    },
    "CompositionService": {
        "@odata.id": "/redfish/v1/CompositionService"
    },
    "Tasks": {
        "@odata.id": "/redfish/v1/TaskService"
    },
    "SessionService": {
        "@odata.id": "/redfish/v1/SessionService"
    },
    "AccountService": {
        "@odata.id": "/redfish/v1/AccountService"
    },
    "EventService": {
        "@odata.id": "/redfish/v1/EventService"
    },
    "Links": {
        "Sessions": {
            "@odata.id": "/redfish/v1/SessionService/Sessions"
        }
    },
    "@odata.id": "/redfish/v1/"
}
```

# 6 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.

# 7 Change log

| Version | Date | Description |
|---|---|---|
| 1.1 | 2025-02-14 | Updated content to DSP8010 2025.1 release bundle. |
| | | Added section to reference commonly-implemented schemas that are not covered by this white paper. |
| | | Updated guidance on Chassis schema requirements. |
| | | Updated list of equipment types to match additions in newer schema releases. |
| | | Various grammatical and typographical corrections. |
| 1.0 | 2020-02-21 | Initial release. |