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# Redfish for CXL Readme

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# 1 Foreword

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This Informational Specification covers a proposal to add CXL support to Redfish.

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The following files are part of the Redfish for CXL development effort:

**Mockup** folder containing:

- Chassis/CXL-Chassis - Mockup for CXL computer system chassis.
- Chassis/CXL1 - Mockup for locally attached CXL Type 1 device.
- Chassis/CXL2 - Mockup for locally attached CXL Type 2 device.
- Chassis/CXL3 - Mockup for locally attached CXL Type 3 device.
- Chassis/PCXL1 - Mockup for CXL Type 1 device attached through fabric.
- Chassis/PCXL2 - Mockup for CXL Type 2 device attached through fabric.
- Chassis/PCXL3 - Mockup for CXL Type 3 device attached through fabric.
- Fabrics/CXL - Mockup for CXL Fabric with switches, ports, endpoints, zones and connections.
- Systems/CXL-System - Mockup for CXL computer system with processors, memory and CXL ports.

**Metadata** folder containing new or updated Redfish schema files. The contents of these schema files are detailed in the Schema Reference Guide section of this document.

**Redfish CXL Device Models.PDF** - Presentation describing the Redfish CXL Device and Fabric management data models.

## 1.1 How can I provide feedback?

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

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

## 1.2 Where can I find more information?

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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:** <http://www.redfishforum.com> User forum monitored by DMTF Redfish personnel to answer questions about any Redfish-related topics.
- **DMTF Github Repositories:** <http://www.github.com/DMTF> Open source tools and libraries for working with the Redfish API.
- **Redfish Standards:** <http://www.dmtf.org/standards/redfish> Schemas, specs, mockups, white papers, FAQ, educational material and more.
- **DMTF Redfish Forum** (Working group that maintains the Redfish standard): <http://www.dmtf.org/standards/spmf> Companies involved, upcoming schedules and future work, charter, and information about joining.

## 1.3 Using the reference guide

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

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

## 1.4 Common Properties

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



## 2 Schema Reference Guide

### 2.1 Chassis 1.20.0

Version	v1.20	v1.19	v1.18	v1.17	v1.16	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	...
Release	2021.	2021.4	2021.3	2021.2	2021.1	2020.4	2020.3	2020.2	2020.1	2019.4	2019.2	...

#### 2.1.1 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.

#### 2.1.2 URIs

/redfish/v1/Chassis/{ChassisId}

#### 2.1.3 Properties

Property	Type	Attributes	Notes
<b>Assembly</b> (v1.6+) {}	object		The link to the assembly associated with this chassis. See the <i>Assembly</i> schema for details on this property.
<b>AssetTag</b>	string	<i>read-write</i> (null)	The user-assigned asset tag of this chassis.
<b>Certificates</b> (v1.15+) {}	object		The link to a collection of certificates for device identity and attestation. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
<b>ChassisType</b>	string (enum)	<i>read-only</i> <i>required</i>	The type of physical form factor of the chassis. <i>For the possible property values, see ChassisType in Property details.</i>
<b>Controls</b> (v1.17+) {}	object		The link to the collection of controls located in this chassis. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Control</i> . See the Control schema for details.

Property	Type	Attributes	Notes
}			
<b>DepthMm</b> (v1.4+)	number (mm)	<i>read-only</i> (null)	The depth of the chassis.
<b>Drives</b> (v1.14+){	object		The link to the collection of drives within this chassis. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Drive</i> . See the Drive schema for details.
}			
<b>ElectricalSourceManagerURIs</b> (v1.18+)[ ]	array (URI) (string, null)	<i>read-write</i>	The URIs of the management interfaces for the upstream electrical source connections for this chassis.
<b>ElectricalSourceNames</b> (v1.18+)[ ]	array (string, null)	<i>read-write</i>	The names of the upstream electrical sources, such as circuits or outlets, connected to this chassis.
<b>EnvironmentalClass</b> (v1.9+)	string (enum)	<i>read-only</i> (null)	The ASHRAE Environmental Class for this chassis. <i>For the possible property values, see EnvironmentalClass in Property details.</i>
<b>EnvironmentMetrics</b> (v1.15+){}	object		The link to the environment metrics for this chassis. See the <i>EnvironmentMetrics</i> schema for details on this property.
<b>FabricAdapters</b> (v1.20+){	object		The link to the collection of fabric adapters located in this chassis. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>FabricAdapter</i> . See the FabricAdapter schema for details.
}			
<b>HeightMm</b> (v1.4+)	number (mm)	<i>read-only</i> (null)	The height of the chassis.
<b>IndicatorLED</b> (deprecated v1.14)	string (enum)	<i>read-write</i> (null)	The state of the indicator LED, which identifies the chassis. <i>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.</i>
<b>Links</b> {	object		The links to other resources that are related to this resource.
<b>Cables</b> (v1.17+)[ {} ]	array (object)		An array of links to the cables connected to this chassis. See the <i>Cable</i> schema for details on this property.
<b>Cables@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.

Property	Type	Attributes	Notes
<b>ComputerSystems</b> [{ }]	array (object)		An array of links to the computer systems that this chassis directly and wholly contains. See the <i>ComputerSystem</i> schema for details on this property.
<b>ComputerSystems@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>ContainedBy</b> {	object		The link to the chassis that contains this chassis.
<b>@odata.id</b>	string	<i>read-write</i>	Link to another Chassis resource.
}			
<b>Contains</b> [{	array		An array of links to any other chassis that this chassis has in it.
<b>@odata.id</b>	string	<i>read-write</i>	Link to another Chassis resource.
}]			
<b>Contains@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>CooledBy</b> [{	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.
<b>@odata.id</b>	string (URI)	<i>read-only</i>	The unique identifier for a resource.
}]			
<b>CooledBy@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Drives</b> (v1.2+) [{ }]	array (object)		An array of links to the drives located in this chassis. See the <i>Drive</i> schema for details on this property.
<b>Drives@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Facility</b> (v1.11+) { }	object		The link to the facility that contains this chassis. See the <i>Facility</i> schema for details on this property.
<b>ManagedBy</b> [{ }]	array (object)		An array of links to the managers responsible for managing this chassis. See the <i>Manager</i> schema for details on this property.
<b>ManagedBy@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>ManagersInChassis</b> (v1.2+) [{ }]	array (object)		An array of links to the managers located in this chassis. See the <i>Manager</i> schema for details on this property.
<b>ManagersInChassis@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> { }	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.

Property	Type	Attributes	Notes
<b>PCleDevices</b> (v1.4+, deprecated v1.10 [{	array		An array of links to the PCIe devices located in this chassis. <i>Deprecated in v1.10 and later. This property has been deprecated in favor of the PCleDevices resource collection in the root of this resource.</i>
<b>@odata.id</b>	string	read-only	Link to a PCIeDevice resource. See the Links section and the PCIeDevice schema for details.
}]			
<b>PCleDevices@odata.count</b>	integer	read-only	The number of items in a collection.
<b>PowerOutlets</b> (v1.18+) [{ }	array (object)		An array of links to the outlets that provide power to this chassis. See the Outlet schema for details on this property.
<b>PowerOutlets@odata.count</b>	integer	read-only	The number of items in a collection.
<b>PoweredBy</b> [{	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.
<b>@odata.id</b>	string (URI)	read-only	The unique identifier for a resource.
}]			
<b>PoweredBy@odata.count</b>	integer	read-only	The number of items in a collection.
<b>Processors</b> (v1.9+) [{	array		An array of links to the processors located in this chassis.
<b>@odata.id</b>	string	read-only	Link to a Processor resource. See the Links section and the Processor schema for details.
}]			
<b>Processors@odata.count</b>	integer	read-only	The number of items in a collection.
<b>ResourceBlocks</b> (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.
<b>ResourceBlocks@odata.count</b>	integer	read-only	The number of items in a collection.
<b>Storage</b> (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.
<b>Storage@odata.count</b>	integer	read-only	The number of items in a collection.
<b>Switches</b> (v1.7+) [{ }	array (object)		An array of links to the switches located in this chassis. See the Switch schema for details on this property.
<b>Switches@odata.count</b>	integer	read-only	The number of items in a collection.
}			

Property	Type	Attributes	Notes
<b>Location</b> (v1.2+) {}	object		The location of the chassis. See the <i>Resource</i> schema for details on this property.
<b>LocationIndicatorActive</b> (v1.14+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource.
<b>LogServices</b> {	object		The link to the logs for this chassis. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>LogService</i> . See the <i>LogService</i> schema for details.
}			
<b>Manufacturer</b>	string	<i>read-only</i> (null)	The manufacturer of this chassis.
<b>MaxPowerWatts</b> (v1.12+)	number (Watts)	<i>read-only</i> (null)	The upper bound of the total power consumed by the chassis.
<b>Measurements</b> (v1.15+, deprecated v1.19 [{}])	array (object)		An array of DSP0274-defined measurement blocks. See the <i>SoftwareInventory</i> schema for details on this property. <i>Deprecated in v1.19 and later. This property has been deprecated in favor of the ComponentIntegrity resource.</i>
<b>MediaControllers</b> (v1.11+) {	object		The link to the collection of media controllers located in this chassis. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>MediaController</i> . See the <i>MediaController</i> schema for details.
}			
<b>Memory</b> (v1.11+) {	object		The link to the collection of memory located in this chassis. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Memory</i> . See the <i>Memory</i> schema for details.
}			
<b>MemoryDomains</b> (v1.11+) {	object		The link to the collection of memory domains located in this chassis. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>MemoryDomain</i> . See the <i>MemoryDomain</i> schema for details.
}			
<b>MinPowerWatts</b> (v1.12+)	number (Watts)	<i>read-only</i> (null)	The lower bound of the total power consumed by the chassis.
<b>Model</b>	string	<i>read-only</i> (null)	The model number of the chassis.

Property	Type	Attributes	Notes
<b>NetworkAdapters</b> (v1.4+){	object		The link to the collection of network adapters associated with this chassis. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>NetworkAdapter</i> . See the <i>NetworkAdapter</i> schema for details.
}			
<b>PartNumber</b>	string	read-only (null)	The part number of the chassis.
<b>PCleDevices</b> (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 <i>PCleDevice</i> . See the <i>PCleDevice</i> schema for details.
}			
<b>PCleSlots</b> (v1.8+){}	object		The link to the PCIe slot properties for this chassis. See the <i>PCleSlots</i> schema for details on this property.
<b>PhysicalSecurity</b> (v1.1+){	object		The state of the physical security sensor.
<b>IntrusionSensor</b> (v1.1+)	string (enum)	read-write (null)	This indicates the known state of the physical security sensor, such as if it is hardware intrusion detected. <i>For the possible property values, see IntrusionSensor in Property details.</i>
<b>IntrusionSensorNumber</b> (v1.1+)	integer	read-only (null)	A numerical identifier to represent the physical security sensor.
<b>IntrusionSensorReArm</b> (v1.1+)	string (enum)	read-only (null)	The method that restores this physical security sensor to the normal state. <i>For the possible property values, see IntrusionSensorReArm in Property details.</i>
}			
<b>Power</b> (deprecated v1.15){}	object		The link to the power properties, or power supplies, power policies, and sensors, for this chassis. See the <i>Power</i> schema for details on this property. <i>Deprecated in v1.15 and later. This link has been deprecated in favor of the PowerSubsystem link property.</i>
<b>PowerState</b> (v1.0.1+)	string (enum)	read-only (null)	The current power state of the chassis. <i>For the possible property values, see PowerState in Property details.</i>
<b>PowerSubsystem</b> (v1.15+){}	object		The link to the power subsystem properties for this chassis. See the <i>PowerSubsystem</i> schema for details on this property.
<b>Processors</b> (v1.20+){	object		The link to the collection of processors located in this chassis. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>Processor</i> . See the <i>Processor</i> schema for details.

Property	Type	Attributes	Notes
}			
<b>Sensors</b> (v1.9+) {	object		The link to the collection of sensors located in the equipment and sub-components. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Sensor</i> . See the Sensor schema for details.
}			
<b>SerialNumber</b>	string	<i>read-only</i> (null)	The serial number of the chassis.
<b>SKU</b>	string	<i>read-only</i> (null)	The SKU of the chassis.
<b>SparePartNumber</b> (v1.16+)	string	<i>read-only</i> (null)	The spare part number of the chassis.
<b>Status</b> {}	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.
<b>Thermal</b> (deprecated v1.15) {}	object		The link to the thermal properties, such as fans, cooling, and sensors, for this chassis. See the <i>Thermal</i> schema for details on this property. <i>Deprecated in v1.15 and later. This link has been deprecated in favor of the ThermalSubsystem link property.</i>
<b>ThermalSubsystem</b> (v1.15+) {}	object		The link to the thermal subsystem properties for this chassis. See the <i>ThermalSubsystem</i> schema for details on this property.
<b>UUID</b> (v1.7+)	string	<i>read-only</i> (null)	The UUID for this chassis.
<b>WeightKg</b> (v1.4+)	number (kg)	<i>read-only</i> (null)	The weight of the chassis.
<b>WidthMm</b> (v1.4+)	number (mm)	<i>read-only</i> (null)	The width of the chassis.

## 2.1.4 Actions

### 2.1.4.1 Reset

#### Description

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

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

## Action parameters

Parameter Name	Type	Attributes	Notes
<b>ResetType</b>	string (enum)	<i>optional</i>	The type of reset. <i>For the possible property values, see ResetType in Property details.</i>

## Request Example

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

## 2.1.5 Property details

### 2.1.5.1 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.
IPBasedDrive (v1.3+)	A chassis in a drive form factor with IP-based network connections.
Module	A small, typically removable, chassis or card that contains devices for a particular subsystem or function.
Other	A chassis that does not fit any of these definitions.
Pod	A collection of equipment racks in a large, likely transportable, container.
Rack	An equipment rack, typically a 19-inch wide freestanding unit.



string	Description
RackGroup (v1.4+)	A group of racks that form a single entity or share infrastructure.
RackMount	A single-system chassis designed specifically for mounting in an equipment rack.
Row	A collection of equipment racks.
Shelf	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis that must be plugged into a multi-system chassis to function normally.
Sidecar	A chassis that mates mechanically with another chassis to expand its capabilities or capacity.
Sled	An enclosed or semi-enclosed, system chassis that must be 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.

### 2.1.5.2 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'.

### 2.1.5.3 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.

string	Description
Unknown <i>(deprecated v1.2)</i>	The state of the indicator LED cannot be determined. <i>Deprecated in v1.2 and later. This value has been deprecated in favor of returning null if the state is unknown.</i>

#### 2.1.5.4 IntrusionSensor:

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

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

#### 2.1.5.5 IntrusionSensorReArm:

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

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

#### 2.1.5.6 PowerState:

The current power state of the chassis.

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

### 2.1.5.7 ResetType:

The type of reset.

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

### 2.1.6 Example response

```
{
  "@odata.type": "#Chassis.v1_19_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"
            }
        ],
        "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1U"
}

```

## 2.2 CXLLogicalDevice 1.0.0

Version	v1.0
Release	2021.

### 2.2.1 Description

The schema definition for the CXLLogicalDevice Resource. It represents the properties of a CXL logical device within PCIe device.

### 2.2.2 URIs

/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/{CXLLogicalDeviceId}  
 /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/{CXLLogicalDeviceId}  
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/{CXLLogicalDeviceId}  
 /redfish/v1/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/CXLLogicalDevices/{CXLLogicalDeviceId}

### 2.2.3 Properties

Property	Type	Attributes	Notes
<b>CXLSemanticsSupported</b> [ ]	array (string (enum))	<i>read-only</i>	The CXL semantics supported by a CXL logical device. <i>For the possible property values, see CXLSemanticsSupported in Property details.</i>
<b>Identifiers</b> [ { } ]	array (object)		Identifiers for this CXL logical device. See the <i>Resource</i> schema for details on this property.
<b>Links</b> {	object		The links to other Resources that are related to this Resource.
<b>Endpoints</b> [ {	array		An array of links to the endpoints that connect to this CXL logical device.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
} ]			
<b>Endpoints@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>MemoryChunks</b> [ {	array		An array of links to the memory chunks owned by this CXL logical device.

Property	Type	Attributes	Notes
<b>@odata.id</b>	string	<i>read-only</i>	Link to a MemoryChunks resource. See the Links section and the <i>MemoryChunks</i> schema for details.
}]			
<b>MemoryChunks@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>MemoryDomains</b> [{	array		An array of links to the memory domain associated with this CXL logical device.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a MemoryDomain resource. See the Links section and the <i>MemoryDomain</i> schema for details.
}]			
<b>MemoryDomains@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PCleDevice</b> {	object		The link to the PCIe device on which this CXL logical device resides. See the <i>PCleDevice</i> schema for details on this property.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCleDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
<b>PCleFunctions</b> [{	array		An array of links to the PCIe functions assigned to this CXL logical device.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCleFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			
<b>PCleFunctions@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
}			
<b>Status</b> {}	object		The status and health of the Resource and its subordinate or dependent Resources. See the <i>Resource</i> schema for details on this property.

## 2.2.4 Property details

### 2.2.4.1 CXLSemanticsSupported:

The CXL semantics supported by a CXL logical device.

string	Description
CXLcache	CXL caching protocol semantic.
CXLio	CXL I/O semantic.
CXLmem	CXL memory access semantic.

## 2.2.5 Example response

```
{
  "@odata.type": "#CXLLogicalDevice.v1_0_0.CXLLogicalDevice",
  "Id": "1",
  "Name": "CXL Logical Device Type 1",
  "Description": "Locally attached CXL Logical Device Type 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK",
    "HealthRollup": "OK"
  },
  "Identifiers": [
    {
      "DurableName": "4C-1D-96-FF-FE-DD-D8-35:1",
      "DurableNameFormat": "GCXLID"
    }
  ],
  "CXLSemanticsSupported": [
    "CXLio",
    "CXLcache"
  ],
  "Links": {
    "PCIeDevice": {
      "@odata.id": "/redfish/v1/Chassis/CXL1/PCIeDevices/1"
    },
    "PCIeFunctions": [
      {
        "@odata.id": "/redfish/v1/Chassis/CXL1/PCIeDevices/1/PCIeFunctions/1"
      }
    ],
    "Oem": {}
  },
  "Oem": {},
  "@odata.id": "/redfish/v1/Chassis/CXL1/PCIeDevices/1/CXLLogicalDevices/1",
  "@Redfish.Copyright": "Copyright 2014-2021 DMTF. For the full DMTF copyright policy, see http://www.dmtf.org/ab"
}
```

## 2.3 Endpoint 1.7.0

Version	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2021.	2021.1	2020.3	2019.4	2018.3	2018.2	2017.3	2016.2

### 2.3.1 Description

The Endpoint schema contains the properties of an endpoint resource that represents the properties of an entity that sends or receives protocol-defined messages over a transport.

### 2.3.2 URIs

/redfish/v1/Fabrics/{FabricId}/Endpoints/{EndpointId}

/redfish/v1/Storage/{StorageId}/Endpoints/{EndpointId}

/redfish/v1/StorageServices/{StorageServiceId}/Endpoints/{EndpointId}

### 2.3.3 Properties

Property	Type	Attributes	Notes
<b>ConnectedEntities</b> [ {	array		All the entities connected to this endpoint.
<b>EntityLink</b> {	object		The link to the associated entity.
<b>@odata.id</b>	string (URI)	<i>read-only</i>	The unique identifier for a resource.
}			
<b>EntityPcId</b> {	object		The PCI ID of the connected entity.
<b>ClassCode</b> (v1.2+)	string	<i>read-only (null)</i>	The Class Code, Subclass, and Programming Interface code of this PCIe function.
<b>DeviceId</b>	string	<i>read-only (null)</i>	The Device ID of this PCIe function.
<b>FunctionNumber</b> (v1.2+)	integer	<i>read-only (null)</i>	The PCI ID of the connected entity.
<b>SubsystemId</b>	string	<i>read-only (null)</i>	The Subsystem ID of this PCIe function.
<b>SubsystemVendorId</b>	string	<i>read-only (null)</i>	The Subsystem Vendor ID of this PCIe function.



Property	Type	Attributes	Notes
<b>VendorId</b>	string	<i>read-only (null)</i>	The Vendor ID of this PCIe function.
}			
<b>EntityRole</b>	string (enum)	<i>read-only (null)</i>	The role of the connected entity. <i>For the possible property values, see EntityRole in Property details.</i>
<b>EntityType</b>	string (enum)	<i>read-only (null)</i>	The type of the connected entity. <i>For the possible property values, see EntityType in Property details.</i>
<b>GenZ</b> (v1.4+) {	object	<i>(null)</i>	The Gen-Z related properties for the entity.
<b>AccessKey</b> (v1.4+, deprecated v1.6)	string	<i>read-write (null)</i>	The Access Key for the entity. <i>Deprecated in v1.6 and later. This property has been deprecated in favor of the ConnectionKeys property in the Connection resource.</i>
<b>GCID</b> (v1.4+) {	object	<i>(null)</i>	The Global Component ID (GCID) for the entity.
<b>CID</b> (v1.4+)	string	<i>read-write (null)</i>	The component identifier portion of the GCID for the entity.
<b>SID</b> (v1.4+)	string	<i>read-write (null)</i>	The subnet identifier portion of the GCID for the entity.
}			
<b>RegionKey</b> (v1.4+, deprecated v1.6)	string	<i>read-write (null)</i>	The Region Key for the entity. <i>Deprecated in v1.6 and later. This property has been deprecated in favor of the ConnectionKeys property in the Connection resource.</i>
}			
<b>Identifiers</b> [{ }]	array (object)		Identifiers for the remote entity. See the <i>Resource</i> schema for details on this property.
<b>Oem</b> { }	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PciClassCode</b> (deprecated v1.2)	string	<i>read-only (null)</i>	The Class Code, Subclass, and Programming Interface code of this PCIe function. <i>Deprecated in v1.2 and later. This property has been deprecated in favor of the ClassCode property inside the EntityPcild object.</i>
<b>PciFunctionNumber</b> (deprecated v1.2)	integer	<i>read-only (null)</i>	The PCI ID of the connected entity. <i>Deprecated in v1.2 and later. This property has been deprecated in favor of the FunctionNumber property inside the EntityPcild object.</i>
}]			

Property	Type	Attributes	Notes
<b>EndpointProtocol</b>	string (enum)	<i>read-only</i> (null)	The protocol supported by this endpoint. <i>For the possible property values, see EndpointProtocol in Property details.</i>
<b>HostReservationMemoryBytes</b>	integer (bytes)	<i>read-only</i> (null)	The amount of memory in bytes that the host should allocate to connect to this endpoint.
<b>Identifiers</b> [{ }]	array (object)		Identifiers for this endpoint. See the <i>Resource</i> schema for details on this property.
<b>IPTransportDetails</b> (v1.1+) [{ }	array		An array of details for each IP transport supported by this endpoint. The array structure can model multiple IP addresses for this endpoint.
<b>IPv4Address</b> (v1.1+) { }	object		The IPv4 addresses assigned to the endpoint. See the <i>IPAddresses</i> schema for details on this property.
<b>IPv6Address</b> (v1.1+) { }	object		The IPv6 addresses assigned to the endpoint. See the <i>IPAddresses</i> schema for details on this property.
<b>Port</b> (v1.1+)	number	<i>read-only</i>	The UDP or TCP port number used by the endpoint.
<b>TransportProtocol</b> (v1.1+)	string (enum)	<i>read-only</i>	The protocol used by the connection entity. <i>For the possible property values, see TransportProtocol in Property details.</i>
}]			
<b>Links</b> {	object		The links to other resources that are related to this resource.
<b>AddressPools</b> (v1.4+) [{ }]	array (object)		An array of links to the address pools associated with this endpoint. See the <i>AddressPool</i> schema for details on this property.
<b>AddressPools@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>ConnectedPorts</b> (v1.4+) [{ }	array		An array of links to the ports that connect to this endpoint.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}]			
<b>ConnectedPorts@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Connections</b> (v1.5+) [{ }]	array (object)		The connections to which this endpoint belongs. See the <i>Connection</i> schema for details on this property.
<b>Connections@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>MutuallyExclusiveEndpoints</b> [{ }	array		An array of links to the endpoints that cannot be used in zones if this endpoint is in a zone.
<b>@odata.id</b>	string	<i>read-only</i>	Link to another Endpoint resource.

Property	Type	Attributes	Notes
}]			
<a href="#">MutuallyExclusiveEndpoints@odata.count</a>	integer	<i>read-only</i>	The number of items in a collection.
<b>NetworkDeviceFunction</b> (v1.1+)[{}]	array (object)		When NetworkDeviceFunction resources are present, this array contains links to the network device functions that connect to this endpoint. See the <i>NetworkDeviceFunction</i> schema for details on this property.
<a href="#">NetworkDeviceFunction@odata.count</a>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>Ports</b> [{	array		An array of links to the physical ports associated with this endpoint.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Port resource. See the Links section and the <i>Port</i> schema for details.
}]			
<a href="#">Ports@odata.count</a>	integer	<i>read-only</i>	The number of items in a collection.
<b>Zones</b> (v1.6+)[{}]	array (object)		The zones to which this endpoint belongs. See the <i>Zone</i> schema for details on this property.
<a href="#">Zones@odata.count</a>	integer	<i>read-only</i>	The number of items in a collection.
}			
<b>PcId</b> {	object		The PCI ID of the endpoint.
<b>ClassCode</b> (v1.2+)	string	<i>read-only</i> (null)	The Class Code, Subclass, and Programming Interface code of this PCIe function.
<b>DeviceId</b>	string	<i>read-only</i> (null)	The Device ID of this PCIe function.
<b>FunctionNumber</b> (v1.2+)	integer	<i>read-only</i> (null)	The PCI ID of the connected entity.
<b>SubsystemId</b>	string	<i>read-only</i> (null)	The Subsystem ID of this PCIe function.
<b>SubsystemVendorId</b>	string	<i>read-only</i> (null)	The Subsystem Vendor ID of this PCIe function.
<b>VendorId</b>	string	<i>read-only</i> (null)	The Vendor ID of this PCIe function.
}			

Property	Type	Attributes	Notes
<b>Redundancy</b> [ {	array		Redundancy information for the lower-level endpoints supporting this endpoint.
<b>@odata.id</b>	string (URI)	<i>read-only</i>	The unique identifier for a resource.
}]			
<b>Status</b> { }	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.

## 2.3.4 Property details

### 2.3.4.1 EndpointProtocol:

The protocol supported by this endpoint.

string	Description
AHCI	Advanced Host Controller Interface (AHCI).
CXL	Compute Express Link.
DisplayPort	DisplayPort.
DVI	DVI.
Ethernet	Ethernet.
FC	Fibre Channel.
FCoE	Fibre Channel over Ethernet (FCoE).
FCP	Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON).
FTP	File Transfer Protocol (FTP).
GenZ	GenZ.
HDMI	HDMI.
HTTP	Hypertext Transport Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
I2C	Inter-Integrated Circuit Bus.

string	Description
InfiniBand	InfiniBand.
iSCSI	Internet SCSI.
iWARP	Internet Wide Area RDMA Protocol (iWARP).
MultiProtocol	Multiple Protocols.
NFSv3	Network File System (NFS) version 3.
NFSv4	Network File System (NFS) version 4.
NVLink	NVLink.
NVMe	Non-Volatile Memory Express (NVMe).
NVMeOverFabrics	NVMe over Fabrics.
OEM	OEM-specific.
PCIe	PCI Express.
RoCE	RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2.
SAS	Serial Attached SCSI.
SATA	Serial AT Attachment.
SFTP	SSH File Transfer Protocol (SFTP).
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS).
TCP	Transmission Control Protocol (TCP).
TFTP	Trivial File Transfer Protocol (TFTP).
UDP	User Datagram Protocol (UDP).
UHCI	Universal Host Controller Interface (UHCI).
USB	Universal Serial Bus (USB).
VGA	VGA.

#### 2.3.4.2 EntityRole:

The role of the connected entity.

string	Description
Both	The entity can both send and receive commands, messages, and other requests to or from other entities on the fabric.
Initiator	The entity sends commands, messages, or other types of requests to other entities on the fabric, but cannot receive commands from other entities.
Target	The entity receives commands, messages, or other types of requests from other entities on the fabric, but cannot send commands to other entities.

### 2.3.4.3 EntityType:

The type of the connected entity.

string	Description
AccelerationFunction (v1.3+)	The entity is an acceleration function realized through a device, such as an FPGA.
Bridge	The entity is a PCI(e) bridge.
CXLDevice (v1.7+)	The entity is a CXL Logical Device.
DisplayController	The entity is a display controller.
Drive	The entity is a drive.
FabricBridge (v1.4+)	The entity is a fabric bridge.
Manager (v1.5+)	The entity is a manager.
MediaController (v1.4+)	The entity is a media controller.
Memory (v1.7+)	The entity is a memory device.
MemoryChunk (v1.4+)	The entity is a memory chunk.
NetworkController	The entity is a network controller.
Processor	The entity is a processor.
RootComplex	The entity is a PCI(e) root complex.
StorageExpander	The entity is a storage expander.
StorageInitiator	The entity is a storage initiator.
StorageSubsystem (v1.6+)	The entity is a storage subsystem.
Switch (v1.4+)	The entity is a switch, not an expander. Use <code>Expander</code> for expanders.
Volume (v1.1+)	The entity is a volume.

#### 2.3.4.4 TransportProtocol:

The protocol used by the connection entity.

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

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

### 2.3.5 Example response

```
{
  "@odata.type": "#Endpoint.v1_6_1.Endpoint",
  "Id": "Drive1",
  "Name": "SAS Drive",
  "Description": "The SAS Drive in Enclosure 2 Bay 0",
  "EndpointProtocol": "SAS",
  "ConnectedEntities": [
    {
      "EntityType": "Drive",
      "EntityRole": "Target",
      "Identifiers": [
        {
          "DurableNameFormat": "NAA",
          "DurableName": "32ADF365C6C1B7C3"
        }
      ],
      "Oem": {}
    }
  ],
}
```



```

    "Links": {
      "MutuallyExclusiveEndpoints": [
        {
          "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Enclosure2"
        }
      ],
      "Ports": [
        {
          "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Ports/8"
        },
        {
          "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch2/Ports/8"
        }
      ],
      "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Drive1"
  }

```

## 2.4 FabricAdapter 1.2.0

Version	v1.2	v1.1	v1.0
Release	2021.3	2021.2	2019.4

### 2.4.1 Description

A FabricAdapter represents the physical fabric adapter capable of connecting to an interconnect fabric. Examples include but are not limited to Ethernet, NVMe over Fabrics, Gen-Z, and SAS fabric adapters.

### 2.4.2 URIs

/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}  
 /redfish/v1/Systems/{SystemId}/FabricAdapters/{FabricAdapterId}

### 2.4.3 Properties

Property	Type	Attributes	Notes
ASICManufacturer	string	read-only (null)	The manufacturer name for the ASIC of this fabric adapter.

Property	Type	Attributes	Notes
<b>ASICPartNumber</b>	string	<i>read-only (null)</i>	The part number for the ASIC on this fabric adapter.
<b>ASICRevisionIdentifier</b>	string	<i>read-only (null)</i>	The revision identifier for the ASIC on this fabric adapter.
<b>FirmwareVersion</b>	string	<i>read-only (null)</i>	The firmware version of this fabric adapter.
<b>GenZ {</b>	object		The Gen-Z specific properties for this fabric adapter.
<b>MSDT {</b>	object		The Multi Subnet Destination Table for the component. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>RouteEntry</i> . See the <i>RouteEntry</i> schema for details.
<b>}</b>			
<b>PIDT [ ]</b>	array (string, null)	<i>read-write</i>	An array of table entry values for the Packet Injection Delay Table.
<b>RITable [ ]</b>	array (string, null)	<i>read-write</i>	An array of table entry values for the Responder Interface Table.
<b>RequestorVCAT {</b>	object		The Requestor Virtual Channel Action Table for the component. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>VCATEntry</i> . See the <i>VCATEntry</i> schema for details.
<b>}</b>			
<b>ResponderVCAT {</b>	object		The Responder Virtual Channel Action Table for the component. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>VCATEntry</i> . See the <i>VCATEntry</i> schema for details.
<b>}</b>			
<b>SSDT {</b>	object		The Single Subnet Destination Table for the component. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>RouteEntry</i> . See the <i>RouteEntry</i> schema for details.
<b>}</b>			
<b>}</b>			
<b>Links {</b>	object		The links to other Resources that are related to this Resource.
<b>Endpoints [ {</b>	array		An array of links to the endpoints that represent the logical fabric connection to this fabric adapter.

Property	Type	Attributes	Notes
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
<b>Endpoints@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PCleDevices</b> (v1.2+) [{	array		An array of links to the PCIe devices associated with this fabric adapter.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCIeDevice resource. See the Links section and the <i>PCIeDevice</i> schema for details.
}]			
<b>PCleDevices@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
}			
<b>Location</b> (v1.1+) {}	object		The location of the fabric adapter. See the <i>Resource</i> schema for details on this property.
<b>Manufacturer</b>	string	<i>read-only (null)</i>	The manufacturer or OEM of this fabric adapter.
<b>Model</b>	string	<i>read-only (null)</i>	The model string for this fabric adapter.
<b>PartNumber</b>	string	<i>read-only (null)</i>	The part number for this fabric adapter.
<b>PCIeInterface</b> {	object		The PCIe interface details for this fabric adapter. See the <i>PCIeDevice</i> schema for details on this property.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCIeInterface resource. See the Links section and the <i>PCIeDevice</i> schema for details.
}			
<b>Ports</b> {	object		The link to the collection of ports that exist on the fabric adapter. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
<b>SerialNumber</b>	string	<i>read-only (null)</i>	The serial number for this fabric adapter.
<b>SKU</b>	string	<i>read-only (null)</i>	The manufacturer SKU for this fabric adapter.

Property	Type	Attributes	Notes
<b>SparePartNumber</b>	string	<i>read-only</i> (null)	The spare part number for this fabric adapter.
<b>Status</b> {}	object		The status and health of the Resource and its subordinate or dependent Resources. See the <i>Resource</i> schema for details on this property.
<b>UUID</b>	string	<i>read-only</i> (null)	The UUID for this fabric adapter.

## 2.4.4 Example response

```
{
  "@odata.type": "#FabricAdapter.v1_2_0.FabricAdapter",
  "Id": "Bridge",
  "Name": "Gen-Z Bridge",
  "Manufacturer": "Contoso",
  "Model": "Gen-Z Bridge Model X",
  "PartNumber": "975999-001",
  "SparePartNumber": "152111-A01",
  "SKU": "Contoso 2-port Gen-Z Bridge",
  "SerialNumber": "2M220100SL",
  "ASICRevisionIdentifier": "A0",
  "ASICPartNumber": "53312",
  "ASICManufacturer": "Contoso",
  "FirmwareVersion": "7.4.10",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Ports": {
    "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1/Ports"
  },
  "PCIeInterface": {
    "MaxPCIeType": "Gen4",
    "MaxLanes": 64,
    "PCIeType": "Gen4",
    "LanesInUse": 64
  },
  "UUID": "45724775-ed3b-2214-1313-9865200c1cc1",
  "Links": {
    "Endpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/GenZ/Endpoints/3"
      }
    ]
  },
  "GenZ": {
    "SSDT": {
```

[illegible]

```

        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568",
        "0x12234568"
    ],
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/GenZ-example/FabricAdapters/1"
}

```

## 2.5 Memory 1.15.0

Version	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	...
Release	2021.	2021.4	2021.2	2021.1	2020.4	2020.3	2019.4	2019.2	2018.3	2018.2	2018.1	...

### 2.5.1 Description

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

### 2.5.2 URIs

```

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

```

### 2.5.3 Properties

Property	Type	Attributes	Notes
<b>AllocationAlignmentMiB</b> (v1.2+)	integer (mebibytes)	<i>read-only</i> ( <i>null</i> )	The boundary that memory regions are allocated on, measured in mebibytes (MiB).
<b>AllocationIncrementMiB</b> (v1.2+)	integer (mebibytes)	<i>read-only</i> ( <i>null</i> )	The size of the smallest unit of allocation for a memory region in mebibytes (MiB).
<b>AllowedSpeedsMHz</b> [ ]	array (MHz) (integer)	<i>read-only</i>	Speeds supported by this memory device.
<b>Assembly</b> (v1.4+) {}	object		The link to the assembly resource associated with this memory device. See the <i>Assembly</i> schema for details on this property.
<b>BaseModuleType</b>	string (enum)	<i>read-only</i> ( <i>null</i> )	The base module type of the memory device. <i>For the possible property values, see BaseModuleType in Property details.</i>
<b>BusWidthBits</b>	integer	<i>read-only</i> ( <i>null</i> )	The bus width, in bits.
<b>CacheSizeMiB</b> (v1.4+)	integer (mebibytes)	<i>read-only</i> ( <i>null</i> )	Total size of the cache portion memory in MiB.
<b>CapacityMiB</b>	integer (mebibytes)	<i>read-only</i> ( <i>null</i> )	Memory capacity in mebibytes (MiB).
<b>Certificates</b> (v1.11+) {	object		The link to a collection of certificates for device identity and attestation. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
<b>ConfigurationLocked</b> (v1.7+)	boolean	<i>read-only</i> ( <i>null</i> )	An indication of whether the configuration of this memory device is locked and cannot be altered.
<b>DataWidthBits</b>	integer	<i>read-only</i> ( <i>null</i> )	Data width in bits.
<b>DeviceID</b> (deprecated v1.3)	string	<i>read-only</i> ( <i>null</i> )	Device ID. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of ModuleProductID.</i>
<b>DeviceLocator</b> (deprecated v1.9)	string	<i>read-only</i> ( <i>null</i> )	Location of the memory device in the platform. <i>Deprecated in v1.9 and later. This property has been deprecated in favor of the ServiceLabel property within Location.</i>
<b>Enabled</b> (v1.12+)	boolean	<i>read-write</i>	An indication of whether this memory is enabled.

Property	Type	Attributes	Notes
<b>EnvironmentMetrics</b> (v1.11+) {}	object		The link to the environment metrics for this memory. See the <i>EnvironmentMetrics</i> schema for details on this property.
<b>ErrorCorrection</b>	string (enum)	read-only (null)	Error correction scheme supported for this memory device. <i>For the possible property values, see ErrorCorrection in Property details.</i>
<b>FirmwareApiVersion</b>	string	read-only (null)	Version of API supported by the firmware.
<b>FirmwareRevision</b>	string	read-only (null)	Revision of firmware on the memory controller.
<b>FunctionClasses</b> (deprecated v1.3) []	array (string)	read-only	Function classes by the memory device. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of OperatingMemoryModes at the root of the resource, or MemoryClassification found within RegionSet.</i>
<b>IsRankSpareEnabled</b>	boolean	read-only (null)	An indication of whether rank spare is enabled for this memory device.
<b>IsSpareDeviceEnabled</b>	boolean	read-only (null)	An indication of whether a spare device is enabled for this memory device.
<b>Links</b> (v1.2+) {	object		The links to other resources that are related to this resource.
<b>Chassis</b> (v1.2+) {	object		The link to the chassis that contains this memory device. See the <i>Chassis</i> schema for details on this property.
<b>@odata.id</b>	string	read-only	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
<b>Endpoints</b> (v1.15+) [{	array		An array of links to the endpoints that connect to this memory.
<b>@odata.id</b>	string	read-only	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
<b>Endpoints@odata.count</b>	integer	read-only	The number of items in a collection.
<b>Oem</b> {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>Processors</b> (v1.11+) [{	array		An array of links to the processors associated with this memory device.
<b>@odata.id</b>	string	read-only	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.



Property	Type	Attributes	Notes
}]			
<b>Processors@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
}			
<b>Location</b> (v1.4+) {}	object		The location of the memory device. See the <i>Resource</i> schema for details on this property.
<b>LocationIndicatorActive</b> (v1.10+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource.
<b>Log</b> (v1.13+) {}	object		The link to the log service associated with this memory. See the <i>LogService</i> schema for details on this property.
<b>LogicalSizeMiB</b> (v1.4+)	integer (mebibytes)	<i>read-only</i> (null)	Total size of the logical memory in MiB.
<b>Manufacturer</b>	string	<i>read-only</i> (null)	The memory device manufacturer.
<b>MaxTDPMilliWatts</b> [ ]	array (milliWatts) (integer)	<i>read-only</i>	Set of maximum power budgets supported by the memory device in milliwatts.
<b>Measurements</b> (v1.11+, deprecated v1.14 [ { } ])	array (object)		An array of DSP0274-defined measurement blocks. See the <i>SoftwareInventory</i> schema for details on this property. <i>Deprecated in v1.14 and later. This property has been deprecated in favor of the ComponentIntegrity resource.</i>
<b>MemoryDeviceType</b>	string (enum)	<i>read-only</i> (null)	Type details of the memory device. <i>For the possible property values, see MemoryDeviceType in Property details.</i>
<b>MemoryLocation</b> {	object		Memory connection information to sockets and memory controllers.
<b>Channel</b>	integer	<i>read-only</i> (null)	The channel number to which the memory device is connected.
<b>MemoryController</b>	integer	<i>read-only</i> (null)	The memory controller number to which the memory device is connected.
<b>Slot</b>	integer	<i>read-only</i> (null)	The slot number to which the memory device is connected.
<b>Socket</b>	integer	<i>read-only</i> (null)	The socket number to which the memory device is connected.
}			

Property	Type	Attributes	Notes
<b>MemoryMedia</b> [ ]	array (string (enum))	<i>read-only</i>	Media of this memory device. <i>For the possible property values, see MemoryMedia in Property details.</i>
<b>MemoryMediaSources</b> (v1.15+) [ {	array		An array of memory chunks providing media for this memory.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a MemoryChunks resource. See the Links section and the <i>MemoryChunks</i> schema for details.
}]			
<b>MemorySubsystemControllerManufacturerID</b> (v1.3+)	string	<i>read-only (null)</i>	The manufacturer ID of the memory subsystem controller of this memory device.
<b>MemorySubsystemControllerProductID</b> (v1.3+)	string	<i>read-only (null)</i>	The product ID of the memory subsystem controller of this memory device.
<b>MemoryType</b>	string (enum)	<i>read-only (null)</i>	The type of memory device. <i>For the possible property values, see MemoryType in Property details.</i>
<b>Metrics</b> { }	object		The link to the metrics associated with this memory device. See the <i>MemoryMetrics</i> schema for details on this property.
<b>Model</b> (v1.11+)	string	<i>read-only (null)</i>	The product model number of this device.
<b>ModuleManufacturerID</b> (v1.3+)	string	<i>read-only (null)</i>	The manufacturer ID of this memory device.
<b>ModuleProductID</b> (v1.3+)	string	<i>read-only (null)</i>	The product ID of this memory device.
<b>NonVolatileSizeMiB</b> (v1.4+)	integer (mebibytes)	<i>read-only (null)</i>	Total size of the non-volatile portion memory in MiB.
<b>OperatingMemoryModes</b> [ ]	array (string (enum))	<i>read-only</i>	Memory modes supported by the memory device. <i>For the possible property values, see OperatingMemoryModes in Property details.</i>
<b>OperatingSpeedMhz</b>	integer (MHz)	<i>read-only (null)</i>	Operating speed of the memory device in MHz or MT/s as appropriate.
<b>OperatingSpeedRangeMHz</b> (v1.13+) {	object (excerpt)		Range of allowed operating speeds (MHz). This object is an excerpt of the <a href="http://redfish.dmtf.org/schemas/v1/Control.json">http://redfish.dmtf.org/schemas/v1/Control.json</a> resource located at the URI shown in DataSourceUri.
<b>ControlMode</b>	string (enum)	<i>read-write (null)</i>	The current operating mode of the control. <i>For the possible property values, see ControlMode in Property details.</i>
}			

Property	Type	Attributes	Notes
<b>PartNumber</b>	string	<i>read-only (null)</i>	The product part number of this device.
<b>PersistentRegionNumberLimit</b> (v1.2+)	integer	<i>read-only (null)</i>	Total number of persistent regions this memory device can support.
<b>PersistentRegionSizeLimitMiB</b>	integer (mebibytes)	<i>read-only (null)</i>	Total size of persistent regions in mebibytes (MiB).
<b>PersistentRegionSizeMaxMiB</b> (v1.2+)	integer (mebibytes)	<i>read-only (null)</i>	Maximum size of a single persistent region in mebibytes (MiB).
<b>PowerManagementPolicy</b> {	object		Power management policy information.
<b>AveragePowerBudgetMilliWatts</b>	integer (milliWatts)	<i>read-only (null)</i>	Average power budget, in milliwatts.
<b>MaxTDPMilliWatts</b>	integer (milliWatts)	<i>read-only (null)</i>	Maximum TDP in milliwatts.
<b>PeakPowerBudgetMilliWatts</b>	integer (milliWatts)	<i>read-only (null)</i>	Peak power budget, in milliwatts.
<b>PolicyEnabled</b>	boolean	<i>read-only (null)</i>	An indication of whether the power management policy is enabled.
}			
<b>RankCount</b>	integer	<i>read-only (null)</i>	Number of ranks available in the memory device.
<b>Regions</b> [ {	array		Memory regions information within the memory device.
<b>MemoryClassification</b>	string (enum)	<i>read-only (null)</i>	The classification of memory that the memory region occupies. <i>For the possible property values, see MemoryClassification in Property details.</i>
<b>OffsetMiB</b>	integer (mebibytes)	<i>read-only (null)</i>	Offset within the memory that corresponds to the start of this memory region in mebibytes (MiB).
<b>PassphraseEnabled</b> (v1.5+)	boolean	<i>read-only (null)</i>	An indication of whether the passphrase is enabled for this region.
<b>PassphraseState</b> (deprecated v1.5)	boolean	<i>read-only (null)</i>	An indication of whether the state of the passphrase for this region is enabled. <i>Deprecated in v1.5 and later. This property has been deprecated in favor of PassphraseEnabled found within RegionSet.</i>
<b>RegionId</b>	string	<i>read-only (null)</i>	Unique region ID representing a specific region within the memory device.

Property	Type	Attributes	Notes
<b>SizeMiB</b>	integer (mebibytes)	<i>read-only</i> ( <i>null</i> )	Size of this memory region in mebibytes (MiB).
}]			
<b>SecurityCapabilities {</b>	object		Security capabilities of the memory device.
<b>ConfigurationLockCapable</b> (v1.7+)	boolean	<i>read-only</i> ( <i>null</i> )	An indication of whether this memory device supports the locking, or freezing, of the configuration.
<b>DataLockCapable</b> (v1.7+)	boolean	<i>read-only</i> ( <i>null</i> )	An indication of whether this memory device supports data locking.
<b>MaxPassphraseCount</b>	integer	<i>read-only</i> ( <i>null</i> )	Maximum number of passphrases supported for this memory device.
<b>PassphraseCapable</b>	boolean	<i>read-only</i> ( <i>null</i> )	An indication of whether the memory device is passphrase capable.
<b>PassphraseLockLimit</b> (v1.7+)	integer	<i>read-only</i> ( <i>null</i> )	The maximum number of incorrect passphrase attempts allowed before memory device is locked.
<b>SecurityStates</b> (deprecated v1.7) []	array (string (enum))	<i>read-only</i>	Security states supported by the memory device. <i>For the possible property values, see SecurityStates in Property details. Deprecated in v1.7 and later. This property has been deprecated in favor of using the individual PassphraseCapable, DataLockCapable and ConfigurationLockCapable properties.</i>
}			
<b>SecurityState</b> (v1.7+)	string (enum)	<i>read-write</i> ( <i>null</i> )	The current security state of this memory device. <i>For the possible property values, see SecurityState in Property details.</i>
<b>SerialNumber</b>	string	<i>read-only</i> ( <i>null</i> )	The product serial number of this device.
<b>SpareDeviceCount</b>	integer	<i>read-only</i> ( <i>null</i> )	Number of unused spare devices available in the memory device.
<b>SparePartNumber</b> (v1.11+)	string	<i>read-only</i> ( <i>null</i> )	The spare part number of the memory.
<b>Status</b> (v1.1+) {}	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.
<b>SubsystemDeviceID</b> (deprecated v1.3)	string	<i>read-only</i> ( <i>null</i> )	Subsystem device ID. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of MemorySubsystemControllerProductID.</i>

Property	Type	Attributes	Notes
<b>SubsystemVendorID</b> ( <i>deprecated v1.3</i> )	string	<i>read-only (null)</i>	SubSystem vendor ID. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of MemorySubsystemControllerManufacturerID.</i>
<b>VendorID</b> ( <i>deprecated v1.3</i> )	string	<i>read-only (null)</i>	Vendor ID. <i>Deprecated in v1.3 and later. This property has been deprecated in favor of ModuleManufacturerID.</i>
<b>VolatileRegionNumberLimit</b> ( <i>v1.2+</i> )	integer	<i>read-only (null)</i>	Total number of volatile regions this memory device can support.
<b>VolatileRegionSizeLimitMiB</b>	integer (mebibytes)	<i>read-only (null)</i>	Total size of volatile regions in mebibytes (MiB).
<b>VolatileRegionSizeMaxMiB</b> ( <i>v1.2+</i> )	integer (mebibytes)	<i>read-only (null)</i>	Maximum size of a single volatile region in mebibytes (MiB).
<b>VolatileSizeMiB</b> ( <i>v1.4+</i> )	integer (mebibytes)	<i>read-only (null)</i>	Total size of the volatile portion memory in MiB.

## 2.5.4 Actions

### 2.5.4.1 DisablePassphrase

#### Description

Disable passphrase for given regions.

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

#### Action parameters

Parameter Name	Type	Attributes	Notes
<b>Passphrase</b>	string	<i>required</i>	Passphrase for doing the operation.
<b>RegionId</b>	string	<i>required</i>	The memory region ID to which to apply this action.

#### Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

#### 2.5.4.2 OverwriteUnit (v1.6+)

##### Description

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

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

##### Action parameters

Parameter Name	Type	Attributes	Notes
<b>Passphrase</b>	string	<i>required</i>	Passphrase for doing the operation.
<b>RegionId</b>	string	<i>required</i>	The memory region ID to which to apply this action.

##### Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

#### 2.5.4.3 Reset (v1.8+)

##### Description

This action resets this memory device.

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

##### Action parameters

Parameter Name	Type	Attributes	Notes
<b>ResetType</b>	string (enum)	<i>optional</i>	The type of reset. <i>For the possible property values, see ResetType in Property details.</i>

##### Request Example

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

#### 2.5.4.4 SecureEraseUnit

##### Description

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

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

##### Action parameters

Parameter Name	Type	Attributes	Notes
<b>Passphrase</b>	string	<i>required</i>	Passphrase for doing the operation.
<b>RegionId</b>	string	<i>required</i>	The memory region ID to which to apply this action.

##### Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

#### 2.5.4.5 SetPassphrase

##### Description

Set passphrase for the given regions.

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

##### Action parameters

Parameter Name	Type	Attributes	Notes
<b>Passphrase</b>	string	<i>required</i>	Passphrase for doing the operation.

Parameter Name	Type	Attributes	Notes
<b>RegionId</b>	string	<i>required</i>	The memory region ID to which to apply this action.

### Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

#### 2.5.4.6 UnlockUnit

##### Description

This contains the action for unlocking given regions.

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

##### Action parameters

Parameter Name	Type	Attributes	Notes
<b>Passphrase</b>	string	<i>required</i>	The passphrase required to complete the operation.
<b>RegionId</b>	string	<i>required</i>	The memory region ID to which to apply this action.

### Request Example

```
{
  "Passphrase": "FluffyBunny",
  "RegionId": 2
}
```

## 2.5.5 Property details

### 2.5.5.1 BaseModuleType:

The base module type of the memory device.



string	Description
Die (v1.7+)	A die within a package.
LRDIMM	Load Reduced.
Mini_RDIMM	Mini_RDIMM.
Mini_UDIMM	Mini_UDIMM.
RDIMM	Registered DIMM.
SO_DIMM	SO_DIMM.
SO_DIMM_16b	SO_DIMM_16b.
SO_DIMM_32b	SO_DIMM_32b.
SO_RDIMM_72b	SO_RDIMM_72b.
SO_UDIMM_72b	SO_UDIMM_72b.
UDIMM	UDIMM.

#### 2.5.5.2 ControlMode:

The current operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

#### 2.5.5.3 ErrorCorrection:

Error correction scheme supported for this memory device.

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

**2.5.5.4 MemoryClassification:**

The classification of memory that the memory region occupies.

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

**2.5.5.5 MemoryDeviceType:**

Type details of the memory device.

string	Description
DDR	DDR.
DDR2	DDR2.
DDR2_SDRAM	DDR2 SDRAM.
DDR2_SDRAM_FB_DIMM	DDR2 SDRAM FB_DIMM.
DDR2_SDRAM_FB_DIMM_PROBE	DDR2 SDRAM FB_DIMM PROBE.
DDR3	DDR3.
DDR3_SDRAM	DDR3 SDRAM.
DDR4	DDR4.
DDR4_SDRAM	DDR4 SDRAM.
DDR4E_SDRAM	DDR4E SDRAM.
DDR5 (v1.11+)	Double data rate type five synchronous dynamic random-access memory.
DDR_SDRAM	DDR SDRAM.
DDR_SGRAM	DDR SGRAM.
EDO	EDO.
FastPageMode	Fast Page Mode.
GDDR (v1.11+)	Synchronous graphics random-access memory.
GDDR2 (v1.11+)	Double data rate type two synchronous graphics random-access memory.

string	Description
GDDR3 (v1.11+)	Double data rate type three synchronous graphics random-access memory.
GDDR4 (v1.11+)	Double data rate type four synchronous graphics random-access memory.
GDDR5 (v1.11+)	Double data rate type five synchronous graphics random-access memory.
GDDR5X (v1.11+)	Double data rate type five X synchronous graphics random-access memory.
GDDR6 (v1.11+)	Double data rate type six synchronous graphics random-access memory.
HBM (v1.7+)	High Bandwidth Memory.
HBM2 (v1.7+)	The second generation of High Bandwidth Memory.
HBM3 (v1.11+)	The third generation of High Bandwidth Memory.
Logical (v1.4+)	Logical Non-volatile device.
LPDDR3_SDRAM	LPDDR3 SDRAM.
LPDDR4_SDRAM	LPDDR4 SDRAM.
OEM (v1.11+)	OEM-defined.
PipelinedNibble	Pipelined Nibble.
ROM	ROM.
SDRAM	SDRAM.

### 2.5.5.6 MemoryMedia:

Media of this memory device.

string	Description
CXL	CXL Device memory region media.
DRAM	DRAM media.
Fabric	Remote memory media connected thru fabric.
Intel3DXPoint	Intel 3D XPoint media.
NAND	NAND media.
Proprietary	Proprietary media.

### 2.5.5.7 MemoryType:

The type of memory device.

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

### 2.5.5.8 OperatingMemoryModes:

Memory modes supported by the memory device.

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

### 2.5.5.9 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 system.
GracefulRestart	Shut down gracefully and restart the system.
GracefulShutdown	Shut down gracefully and power off.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system.
On	Turn on the unit.

string	Description
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 full 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.

#### 2.5.5.10 SecurityState:

The current security state of this memory device.

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

#### 2.5.5.11 SecurityStates:

Security states supported by the memory device.

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

string	Description
Unlocked	Secure mode is enabled and access to the data is unlocked.

## 2.5.6 Example response

```
{
  "@odata.type": "#Memory.v1_14_0.Memory",
  "Name": "Regular Memory",
  "Id": "1",
  "RankCount": 1,
  "MaxTDPMilliWatts": [
    12000
  ],
  "CapacityMiB": 8192,
  "DataWidthBits": 64,
  "BusWidthBits": 72,
  "ErrorCorrection": "MultiBitECC",
  "MemoryLocation": {
    "Socket": 1,
    "MemoryController": 1,
    "Channel": 1,
    "Slot": 1
  },
  "MemoryType": "DRAM",
  "MemoryDeviceType": "DDR4",
  "BaseModuleType": "RDIMM",
  "MemoryMedia": [
    "DRAM"
  ],
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "Metrics": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1/MemoryMetrics"
  },
  "EnvironmentMetrics": {
    "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1/EnvironmentMetrics"
  },
  "Location": {
    "PartLocation": {
      "ServiceLabel": "Socket 1_A",
      "LocationType": "Socket",
      "LocationOrdinalValue": 0
    }
  },
  "@odata.id": "/redfish/v1/Systems/437XR1138R2/Memory/1"
}
```

## 2.6 MemoryChunks 1.5.0

Version	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2021.	2020.3	2019.4	2017.3	2017.1	2016.2

### 2.6.1 Description

The schema definition of a memory chunk and its configuration.

### 2.6.2 URIs

/redfish/v1/Chassis/{ChassisId}/MemoryDomains/{MemoryDomainId}/MemoryChunks/{MemoryChunksId}  
 /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}/MemoryChunks/{MemoryChunksId}  
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}/MemoryChunks/{MemoryChunksId}  
 /redfish/v1/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}/MemoryChunks/{MemoryChunksId}

### 2.6.3 Properties

Property	Type	Attributes	Notes
<b>AddressRangeOffsetMiB</b> (v1.3+)	integer (mebibytes)	<i>read-only</i> (null)	Offset of the memory chunk in the address range in MiB.
<b>AddressRangeType</b>	string (enum)	<i>read-only</i> (null)	Memory type of this memory chunk. <i>For the possible property values, see AddressRangeType in Property details.</i>
<b>DisplayName</b> (v1.4+)	string	<i>read-write</i> (null)	A user-configurable string to name the memory chunk.
<b>InterleaveSets</b> [ {	array		The interleave sets for the memory chunk.
<b>Memory</b> {	object		Describes a memory device of the interleave set.
<b>@odata.id</b>	string (URI)	<i>read-only</i>	The unique identifier for a resource.
}			
<b>MemoryLevel</b>	integer	<i>read-only</i> (null)	Level of the interleave set for multi-level tiered memory.

Property	Type	Attributes	Notes
<b>OffsetMiB</b>	integer (mebibytes)	<i>read-only</i> (null)	Offset within the DIMM that corresponds to the start of this memory region, measured in mebibytes (MiB).
<b>RegionId</b>	string	<i>read-only</i> (null)	DIMM region identifier.
<b>SizeMiB</b>	integer (mebibytes)	<i>read-only</i> (null)	Size of this memory region measured in mebibytes (MiB).
}]			
<b>IsMirrorEnabled</b>	boolean	<i>read-only</i> (null)	An indication of whether memory mirroring is enabled for this memory chunk.
<b>IsSpare</b>	boolean	<i>read-only</i> (null)	An indication of whether sparing is enabled for this memory chunk.
<b>Links</b> (v1.3+) {	object		The links to other resources that are related to this resource.
<b>CXLLogicalDevices</b> (v1.5+) [{	array		An array of links to the CXL Logical Device associated with this memory chunk.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a CXLLogicalDevice resource. See the Links section and the <i>CXLLogicalDevice</i> schema for details.
}]			
<b>CXLLogicalDevices@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Endpoints</b> (v1.3+) [{	array		An array of links to the endpoints that connect to this memory chunk.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
<b>Endpoints@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> ⚡	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
}			
<b>MediaLocation</b> (v1.5+)	string (enum)	<i>read-write</i> (null)	Location of memory media type of this memory chunk. <i>For the possible property values, see MediaLocation in Property details.</i>
<b>MemoryChunkSizeMiB</b>	integer (mebibytes)	<i>read-only</i> (null)	Size of the memory chunk measured in mebibytes (MiB).
<b>OperationalState</b> (v1.5+)	string (enum)	<i>read-write</i> (null)	Operational state of this memory chunk. <i>For the possible property values, see OperationalState in Property details.</i>



Property	Type	Attributes	Notes
<b>Status</b> (v1.2+) {}	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.

## 2.6.4 Property details

### 2.6.4.1 AddressRangeType:

Memory type of this memory chunk.

string	Description
Block	Block accessible memory.
PMEM	Byte accessible persistent memory.
Volatile	Volatile memory.

### 2.6.4.2 MediaLocation:

Location of memory media type of this memory chunk.

string	Description
Local	Memory chunk created using local media.
Mixed	Memory chunk created using local and remote media.
Remote	Memory chunk created using remote media accessible thru fabric.

### 2.6.4.3 OperationalState:

Operational state of this memory chunk.

string	Description
Offline	Memory chunk cannot be used.
Online	Memory chunk can be used.

## 2.6.5 Example response

```
{
  "@odata.type": "#MemoryChunks.v1_4_1.MemoryChunks",
  "Name": "Memory Chunk - Whole System",
  "Id": "1",
  "MemoryChunkSizeMiB": 32768,
  "AddressRangeType": "Volatile",
  "IsMirrorEnabled": false,
  "IsSpare": false,
  "InterleaveSets": [
    {
      "Memory": {
        "@odata.id": "/redfish/v1/Systems/2/Memory/1"
      }
    },
    {
      "Memory": {
        "@odata.id": "/redfish/v1/Systems/2/Memory/2"
      }
    },
    {
      "Memory": {
        "@odata.id": "/redfish/v1/Systems/2/Memory/3"
      }
    },
    {
      "Memory": {
        "@odata.id": "/redfish/v1/Systems/2/Memory/4"
      }
    }
  ],
  "@Redfish.Settings": {
    "@odata.type": "#Settings.v1_3_4.Settings",
    "SettingsObject": {
      "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1/MemoryChunks/1/SD"
    },
    "Time": "2012-03-07T14:44.30-05:00",
    "ETag": "someetag",
    "Messages": [
      {
        "MessageId": "Base.1.0.Success"
      }
    ]
  },
  "Oem": {},
  "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1/MemoryChunks/1"
}
```

## 2.7 MemoryDomain 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2021.	2019.4	2017.1	2016.3	2016.2

### 2.7.1 Description

The MemoryDomain schema describes a memory domain and its configuration. Memory domains indicate to the client which memory, or DIMMs, can be grouped together in memory chunks to represent addressable memory.

### 2.7.2 URIs

/redfish/v1/Chassis/{ChassisId}/MemoryDomains/{MemoryDomainId}  
 /redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}  
 /redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}  
 /redfish/v1/Systems/{ComputerSystemId}/MemoryDomains/{MemoryDomainId}

### 2.7.3 Properties

Property	Type	Attributes	Notes
<b>AllowsBlockProvisioning</b>	boolean	<i>read-only</i> (null)	An indication of whether this memory domain supports the provisioning of blocks of memory.
<b>AllowsMemoryChunkCreation</b>	boolean	<i>read-only</i> (null)	An indication of whether this memory domain supports the creation of memory chunks.
<b>AllowsMirroring</b> (v1.1+)	boolean	<i>read-only</i> (null)	An indication of whether this memory domain supports the creation of memory chunks with mirroring enabled.
<b>AllowsSparing</b> (v1.1+)	boolean	<i>read-only</i> (null)	An indication of whether this memory domain supports the creation of memory chunks with sparing enabled.
<b>InterleavableMemorySets</b> [ {	array		The interleave sets for the memory chunk.
<b>MemorySet</b> [ {	array		The set of memory for a particular interleave set.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Memory resource. See the Links section and the <i>Memory</i> schema for details.
}]			
<b>MemorySet@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.

Property	Type	Attributes	Notes
}]			
<b>Links</b> (v1.3+){	object		The links to other Resources that are related to this Resource.
<b>CXLLogicalDevices</b> (v1.4+)[{	array		An array of links to the CXL Logical Device associated with this memory domain.
@odata.id	string	read-only	Link to a CXLLogicalDevice resource. See the Links section and the <i>CXLLogicalDevice</i> schema for details.
}]			
<b>CXLLogicalDevices@odata.count</b>	integer	read-only	The number of items in a collection.
<b>FabricAdapters</b> (v1.4+)[{	array		An array of links to the fabric adapters for this memory domain.
@odata.id	string	read-only	Link to a FabricAdapter resource. See the Links section and the <i>FabricAdapter</i> schema for details.
}]			
<b>FabricAdapters@odata.count</b>	integer	read-only	The number of items in a collection.
<b>MediaControllers</b> (v1.3+)[{ }]	array (object)		An array of links to the media controllers for this memory domain. See the <i>MediaController</i> schema for details on this property.
<b>MediaControllers@odata.count</b>	integer	read-only	The number of items in a collection.
<b>Oem</b> {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PCleFunctions</b> (v1.4+)[{	array		An array of links to the PCIe function representing this memory domain.
@odata.id	string	read-only	Link to a PCIeFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			
<b>PCleFunctions@odata.count</b>	integer	read-only	The number of items in a collection.
}			
<b>MemoryChunkIncrementMiB</b> (v1.4+)	integer (mebibytes)	read-only (null)	Size of the memory chunk increase unit within this domain in mebibytes (MiB).
<b>MemoryChunks</b> {	object		The link to the collection of memory chunks associated with this memory domain. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>MemoryChunks</i> . See the <i>MemoryChunks</i> schema for details.
}			

Property	Type	Attributes	Notes
<b>MinMemoryChunkSizeMiB</b> (v1.4+)	integer (mebibytes)	<i>read-only</i> ( <i>null</i> )	Min size of the memory chunk allowed within this domain in mebibytes (MiB).
<b>Status</b> (v1.4+) {}	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.

## 2.7.4 Example response

```
{
  "@odata.type": "#MemoryDomain.v1_3_0.MemoryDomain",
  "Name": "Memory Domain - Whole System Mirroring Only",
  "Id": "1",
  "MemoryChunks": {
    "@odata.id": "/redfish/v1/Systems/4/MemoryDomains/1/MemoryChunks"
  },
  "AllowsMemoryChunkCreation": false,
  "AllowsBlockProvisioning": false,
  "InterleavableMemorySets": [
    {
      "MemorySet": [
        {
          "@odata.id": "/redfish/v1/Systems/2/Memory/1"
        },
        {
          "@odata.id": "/redfish/v1/Systems/2/Memory/2"
        },
        {
          "@odata.id": "/redfish/v1/Systems/2/Memory/3"
        },
        {
          "@odata.id": "/redfish/v1/Systems/2/Memory/4"
        }
      ]
    }
  ],
  "Oem": {},
  "@odata.id": "/redfish/v1/Systems/2/MemoryDomains/1"
}
```

## 2.8 PCIeDevice 1.10.0

Version	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2021.	2021.4	2021.3	2021.1	2020.4	2020.3	2019.2	2018.2	2017.3	2017.1	2016.2

## 2.8.1 Description

The PCIeDevice schema describes the properties of a PCIe device that is attached to a system.

## 2.8.2 URIs

```
/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/
{PCleDeviceId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}
/redfish/v1/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}
```

## 2.8.3 Properties

Property	Type	Attributes	Notes
<b>Assembly</b> (v1.2+) {}	object		The link to the assembly associated with this PCIe device. See the <i>Assembly</i> schema for details on this property.
<b>AssetTag</b>	string	<i>read-write</i> (null)	The user-assigned asset tag for this PCIe device.
<b>CXLDevice</b> (v1.10+) {	object	(null)	The CXL properties of this PCIe Device.
<b>CapableProtocolVersion</b> (v1.10+)	string (enum)	<i>read-only</i> (null)	The highest version of the CXL specification supported by this device. <i>For the possible property values, see CapableProtocolVersion in Property details.</i>
<b>CurrentProtocolVersion</b> (v1.10+)	string (enum)	<i>read-only</i> (null)	The version of the CXL specification in use by this device. <i>For the possible property values, see CurrentProtocolVersion in Property details.</i>
<b>DeviceType</b> (v1.10+)	string (enum)	<i>read-only</i> (null)	The CXL device type. <i>For the possible property values, see DeviceType in Property details.</i>
<b>MultiLogicalDevice</b> (v1.10+)	boolean	<i>read-only</i> (null)	An indication of whether this CXL device is the Multi Logical Device.
}			
<b>CXLLogicalDevices</b> (v1.10+) {	object		The link to the collection of CXL logical devices defined within this PCIe device. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>CXLLogicalDevice</i> . See the CXLLogicalDevice schema for details.
}			

Property	Type	Attributes	Notes
<b>DeviceType</b>	string (enum)	<i>read-only</i>	The device type for this PCIe device. <i>For the possible property values, see DeviceType in Property details.</i>
<b>EnvironmentMetrics</b> (v1.7+) {}	object		The link to the environment metrics for this PCIe device. See the <i>EnvironmentMetrics</i> schema for details on this property.
<b>FirmwareVersion</b>	string	<i>read-only</i> (null)	The version of firmware for this PCIe device.
<b>Links</b> {	object		The links to other resources that are related to this resource.
<b>Chassis</b> [ {	array		An array of links to the chassis in which the PCIe device is contained.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}]			
<b>Chassis@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PCleFunctions</b> (deprecated v1.4) [ {	array		An array of links to PCIe functions exposed by this device. <i>Deprecated in v1.4 and later. This property has been deprecated in favor of the PCleFunctions property in the root that provides a link to a resource collection.</i>
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCIeFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			
<b>PCleFunctions@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
}			
<b>Manufacturer</b>	string	<i>read-only</i> (null)	The manufacturer of this PCIe device.
<b>Model</b>	string	<i>read-only</i> (null)	The model number for the PCIe device.
<b>PartNumber</b>	string	<i>read-only</i> (null)	The part number for this PCIe device.
<b>PCleFunctions</b> (v1.4+) {	object		The link to the collection of PCIe functions associated with this PCIe device. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>PCleFunction</i> . See the <i>PCleFunction</i> schema for details.

Property	Type	Attributes	Notes
}			
<b>PCleInterface</b> (v1.3+) {	object		The PCIe interface details for this PCIe device.
<b>LanesInUse</b> (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes in use by this device.
<b>MaxLanes</b> (v1.3+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this device.
<b>MaxPCleType</b> (v1.3+)	string (enum)	<i>read-only</i> (null)	The highest version of the PCIe specification supported by this device. <i>For the possible property values, see MaxPCleType in Property details.</i>
<b>Oem</b> (v1.3+) {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PCleType</b> (v1.3+)	string (enum)	<i>read-only</i> (null)	The version of the PCIe specification in use by this device. <i>For the possible property values, see PCleType in Property details.</i>
}			
<b>ReadyToRemove</b> (v1.7+)	boolean	<i>read-write</i> (null)	An indication of whether the PCIe device is prepared by the system for removal.
<b>SerialNumber</b>	string	<i>read-only</i> (null)	The serial number for this PCIe device.
<b>SKU</b>	string	<i>read-only</i> (null)	The SKU for this PCIe device.
<b>Slot</b> (v1.9+) {	object	(null)	Information about the slot for this PCIe device.
<b>LaneSplitting</b> (v1.9+)	string (enum)	<i>read-only</i> (null)	The lane splitting strategy used in the PCIe slot. <i>For the possible property values, see LaneSplitting in Property details.</i>
<b>Lanes</b> (v1.9+)	integer	<i>read-only</i> (null)	The number of PCIe lanes supported by this slot.
<b>Location</b> (v1.9+) {}	object		The location of the PCIe slot. See the <i>Resource</i> schema for details on this property.
<b>PCleType</b> (v1.9+)	string (enum)	<i>read-only</i> (null)	The PCIe specification this slot supports. <i>For the possible property values, see PCleType in Property details.</i>
<b>SlotType</b> (v1.9+)	string (enum)	<i>read-only</i> (null)	The PCIe slot type. <i>For the possible property values, see SlotType in Property details.</i>
}			
<b>SparePartNumber</b> (v1.6+)	string	<i>read-only</i> (null)	The spare part number of the PCIe device.



Property	Type	Attributes	Notes
<b>Status</b> {}	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.
<b>UUID</b> (v1.5+)	string	<i>read-only</i> ( <i>null</i> )	The UUID for this PCIe device.

## 2.8.4 Property details

### 2.8.4.1 CapableProtocolVersion:

The highest version of the CXL specification supported by this device.

string	Description
V1_1	CXL protocol specification version 1.1.
V2_0	CXL protocol specification version 2.0.

### 2.8.4.2 CurrentProtocolVersion:

The version of the CXL specification in use by this device.

string	Description
V1_1	CXL protocol specification version 1.1.
V2_0	CXL protocol specification version 2.0.

### 2.8.4.3 DeviceType:

#### 2.8.4.3.1 In top level:

The device type for this PCIe device.

string	Description
MultiFunction	A multi-function PCIe device.
Simulated	A PCIe device that is not currently physically present, but is being simulated by the PCIe infrastructure.
SingleFunction	A single-function PCIe device.

**2.8.4.3.2 In CXLDevice:**

The CXL device type.

string	Description
Type1	A Type 1 CXL device.
Type2	A Type 2 CXL device.
Type3	A Type 3 CXL device.

**2.8.4.4 LaneSplitting:**

The lane splitting strategy used in the PCIe slot.

string	Description
Bifurcated	The slot is bifurcated to split the lanes with associated devices.
Bridged	The slot has a bridge to share the lanes with associated devices.
None	The slot has no lane splitting.

**2.8.4.5 MaxPCleType:**

The highest version of the PCIe specification supported by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

**2.8.4.6 PCIeType:**

The version of the PCIe specification in use by this device.

string	Description
Gen1	A PCIe v1.0 slot.
Gen2	A PCIe v2.0 slot.
Gen3	A PCIe v3.0 slot.
Gen4	A PCIe v4.0 slot.
Gen5	A PCIe v5.0 slot.

#### 2.8.4.7 SlotType:

The PCIe slot type.

string	Description
FullLength	Full-Length PCIe slot.
HalfLength	Half-Length PCIe slot.
LowProfile	Low-Profile or Slim PCIe slot.
M2	PCIe M.2 slot.
Mini	Mini PCIe slot.
OCP3Large	Open Compute Project 3.0 large form factor slot.
OCP3Small	Open Compute Project 3.0 small form factor slot.
OEM	An OEM-specific slot.
U2	U.2 / SFF-8639 slot or bay.

## 2.8.5 Example response

```
{
  "@odata.type": "#PCIeDevice.v1_9_0.PCIeDevice",
  "Id": "NIC",
  "Name": "Simple Two-Port NIC",
  "Description": "Simple Two-Port NIC PCIe Device",
  "AssetTag": "ORD-4302015-18432RS",
  "Manufacturer": "Contoso",
  "Model": "SuperNIC 2000",
  "SKU": "89587433",
  "SerialNumber": "2M220100SL",
  "PartNumber": "232-4598D7",
}
```

```

    "DeviceType": "MultiFunction",
    "FirmwareVersion": "12.342-343",
    "Status": {
      "State": "Enabled",
      "Health": "OK",
      "HealthRollup": "OK"
    },
    "PCIeInterface": {
      "PCIeType": "Gen2",
      "MaxPCIeType": "Gen3",
      "LanesInUse": 4,
      "MaxLanes": 4
    },
    "Links": {
      "Chassis": [
        {
          "@odata.id": "/redfish/v1/Chassis/1"
        }
      ],
      "PCIeFunctions": [
        {
          "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC/PCIeFunctions/1"
        },
        {
          "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC/PCIeFunctions/2"
        }
      ],
      "Oem": {}
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Systems/1/PCIeDevices/NIC"
  }

```

## 2.9 PCIeFunction 1.4.0

Version	v1.4	v1.3	v1.2	v1.1	v1.0
Release	2021.	2021.1	2018.1	2017.1	2016.2

### 2.9.1 Description

The schema definition for the PCIeFunction Resource. It represents the properties of a PCIeFunction attached to a System.

## 2.9.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/PCleDevices/{PCleDeviceId}/PCleFunctions/{PCleFunctionId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/
{PCleDeviceId}/PCleFunctions/{PCleFunctionId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/
PCleFunctions/{PCleFunctionId}
/redfish/v1/Systems/{ComputerSystemId}/PCleDevices/{PCleDeviceId}/PCleFunctions/{PCleFunctionId}

```

## 2.9.3 Properties

Property	Type	Attributes	Notes
<b>ClassCode</b>	string	<i>read-only</i> (null)	The Class Code of this PCIe function.
<b>DeviceClass</b>	string (enum)	<i>read-only</i>	The class for this PCIe function. <i>For the possible property values, see DeviceClass in Property details.</i>
<b>DeviceId</b>	string	<i>read-only</i> (null)	The Device ID of this PCIe function.
<b>Enabled</b> (v1.3+)	boolean	<i>read-write</i>	An indication of whether this PCIe device function is enabled.
<b>FunctionId</b>	integer	<i>read-only</i> (null)	The PCIe Function Number.
<b>FunctionProtocol</b> (v1.4+)	string (enum)	<i>read-only</i> (null)	The PCIe Function protocol. <i>For the possible property values, see FunctionProtocol in Property details.</i>
<b>FunctionType</b>	string (enum)	<i>read-only</i>	The type of the PCIe function. <i>For the possible property values, see FunctionType in Property details.</i>
<b>Links</b> {	object		The links to other Resources that are related to this Resource.
<b>CXLLogicalDevice</b> (v1.4+) {	object	(null)	The link to the CXL Logical Device which this function is assigned to. See the <i>CXLLogicalDevice</i> schema for details on this property.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a CXLLogicalDevice resource. See the Links section and the <i>CXLLogicalDevice</i> schema for details.
}			
<b>Drives</b> [ {} ]	array (object)		An array of links to the drives that the PCIe device produces. See the <i>Drive</i> schema for details on this property.
<b>Drives@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.

Property	Type	Attributes	Notes
<b>EthernetInterfaces</b> [{ }]	array (object)		An array of links to the Ethernet interfaces that the PCIe device produces. See the <i>EthernetInterface</i> schema for details on this property.
<b>EthernetInterfaces@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>MemoryControllers</b> (v1.4+) [{ }	array		An array of links to the memory controllers that the PCIe device produces.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a MemoryDomain resource. See the Links section and the <i>MemoryDomain</i> schema for details.
}]			
<b>MemoryControllers@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>NetworkDeviceFunctions</b> (v1.2+) [{ }]	array (object)		An array of links to the network device functions that the PCIe device produces. See the <i>NetworkDeviceFunction</i> schema for details on this property.
<b>NetworkDeviceFunctions@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PCleDevice</b> {	object		The link to the PCIe device on which this function resides. See the <i>PCleDevice</i> schema for details on this property.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCleDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
<b>Processors</b> (v1.4+) [{ }	array		An array of links to the processors that the PCIe device produces.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Processor resource. See the Links section and the <i>Processor</i> schema for details.
}]			
<b>Processors@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>StorageControllers</b> [{ }]	array (object)		An array of links to the storage controllers that the PCIe device produces. See the <i>Storage</i> schema for details on this property.
<b>StorageControllers@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
}			
<b>RevisionId</b>	string	<i>read-only</i> (null)	The Revision ID of this PCIe function.

Property	Type	Attributes	Notes
<b>Status</b> {}	object		The status and health of the Resource and its subordinate or dependent Resources. See the <i>Resource</i> schema for details on this property.
<b>SubsystemId</b>	string	<i>read-only</i> (null)	The Subsystem ID of this PCIe function.
<b>SubsystemVendorId</b>	string	<i>read-only</i> (null)	The Subsystem Vendor ID of this PCIe function.
<b>VendorId</b>	string	<i>read-only</i> (null)	The Vendor ID of this PCIe function.

## 2.9.4 Property details

### 2.9.4.1 DeviceClass:

The class for this PCIe function.

string	Description
Bridge	A bridge.
CommunicationController	A communication controller.
Coprocessor	A coprocessor.
DisplayController	A display controller.
DockingStation	A docking station.
EncryptionController	An encryption controller.
GenericSystemPeripheral	A generic system peripheral.
InputDeviceController	An input device controller.
IntelligentController	An intelligent controller.
MassStorageController	A mass storage controller.
MemoryController	A memory controller.
MultimediaController	A multimedia controller.
NetworkController	A network controller.
NonEssentialInstrumentation	A non-essential instrumentation.
Other	A other class. The function Device Class Id needs to be verified.

string	Description
ProcessingAccelerators	A processing accelerators.
Processor	A processor.
SatelliteCommunicationsController	A satellite communications controller.
SerialBusController	A serial bus controller.
SignalProcessingController	A signal processing controller.
UnassignedClass	An unassigned class.
UnclassifiedDevice	An unclassified device.
WirelessController	A wireless controller.

#### 2.9.4.2 FunctionProtocol:

The PCIe Function protocol.

string	Description
CXL	A PCIe function supporting CXL extensions.
PCIe	A standard PCIe function.

#### 2.9.4.3 FunctionType:

The type of the PCIe function.

string	Description
Physical	A physical PCIe function.
Virtual	A virtual PCIe function.

### 2.9.5 Example response

```
{
  "@odata.type": "#PCIeFunction.v1_3_0.PCIeFunction",
  "Id": "2",
  "Name": "FC Port 2",
  "Description": "FC Port 2",
  "FunctionId": 2,
  "FunctionType": "Physical",
```



```

    "DeviceClass": "NetworkController",
    "DeviceId": "0xABCD",
    "VendorId": "0xABCD",
    "ClassCode": "0x010802",
    "RevisionId": "0x00",
    "SubsystemId": "0xABCD",
    "SubsystemVendorId": "0xABCD",
    "Status": {
        "State": "Enabled",
        "Health": "OK",
        "HealthRollup": "OK"
    },
    "Links": {
        "PCIeDevice": {
            "@odata.id": "/redfish/v1/Chassis/1/NetworkAdapters/FC"
        }
    },
    "Oem": {},
    "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/FC/PCIeFunctions/2"
}

```

## 2.10 Port 1.7.0

Version	v1.7	v1.6	v1.5	v1.4	v1.3	v1.2	v1.1	v1.0
Release	WIP	2021.4	2021.2	2021.1	2020.3	2019.4	2017.3	2016.2

### 2.10.1 Description

The Port schema contains properties that describe a port of a switch, controller, chassis, or any other device that could be connected to another entity.

### 2.10.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}
/redfish/v1/Chassis/{ChassisId}/MediaControllers/{MediaControllerId}/Ports/{PortId}
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/
{StorageControllerId}/Ports/{PortId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}

```

```

/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/
{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Fabrics/{FabricId}/Switches/{SwitchId}/Ports/{PortId}
/redfish/v1/Managers/{ManagerId}/USBPorts/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/
{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/
{StorageControllerId}/Ports/{PortId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Storage/{StorageId}/
StorageControllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/FabricAdapters/{FabricAdapterId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/GraphicsControllers/{ControllerId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/Controllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/Storage/{StorageId}/StorageControllers/{StorageControllerId}/Ports/{PortId}
/redfish/v1/Systems/{ComputerSystemId}/USBControllers/{ControllerId}/Ports/{PortId}

```

### 2.10.3 Properties

Property	Type	Attributes	Notes
<b>ActiveWidth</b> (v1.2+)	integer	<i>read-only</i>	The number of active lanes for this interface.
<b>CapableProtocolVersions</b> (v1.4+) [ ]	array (string, null)	<i>read-only</i>	The protocol versions capable of being sent over this port.
<b>CurrentProtocolVersion</b> (v1.4+)	string	<i>read-only</i> (null)	The protocol version being sent over this port.
<b>CurrentSpeedGbps</b>	number (Gbit/s)	<i>read-only</i> (null)	The current speed of this port.
<b>Enabled</b> (v1.4+)	boolean	<i>read-write</i>	An indication of whether this port is enabled.
<b>EnvironmentMetrics</b> (v1.4+) {}	object		The link to the environment metrics for this port or any attached small form-factor pluggable (SFP) device. See the <i>EnvironmentMetrics</i> schema for details on this property.
<b>Ethernet</b> (v1.3+) {	object	(null)	Ethernet properties for this port.

Property	Type	Attributes	Notes
<b>AssociatedMACAddresses</b> (v1.4+) [ ]	array (string, null)	<i>read-only</i>	An array of configured MAC addresses that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses.
<b>EEEEnabled</b> (v1.5+)	boolean	<i>read-write</i> (null)	Indicates whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled on this port.
<b>FlowControlConfiguration</b> (v1.3+)	string (enum)	<i>read-write</i> (null)	The locally configured 802.3x flow control setting for this port. <i>For the possible property values, see FlowControlConfiguration in Property details.</i>
<b>FlowControlStatus</b> (v1.3+)	string (enum)	<i>read-only</i> (null)	The 802.3x flow control behavior negotiated with the link partner for this port. <i>For the possible property values, see FlowControlStatus in Property details.</i>
<b>LLDPEnabled</b> (v1.4+)	boolean	<i>read-write</i>	Enable/disable LLDP for this port.
<b>LLDPReceive</b> (v1.4+){	object	(null)	LLDP data being received on this link.
<b>ChassisId</b> (v1.4+)	string	<i>read-only</i> (null)	Link Layer Data Protocol (LLDP) chassis ID received from the remote partner across this link.
<b>ChassisIdSubtype</b> (v1.4+)	string (enum)	<i>read-only</i> (null)	The type of identifier used for the chassis ID received from the remote partner across this link. <i>For the possible property values, see ChassisIdSubtype in Property details.</i>
<b>ManagementAddressIPv4</b> (v1.4+)	string	<i>read-only</i> (null)	The IPv4 management address received from the remote partner across this link.
<b>ManagementAddressIPv6</b> (v1.4+)	string	<i>read-only</i> (null)	The IPv6 management address received from the remote partner across this link.
<b>ManagementAddressMAC</b> (v1.4+)	string	<i>read-only</i> (null)	The management MAC address received from the remote partner across this link.
<b>ManagementVlanId</b> (v1.4+)	integer	<i>read-only</i> (null)	The management VLAN ID received from the remote partner across this link.
<b>PortId</b> (v1.4+)	string	<i>read-only</i> (null)	A colon delimited string of hexadecimal octets identifying a port.
<b>PortIdSubtype</b> (v1.4+)	string (enum)	<i>read-only</i> (null)	The port ID subtype received from the remote partner across this link. <i>For the possible property values, see PortIdSubtype in Property details.</i>
}			
<b>LLDPTransmit</b> (v1.4+){	object	(null)	LLDP data being transmitted on this link.

Property	Type	Attributes	Notes
<b>ChassisId</b> (v1.4+)	string	<i>read-write</i> (null)	Link Layer Data Protocol (LLDP) chassis ID.
<b>ChassisIdSubtype</b> (v1.4+)	string (enum)	<i>read-write</i> (null)	The type of identifier used for the chassis ID. <i>For the possible property values, see ChassisIdSubtype in Property details.</i>
<b>ManagementAddressIPv4</b> (v1.4+)	string	<i>read-write</i> (null)	The IPv4 management address to be transmitted from this endpoint.
<b>ManagementAddressIPv6</b> (v1.4+)	string	<i>read-write</i> (null)	The IPv6 management address to be transmitted from this endpoint.
<b>ManagementAddressMAC</b> (v1.4+)	string	<i>read-write</i> (null)	The management MAC address to be transmitted from this endpoint.
<b>ManagementVlanId</b> (v1.4+)	integer	<i>read-write</i> (null)	The management VLAN ID to be transmitted from this endpoint.
<b>PortId</b> (v1.4+)	string	<i>read-write</i> (null)	A colon delimited string of hexadecimal octets identifying a port to be transmitted from this endpoint.
<b>PortIdSubtype</b> (v1.4+)	string (enum)	<i>read-write</i> (null)	The port ID subtype to be transmitted from this endpoint. <i>For the possible property values, see PortIdSubtype in Property details.</i>
}			
<b>SupportedEthernetCapabilities</b> (v1.3+, deprecated v1.5 [ ])	array (string (enum))	<i>read-only</i> (null)	The set of Ethernet capabilities that this port supports. <i>For the possible property values, see SupportedEthernetCapabilities in Property details. Deprecated in v1.5 and later. This property has been deprecated in favor of individual fields for the various properties.</i>
<b>WakeOnLANEnabled</b> (v1.5+)	boolean	<i>read-write</i> (null)	Indicates whether Wake on LAN (WoL) is enabled on this port.
}			
<b>FibreChannel</b> (v1.3+) {	object	(null)	Fibre Channel properties for this port.
<b>AssociatedWorldWideNames</b> (v1.4+) [ ]	array (string, null)	<i>read-only</i>	An array of configured World Wide Names (WWN) that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses.
<b>FabricName</b> (v1.3+)	string	<i>read-only</i> (null)	The Fibre Channel Fabric Name provided by the switch.
<b>NumberDiscoveredRemotePorts</b> (v1.3+)	integer	<i>read-only</i> (null)	The number of ports not on the associated device that the associated device has discovered through this port.

Property	Type	Attributes	Notes
<b>PortConnectionType</b> (v1.3+)	string (enum)	<i>read-only</i> (null)	The connection type of this port. <i>For the possible property values, see PortConnectionType in Property details.</i>
}			
<b>FunctionMaxBandwidth</b> (v1.4+)[{	array		An array of maximum bandwidth allocation percentages for the functions associated with this port.
<b>AllocationPercent</b> (v1.4+)	integer (%)	<i>read-write</i> (null)	The maximum bandwidth allocation percentage allocated to the corresponding network device function instance.
<b>NetworkDeviceFunction</b> (v1.4+) {}	object		The link to the network device function associated with this bandwidth setting of this network port. See the <i>NetworkDeviceFunction</i> schema for details on this property.
}]			
<b>FunctionMinBandwidth</b> (v1.4+)[{	array		An array of minimum bandwidth allocation percentages for the functions associated with this port.
<b>AllocationPercent</b> (v1.4+)	integer (%)	<i>read-write</i> (null)	The minimum bandwidth allocation percentage allocated to the corresponding network device function instance.
<b>NetworkDeviceFunction</b> (v1.4+) {}	object		The link to the network device function associated with this bandwidth setting of this network port. See the <i>NetworkDeviceFunction</i> schema for details on this property.
}]			
<b>GenZ</b> (v1.2+){	object		Gen-Z specific properties.
<b>LPRT</b> (v1.2+){	object		The Linear Packet Relay Table for the port. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>RouteEntry</i> . See the <i>RouteEntry</i> schema for details.
}			
<b>MPRT</b> (v1.2+){	object		the Multi-subnet Packet Relay Table for the port. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>RouteEntry</i> . See the <i>RouteEntry</i> schema for details.
}			
<b>VCAT</b> (v1.2+){	object		the Virtual Channel Action Table for the port. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>VCATEntry</i> . See the <i>VCATEntry</i> schema for details.

Property	Type	Attributes	Notes
}			
}			
<b>InfiniBand</b> (v1.6+){	object	(null)	InfiniBand properties for this port.
<b>AssociatedNodeGUIDs</b> (v1.6+) []	array (string, null)	read-only	An array of configured node GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses.
<b>AssociatedPortGUIDs</b> (v1.6+) []	array (string, null)	read-only	An array of configured port GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses.
<b>AssociatedSystemGUIDs</b> (v1.6+) []	array (string, null)	read-only	An array of configured system GUIDs that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses.
}			
<b>InterfaceEnabled</b> (v1.2+)	boolean	read-write (null)	An indication of whether the interface is enabled.
<b>LinkConfiguration</b> (v1.3+){ {	array		The link configuration of this port.
<b>AutoSpeedNegotiationCapable</b> (v1.3+)	boolean	read-only (null)	An indication of whether the port is capable of autonegotiating speed.
<b>AutoSpeedNegotiationEnabled</b> (v1.3+)	boolean	read-write (null)	Controls whether this port is configured to enable autonegotiating speed.
<b>CapableLinkSpeedGbps</b> (v1.3+) []	array (Gbit/s) (number, null)	read-only	The set of link speed capabilities of this port.
<b>ConfiguredNetworkLinks</b> (v1.3+){ {	array		The set of link speed and width pairs this port is configured to use for autonegotiation.
<b>ConfiguredLinkSpeedGbps</b> (v1.3+)	number (Gbit/s)	read-write (null)	The link speed per lane this port is configured to use for autonegotiation.
<b>ConfiguredWidth</b> (v1.3+)	integer	read-write (null)	The link width this port is configured to use for autonegotiation in conjunction with the link speed.

Property	Type	Attributes	Notes
}]			
}]			
<b>LinkNetworkTechnology</b> (v1.2+)	string (enum)	<i>read-only</i> (null)	The link network technology capabilities of this port. <i>For the possible property values, see LinkNetworkTechnology in Property details.</i>
<b>Links</b> {	object		The links to other resources that are related to this resource.
<b>AssociatedEndpoints</b> [ {	array		An array of links to the endpoints that connect through this port.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
<b>AssociatedEndpoints@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Cables</b> (v1.5+) [ { }	array (object)		An array of links to the cables connected to this port. See the <i>Cable</i> schema for details on this property.
<b>Cables@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>ConnectedPorts</b> (v1.2+) [ {	array		An array of links to the remote ports connected to this port.
<b>@odata.id</b>	string	<i>read-only</i>	Link to another Port resource.
}]			
<b>ConnectedPorts@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>ConnectedSwitchPorts</b> [ {	array		An array of links to the ports that connect to the switch through this port.
<b>@odata.id</b>	string	<i>read-only</i>	Link to another Port resource.
}]			
<b>ConnectedSwitchPorts@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>ConnectedSwitches</b> [ { }	array (object)		An array of links to the switches that connect to the device through this port. See the <i>Switch</i> schema for details on this property.
<b>ConnectedSwitches@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> { }	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
}			
<b>LinkState</b> (v1.2+)	string (enum)	<i>read-write</i>	The desired link state for this interface. <i>For the possible property values, see LinkState in Property details.</i>

Property	Type	Attributes	Notes
<b>LinkStatus</b> (v1.2+)	string (enum)	<i>read-only</i>	The link status for this interface. <i>For the possible property values, see LinkStatus in Property details.</i>
<b>LinkTransitionIndicator</b> (v1.2+)	integer	<i>read-write</i>	The number of link state transitions for this interface.
<b>Location</b> (v1.1+) {}	object		The location of the port. See the <i>Resource</i> schema for details on this property.
<b>LocationIndicatorActive</b> (v1.3+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource.
<b>MaxFrameSize</b> (v1.3+)	integer (bytes)	<i>read-only</i> (null)	The maximum frame size supported by the port.
<b>MaxSpeedGbps</b>	number (Gbit/s)	<i>read-only</i> (null)	The maximum speed of this port as currently configured.
<b>Metrics</b> (v1.2+) {}	object	(null)	The link to the metrics associated with this port. See the <i>PortMetrics</i> schema for details on this property.
<b>PortId</b>	string	<i>read-only</i> (null)	The label of this port on the physical package for this port.
<b>PortMedium</b> (v1.2+)	string (enum)	<i>read-only</i> (null)	The physical connection medium for this port. <i>For the possible property values, see PortMedium in Property details.</i>
<b>PortProtocol</b>	string (enum)	<i>read-only</i> (null)	The protocol being sent over this port. <i>For the possible property values, see PortProtocol in Property details.</i>
<b>PortType</b>	string (enum)	<i>read-only</i> (null)	The type of this port. <i>For the possible property values, see PortType in Property details.</i>
<b>RemotePortId</b> (v1.7+)	string	<i>read-only</i> (null)	An identifier of remote port which this port is connected to.
<b>SFP</b> (v1.4+) {	object	(null)	The small form-factor pluggable (SFP) device associated with this port.
<b>FiberConnectionType</b> (v1.4+)	string (enum)	<i>read-only</i> (null)	The type of fiber connection currently used by this SFP. <i>For the possible property values, see FiberConnectionType in Property details.</i>
<b>Manufacturer</b> (v1.4+)	string	<i>read-only</i> (null)	The manufacturer of this SFP.
<b>MediumType</b> (v1.4+)	string (enum)	<i>read-only</i> (null)	The medium type connected to this SFP. <i>For the possible property values, see MediumType in Property details.</i>
<b>PartNumber</b> (v1.4+)	string	<i>read-only</i> (null)	The part number for this SFP.



Property	Type	Attributes	Notes
<b>SerialNumber</b> (v1.4+)	string	<i>read-only (null)</i>	The serial number for this SFP.
<b>Status</b> (v1.4+) {}	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.
<b>SupportedSFPTypes</b> (v1.4+) [ ]	array (string (enum))	<i>read-only (null)</i>	The types of SFP devices that can be attached to this port. <i>For the possible property values, see SupportedSFPTypes in Property details.</i>
<b>Type</b> (v1.4+)	string (enum)	<i>read-only (null)</i>	The type of SFP device that is attached to this port. <i>For the possible property values, see Type in Property details.</i>
}			
<b>SignalDetected</b> (v1.2+)	boolean	<i>read-only (null)</i>	An indication of whether a signal is detected on this interface.
<b>Status</b> {}	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.
<b>Width</b>	integer	<i>read-only (null)</i>	The number of lanes, phys, or other physical transport links that this port contains.

## 2.10.4 Actions

### 2.10.4.1 Reset

#### Description

This action resets this port.

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

#### Action parameters

Parameter Name	Type	Attributes	Notes
<b>ResetType</b>	string (enum)	<i>optional</i>	The type of reset. <i>For the possible property values, see ResetType in Property details.</i>

#### Request Example

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

## 2.10.5 Property details

### 2.10.5.1 ChassisIdSubtype:

The type of identifier used for the chassis ID received from the remote partner across this link.

string	Description
AgentId	Agent circuit ID, based on the agent-local identifier of the circuit as defined in RFC3046.
ChassisComp	Chassis component, based in the value of entPhysicalAlias in RFC4133.
IfAlias	Interface alias, based on the ifAlias MIB object.
IfName	Interface name, based on the ifName MIB object.
LocalAssign	Locally assigned, based on a alpha-numeric value locally assigned.
MacAddr	MAC address, based on an agent detected unicast source address as defined in IEEE Std. 802.
NetworkAddr	Network address, based on an agent detected network address.
NotTransmitted	No data to be sent to/received from remote partner.
PortComp	Port component, based in the value of entPhysicalAlias in RFC4133.

### 2.10.5.2 FiberConnectionType:

The type of fiber connection currently used by this SFP.

string	Description
MultiMode	The connection is using multi mode operation.
SingleMode	The connection is using single mode operation.

### 2.10.5.3 FlowControlConfiguration:

The locally configured 802.3x flow control setting for this port.

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	IEEE 802.3x flow control may be initiated by the link partner.
TX	IEEE 802.3x flow control may be initiated by this station.
TX_RX	IEEE 802.3x flow control may be initiated by this station or the link partner.

#### 2.10.5.4 FlowControlStatus:

The 802.3x flow control behavior negotiated with the link partner for this port.

string	Description
None	No IEEE 802.3x flow control is enabled on this port.
RX	IEEE 802.3x flow control may be initiated by the link partner.
TX	IEEE 802.3x flow control may be initiated by this station.
TX_RX	IEEE 802.3x flow control may be initiated by this station or the link partner.

#### 2.10.5.5 LinkNetworkTechnology:

The link network technology capabilities of this port.

string	Description
Ethernet	The port is capable of connecting to an Ethernet network.
FibreChannel	The port is capable of connecting to a Fibre Channel network.
GenZ	The port is capable of connecting to a Gen-Z fabric.
InfiniBand	The port is capable of connecting to an InfiniBand network.
PCIe (v1.6+)	The port is capable of connecting to a PCIe and CXL fabric.

#### 2.10.5.6 LinkState:

The desired link state for this interface.

string	Description
Disabled	This link is disabled.

string	Description
Enabled	This link is enabled.

#### 2.10.5.7 LinkStatus:

The link status for this interface.

string	Description
LinkDown	The link on this interface is down.
LinkUp	This link on this interface is up.
NoLink	No physical link detected on this interface.
Starting	This link on this interface is starting. A physical link has been established, but the port is not able to transfer data.
Training	This physical link on this interface is training.

#### 2.10.5.8 MediumType:

The medium type connected to this SFP.

string	Description
Copper	The medium connected is copper.
FiberOptic	The medium connected is fiber optic.

#### 2.10.5.9 PortConnectionType:

The connection type of this port.

string	Description
DPort (v1.5+)	This port connection type is a diagnostic port.
EPort (v1.5+)	This port connection type is an extender fabric port.
EXPort (v1.5+)	This port connection type is an external fabric port.
ExtenderFabric	This port connection type is an extender fabric port.
FLPort (v1.5+)	This port connects in a fabric loop configuration.
FPort (v1.5+)	This port connection type is a fabric port.

string	Description
Generic	This port connection type is a generic fabric port.
GPort (v1.5+)	This port connection type is a generic fabric port.
NLPort (v1.5+)	This port connects in a node loop configuration.
NotConnected	This port is not connected.
NPort	This port connects through an N-Port to a switch.
NPPort (v1.5+)	This port connection type is a proxy N port for N-Port virtualization.
PointToPoint	This port connects in a Point-to-point configuration.
PrivateLoop	This port connects in a private loop configuration.
PublicLoop	This port connects in a public configuration.
TEPort (v1.5+)	This port connection type is an trunking extender fabric port.
UPort (v1.5+)	This port connection type is unassigned.

#### 2.10.5.10 PortIdSubtype:

The port ID subtype received from the remote partner across this link.

string	Description
AgentId	Agent circuit ID, based on the agent-local identifier of the circuit as defined in RFC3046.
ChassisComp	Chassis component, based in the value of entPhysicalAlias in RFC4133.
IfAlias	Interface alias, based on the ifAlias MIB object.
IfName	Interface name, based on the ifName MIB object.
LocalAssign	Locally assigned, based on a alpha-numeric value locally assigned.
MacAddr	MAC address, based on an agent detected unicast source address as defined in IEEE Std. 802.
NetworkAddr	Network address, based on an agent detected network address.
NotTransmitted	No data to be sent to/received from remote partner.
PortComp	Port component, based in the value of entPhysicalAlias in RFC4133.

#### 2.10.5.11 PortMedium:

The physical connection medium for this port.

string	Description
Electrical	This port has an electrical cable connection.
Optical	This port has an optical cable connection.

#### 2.10.5.12 PortProtocol:

The protocol being sent over this port.

string	Description
AHCI	Advanced Host Controller Interface (AHCI).
CXL	Compute Express Link.
DisplayPort	DisplayPort.
DVI	DVI.
Ethernet	Ethernet.
FC	Fibre Channel.
FCoE	Fibre Channel over Ethernet (FCoE).
FCP	Fibre Channel Protocol for SCSI.
FICON	Fibre CONnection (FICON).
FTP	File Transfer Protocol (FTP).
GenZ	GenZ.
HDMI	HDMI.
HTTP	Hypertext Transport Protocol (HTTP).
HTTPS	Hypertext Transfer Protocol Secure (HTTPS).
I2C	Inter-Integrated Circuit Bus.
InfiniBand	InfiniBand.
iSCSI	Internet SCSI.
iWARP	Internet Wide Area RDMA Protocol (iWARP).
MultiProtocol	Multiple Protocols.
NFSv3	Network File System (NFS) version 3.
NFSv4	Network File System (NFS) version 4.

string	Description
NVLink	NVLink.
NVMe	Non-Volatile Memory Express (NVMe).
NVMeOverFabrics	NVMe over Fabrics.
OEM	OEM-specific.
PCIe	PCI Express.
RoCE	RDMA over Converged Ethernet Protocol.
RoCEv2	RDMA over Converged Ethernet Protocol Version 2.
SAS	Serial Attached SCSI.
SATA	Serial AT Attachment.
SFTP	SSH File Transfer Protocol (SFTP).
SMB	Server Message Block (SMB). Also known as the Common Internet File System (CIFS).
TCP	Transmission Control Protocol (TCP).
TFTP	Trivial File Transfer Protocol (TFTP).
UDP	User Datagram Protocol (UDP).
UHCI	Universal Host Controller Interface (UHCI).
USB	Universal Serial Bus (USB).
VGA	VGA.

### 2.10.5.13 PortType:

The type of this port.

string	Description
BidirectionalPort	This port connects to any type of device.
DownstreamPort	This port connects to a target device.
InterswitchPort	This port connects to another switch.
ManagementPort	This port connects to a switch manager.
UnconfiguredPort	This port has not yet been configured.
UpstreamPort	This port connects to a host device.

**2.10.5.14 ResetType:**

The type of reset.

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

**2.10.5.15 SupportedEthernetCapabilities:**

The set of Ethernet capabilities that this port supports.

string	Description
EEE	IEEE 802.3az Energy-Efficient Ethernet (EEE) is supported on this port.
WakeOnLAN	Wake on LAN (WoL) is supported on this port.

**2.10.5.16 SupportedSFPTypes:**

The types of SFP devices that can be attached to this port.



string	Description
cSFP	The SFP conforms to the CSFP MSA Specification.
MiniSASHD	The SFP conforms to the SFF Specification SFF-8644.
QSFP	The SFP conforms to the SFF Specification for QSFP.
QSFP14	The SFP conforms to the SFF Specification for QSFP14.
QSFP28	The SFP conforms to the SFF Specification for QSFP28.
QSFP56	The SFP conforms to the SFF Specification for QSFP56.
QSFPPlus	The SFP conforms to the SFF Specification for QSFP+.
SFP	The SFP conforms to the SFF Specification for SFP.
SFP28	The SFP conforms to the SFF Specification for SFP+ and IEEE 802.3by Specification.
SFPDD	The SFP conforms to the SFP-DD MSA Specification.
SFPPlus	The SFP conforms to the SFF Specification for SFP+.

#### 2.10.5.17 Type:

The type of SFP device that is attached to this port.

string	Description
cSFP	The SFP conforms to the CSFP MSA Specification.
MiniSASHD	The SFP conforms to the SFF Specification SFF-8644.
QSFP	The SFP conforms to the SFF Specification for QSFP.
QSFP14	The SFP conforms to the SFF Specification for QSFP14.
QSFP28	The SFP conforms to the SFF Specification for QSFP28.
QSFP56	The SFP conforms to the SFF Specification for QSFP56.
QSFPPlus	The SFP conforms to the SFF Specification for QSFP+.
SFP	The SFP conforms to the SFF Specification for SFP.
SFP28	The SFP conforms to the SFF Specification for SFP+ and IEEE 802.3by Specification.
SFPDD	The SFP conforms to the SFP-DD MSA Specification.
SFPPlus	The SFP conforms to the SFF Specification for SFP+.

## 2.10.6 Example response

```
{
  "@odata.type": "#Port.v1_6_0.Port",
  "Id": "1",
  "Name": "SAS Port 1",
  "Description": "SAS Port 1",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "PortId": "1",
  "PortProtocol": "SAS",
  "PortType": "BidirectionalPort",
  "CurrentSpeedGbps": 48,
  "Width": 4,
  "MaxSpeedGbps": 48,
  "Actions": {
    "Oem": {}
  },
  "Links": {
    "AssociatedEndpoints": [
      {
        "@odata.id": "/redfish/v1/Fabrics/SAS/Endpoints/Initiator1"
      }
    ]
  },
  "Oem": {},
  "@odata.id": "/redfish/v1/Fabrics/SAS/Switches/Switch1/Ports/1"
}
```

## 2.11 Processor 1.15.0

Version	v1.15	v1.14	v1.13	v1.12	v1.11	v1.10	v1.9	v1.8	v1.7	v1.6	v1.5	...
Release	2021.	2021.4	2021.2	2021.1	2020.4	2020.3	2020.2	2020.1	2019.4	2019.3	2019.1	...

### 2.11.1 Description

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

### 2.11.2 URIs

```

/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}
/redfish/v1/Chassis/{ChassisId}/NetworkAdapters/{NetworkAdapterId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}
/redfish/v1/Chassis/{ChassisId}/Processors/{ProcessorId}
/redfish/v1/Chassis/{ChassisId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/
{ProcessorId2}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}
/redfish/v1/CompositionService/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/
{ProcessorId}/SubProcessors/{ProcessorId2}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}
/redfish/v1/ResourceBlocks/{ResourceBlockId}/Systems/{ComputerSystemId}/Processors/{ProcessorId}/
SubProcessors/{ProcessorId2}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}
/redfish/v1/Systems/{ComputerSystemId}/Processors/{ProcessorId}/SubProcessors/{ProcessorId2}

```

### 2.11.3 Properties

Property	Type	Attributes	Notes
<b>AccelerationFunctions</b> (v1.4+) {	object		The link to the collection of acceleration functions associated with this processor. Contains a link to a resource.
@odata.id	string	read-only	Link to Collection of <i>AccelerationFunction</i> . See the <i>AccelerationFunction</i> schema for details.
}			
<b>AppliedOperatingConfig</b> (v1.9+) {}	object		The link to the operating configuration that is applied to this processor. See the <i>OperatingConfig</i> schema for details on this property.
<b>Assembly</b> (v1.2+) {}	object		The link to an assembly associated with this processor. See the <i>Assembly</i> schema for details on this property.
<b>BaseSpeedMHz</b> (v1.10+)	integer (MHz)	read-only (null)	The base (nominal) clock speed of the processor in MHz.

Property	Type	Attributes	Notes
<b>BaseSpeedPriorityState</b> (v1.9+)	string (enum)	<i>read-only</i> (null)	The state of the base frequency settings of the operation configuration applied to this processor. <i>For the possible property values, see BaseSpeedPriorityState in Property details.</i>
<b>Certificates</b> (v1.11+){	object		The link to a collection of certificates for device identity and attestation. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Certificate</i> . See the Certificate schema for details.
}			
<b>Enabled</b> (v1.12+)	boolean	<i>read-write</i>	An indication of whether this processor is enabled.
<b>EnvironmentMetrics</b> (v1.11+){}	object		The link to the environment metrics for this processor. See the <i>EnvironmentMetrics</i> schema for details on this property.
<b>FirmwareVersion</b> (v1.7+)	string	<i>read-only</i>	The firmware version of the processor.
<b>FPGA</b> (v1.4+){	object		The properties for processors of the FPGA type.
<b>ExternalInterfaces</b> (v1.4+)[{	array		An array of the FPGA external interfaces.
<b>Ethernet</b> (v1.4+){	object		The Ethernet-related information for this interface.
<b>MaxLanes</b> (v1.4+)	integer	<i>read-only</i> (null)	The number of lanes supported by this interface.
<b>MaxSpeedMbps</b> (v1.4+)	integer (Mbit/s)	<i>read-only</i> (null)	The maximum speed supported by this interface.
<b>Oem</b> (v1.4+){}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
}			
<b>InterfaceType</b> (v1.4+)	string (enum)	<i>read-only</i> (null)	The interface type. <i>For the possible property values, see InterfaceType in Property details.</i>
<b>PCIe</b> (v1.4+){	object		The PCIe-related information for this interface. See the <i>PCIeDevice</i> schema for details on this property.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCIeInterface resource. See the Links section and the <i>PCIeDevice</i> schema for details.
}			
}]			
<b>FirmwareId</b> (v1.4+)	string	<i>read-only</i>	The FPGA firmware identifier.
<b>FirmwareManufacturer</b> (v1.4+)	string	<i>read-only</i>	The FPGA firmware manufacturer.

Property	Type	Attributes	Notes
<b>FirmwareVersion</b> (v1.4+, deprecated v1.9)	string	read-only	The FPGA firmware version. <i>Deprecated in v1.9 and later. This property has been deprecated in favor of the FirmwareVersion property in the root of this resource.</i>
<b>FpgaType</b> (v1.4+)	string (enum)	read-only	The FPGA type. <i>For the possible property values, see FpgaType in Property details.</i>
<b>HostInterface</b> (v1.4+, deprecated v1.8 {	object		The FPGA interface to the host. <i>Deprecated in v1.8 and later. This property has been deprecated in favor of the SystemInterface property in the root of this resource.</i>
<b>Ethernet</b> (v1.4+) {	object		The Ethernet-related information for this interface.
<b>MaxLanes</b> (v1.4+)	integer	read-only (null)	The number of lanes supported by this interface.
<b>MaxSpeedMbps</b> (v1.4+)	integer (Mbit/s)	read-only (null)	The maximum speed supported by this interface.
<b>Oem</b> (v1.4+) { }	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
}			
<b>InterfaceType</b> (v1.4+)	string (enum)	read-only (null)	The interface type. <i>For the possible property values, see InterfaceType in Property details.</i>
<b>PCle</b> (v1.4+) {	object		The PCIe-related information for this interface. See the <i>PCleDevice</i> schema for details on this property.
<b>@odata.id</b>	string	read-only	Link to a PCIeInterface resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
}			
<b>Model</b> (v1.4+)	string	read-only	The FPGA model.
<b>Oem</b> (v1.4+) { }	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PCleVirtualFunctions</b> (v1.4+)	integer	read-write	The number of the PCIe Virtual Functions.
<b>ProgrammableFromHost</b> (v1.4+)	boolean	read-write (null)	An indication of whether the FPGA firmware can be reprogrammed from the host by using system software.
<b>ReconfigurationSlots</b> (v1.4+) [ {	array		An array of the FPGA reconfiguration slots. An FPGA uses a reconfiguration slot to contain an acceleration function that can change as the FPGA is provisioned.

Property	Type	Attributes	Notes
<b>AccelerationFunction</b> (v1.4+) {}	object		The link to the acceleration function that the code programmed into a reconfiguration slot provides. See the <i>AccelerationFunction</i> schema for details on this property.
<b>ProgrammableFromHost</b> (v1.4+)	boolean	<i>read-write</i> (null)	An indication of whether the reconfiguration slot can be reprogrammed from the host by using system software.
<b>SlotId</b> (v1.4+)	string	<i>read-only</i> (null)	The FPGA reconfiguration slot identifier.
<b>UUID</b> (v1.4+)	string	<i>read-only</i> (null)	The UUID for this reconfiguration slot.
}]			
}			
<b>HighSpeedCoreIds</b> (v1.9+) []	array (integer, null)	<i>read-only</i>	The list of core identifiers corresponding to the cores that have been configured with the higher clock speed from the operating configuration applied to this processor.
<b>InstructionSet</b>	string (enum)	<i>read-only</i> (null)	The instruction set of the processor. <i>For the possible property values, see InstructionSet in Property details.</i>
<b>Links</b> (v1.1+) {	object		The links to other resources that are related to this resource.
<b>Chassis</b> (v1.1+) {	object		The link to the chassis that contains this processor. See the <i>Chassis</i> schema for details on this property.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Chassis resource. See the Links section and the <i>Chassis</i> schema for details.
}			
<b>ConnectedProcessors</b> (v1.4+) [{	array		An array of links to the processors directly connected to this processor.
<b>@odata.id</b>	string	<i>read-only</i>	Link to another Processor resource.
}]			
<b>ConnectedProcessors@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Endpoints</b> (v1.4+) [{	array		An array of links to the endpoints that connect to this processor.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Endpoint resource. See the Links section and the <i>Endpoint</i> schema for details.
}]			
<b>Endpoints@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>FabricAdapters</b> (v1.15+) [{	array		An array of links to the fabric adapters for this processor.

Property	Type	Attributes	Notes
<b>@odata.id</b>	string	<i>read-only</i>	Link to a FabricAdapter resource. See the Links section and the <i>FabricAdapter</i> schema for details.
}]			
<b>FabricAdapters@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>GraphicsController</b> (v1.12+) {}	object	(null)	A link to the graphics controller associated with this processor. See the <i>GraphicsController</i> schema for details on this property.
<b>Memory</b> (v1.11+) [{	array		An array of links to the memory associated with this processor.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a Memory resource. See the Links section and the <i>Memory</i> schema for details.
}]			
<b>Memory@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>NetworkDeviceFunctions</b> (v1.13+) [{ {}]	array (object)		The network device functions to which this processor performs offload computation, such as with a SmartNIC. See the <i>NetworkDeviceFunction</i> schema for details on this property.
<b>NetworkDeviceFunctions@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
<b>Oem</b> {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
<b>PCleDevice</b> (v1.4+) {	object		The link to the PCIe device associated with this processor. See the <i>PCleDevice</i> schema for details on this property.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCleDevice resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
<b>PCleFunctions</b> (v1.4+) [{	array		An array of links to the PCleFunctions associated with this processor.
<b>@odata.id</b>	string	<i>read-only</i>	Link to a PCleFunction resource. See the Links section and the <i>PCleFunction</i> schema for details.
}]			
<b>PCleFunctions@odata.count</b>	integer	<i>read-only</i>	The number of items in a collection.
}			
<b>Location</b> (v1.2+) {}	object		The location of the processor. See the <i>Resource</i> schema for details on this property.
<b>LocationIndicatorActive</b> (v1.10+)	boolean	<i>read-write</i> (null)	An indicator allowing an operator to physically locate this resource.

Property	Type	Attributes	Notes
<b>Manufacturer</b>	string	<i>read-only</i> (null)	The processor manufacturer.
<b>MaxSpeedMHz</b>	integer (MHz)	<i>read-only</i> (null)	The maximum clock speed of the processor.
<b>MaxTDPWatts</b> (v1.4+)	integer (Watts)	<i>read-only</i> (null)	The maximum Thermal Design Power (TDP) in watts.
<b>Measurements</b> (v1.11+, deprecated v1.14 [ { } ])	array (object)		An array of DSP0274-defined measurement blocks. See the <i>SoftwareInventory</i> schema for details on this property. <i>Deprecated in v1.14 and later. This property has been deprecated in favor of the ComponentIntegrity resource.</i>
<b>MemorySummary</b> (v1.11+){	object		The summary of all memory associated with this processor.
<b>ECCModeEnabled</b> (v1.13+)	boolean	<i>read-write</i> (null)	An indication of whether memory ECC mode is enabled for this processor.
<b>Metrics</b> (v1.11+){}	object		The link to the memory metrics associated with all memory of this processor. See the <i>MemoryMetrics</i> schema for details on this property.
<b>TotalCacheSizeMiB</b> (v1.11+)	integer (mebibytes)	<i>read-only</i> (null)	Total size of cache memory of this processor.
<b>TotalMemorySizeMiB</b> (v1.11+)	integer (mebibytes)	<i>read-only</i> (null)	Total size of volatile memory attached to this processor.
}			
<b>Metrics</b> (v1.4+){}	object		The link to the metrics associated with this processor. See the <i>ProcessorMetrics</i> schema for details on this property.
<b>MinSpeedMHz</b> (v1.8+)	integer (MHz)	<i>read-only</i> (null)	The minimum clock speed of the processor in MHz.
<b>Model</b>	string	<i>read-only</i> (null)	The product model number of this device.
<b>OperatingConfigs</b> (v1.9+){	object		The link to the collection operating configurations that can be applied to this processor. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>OperatingConfig</i> . See the <i>OperatingConfig</i> schema for details.
}			
<b>OperatingSpeedMHz</b> (v1.8+)	integer (MHz)	<i>read-only</i> (null)	Operating speed of the processor in MHz.



Property	Type	Attributes	Notes
<b>OperatingSpeedRangeMHz</b> (v1.13+) {	object (excerpt)		Range of allowed operating speeds (MHz). This object is an excerpt of the <a href="http://redfish.dmtf.org/schemas/v1/Control.json">http://redfish.dmtf.org/schemas/v1/Control.json</a> resource located at the URI shown in DataSourceUri.
<b>ControlMode</b>	string (enum)	read-write (null)	The current operating mode of the control. <i>For the possible property values, see ControlMode in Property details.</i>
}			
<b>PartNumber</b> (v1.7+)	string	read-only (null)	The part number of the processor.
<b>Ports</b> (v1.13+) {	object		The link to the collection of ports for this processor. Contains a link to a resource.
<b>@odata.id</b>	string	read-only	Link to Collection of <i>Port</i> . See the Port schema for details.
}			
<b>ProcessorArchitecture</b>	string (enum)	read-only (null)	The architecture of the processor. <i>For the possible property values, see ProcessorArchitecture in Property details.</i>
<b>ProcessorId</b> {	object		The identification information for this processor.
<b>EffectiveFamily</b>	string	read-only (null)	The effective family for this processor.
<b>EffectiveModel</b>	string	read-only (null)	The effective model for this processor.
<b>IdentificationRegisters</b>	string	read-only (null)	The raw manufacturer-provided processor identification registers for this processor.
<b>MicrocodeInfo</b>	string	read-only (null)	The microcode information for this processor.
<b>ProtectedIdentificationNumber</b> (v1.10+)	string	read-only (null)	The Protected Processor Identification Number (PPIN) for this processor.
<b>Step</b>	string	read-only (null)	The step value for this processor.
<b>VendorId</b>	string	read-only (null)	The vendor identification for this processor.
}			
<b>ProcessorMemory</b> (v1.4+) [ {	array		The memory directly attached or integrated within this processor.
<b>CapacityMiB</b> (v1.4+)	integer (mebibytes)	read-only (null)	The memory capacity in MiB.

Property	Type	Attributes	Notes
<b>IntegratedMemory</b> (v1.4+)	boolean	<i>read-only</i> (null)	An indication of whether this memory is integrated within the processor.
<b>MemoryType</b> (v1.4+)	string (enum)	<i>read-only</i> (null)	The type of memory used by this processor. <i>For the possible property values, see MemoryType in Property details.</i>
<b>SpeedMHz</b> (v1.4+)	integer	<i>read-only</i> (null)	The operating speed of the memory in MHz.
}]			
<b>ProcessorType</b>	string (enum)	<i>read-only</i> (null)	The type of processor. <i>For the possible property values, see ProcessorType in Property details.</i>
<b>SerialNumber</b> (v1.7+)	string	<i>read-only</i> (null)	The serial number of the processor.
<b>Socket</b>	string	<i>read-only</i> (null)	The socket or location of the processor.
<b>SparePartNumber</b> (v1.11+)	string	<i>read-only</i> (null)	The spare part number of the processor.
<b>SpeedLimitMHz</b> (v1.10+)	integer (MHz)	<i>read-write</i> (null)	The clock limit of the processor in MHz.
<b>SpeedLocked</b> (v1.10+)	boolean	<i>read-write</i> (null)	Indicates whether the clock speed of the processor is fixed at the value specified in the SpeedLimitMHz property.
<b>Status</b> {}	object		The status and health of the resource and its subordinate or dependent resources. See the <i>Resource</i> schema for details on this property.
<b>SubProcessors</b> (v1.3+){	object		The link to the collection of sub-processors associated with this system, such as cores or threads, that are part of a processor. Contains a link to a resource.
<b>@odata.id</b>	string	<i>read-only</i>	Link to Collection of <i>Processor</i> . See the Processor schema for details.
}			
<b>SystemInterface</b> (v1.8+){	object		The interface between the system and the processor.
<b>Ethernet</b> (v1.4+){	object		The Ethernet-related information for this interface.
<b>MaxLanes</b> (v1.4+)	integer	<i>read-only</i> (null)	The number of lanes supported by this interface.
<b>MaxSpeedMbps</b> (v1.4+)	integer (Mbit/s)	<i>read-only</i> (null)	The maximum speed supported by this interface.

Property	Type	Attributes	Notes
<b>Oem</b> (v1.4+) {}	object		The OEM extension property. See the <i>Resource</i> schema for details on this property.
}			
<b>InterfaceType</b> (v1.4+)	string (enum)	read-only (null)	The interface type. <i>For the possible property values, see InterfaceType in Property details.</i>
<b>PCle</b> (v1.4+) {	object		The PCIe-related information for this interface. See the <i>PCleDevice</i> schema for details on this property.
<b>@odata.id</b>	string	read-only	Link to a PCIeInterface resource. See the Links section and the <i>PCleDevice</i> schema for details.
}			
}			
<b>TDPWatts</b> (v1.4+)	integer (Watts)	read-only (null)	The nominal Thermal Design Power (TDP) in watts.
<b>TotalCores</b>	integer	read-only (null)	The total number of cores that this processor contains.
<b>TotalEnabledCores</b> (v1.5+)	integer	read-only (null)	The total number of enabled cores that this processor contains.
<b>TotalThreads</b>	integer	read-only (null)	The total number of execution threads that this processor supports.
<b>TurboState</b> (v1.9+)	string (enum)	read-only (null)	The state of the turbo for this processor. <i>For the possible property values, see TurboState in Property details.</i>
<b>UUID</b> (v1.4+)	string	read-only (null)	The UUID for this processor.
<b>Version</b> (v1.7+)	string	read-only (null)	The hardware version of the processor.

## 2.11.4 Actions

### 2.11.4.1 Reset (v1.6+)

#### Description

This action resets the processor.

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

### Action parameters

Parameter Name	Type	Attributes	Notes
<b>ResetType</b>	string (enum)	<i>optional</i>	The type of reset. <i>For the possible property values, see ResetType in Property details.</i>

### Request Example

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

## 2.11.5 Property details

### 2.11.5.1 BaseSpeedPriorityState:

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

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

### 2.11.5.2 ControlMode:

The current operating mode of the control.

string	Description
Automatic	Automatically adjust control to meet the set point.
Disabled	The control has been disabled.
Manual	No automatic adjustments are made to the control.
Override	User override of the automatic set point value.

### 2.11.5.3 FpgaType:

The FPGA type.

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

#### 2.11.5.4 InstructionSet:

The instruction set of the processor.

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

#### 2.11.5.5 InterfaceType:

The interface type.

string	Description
AMBA (v1.8+)	The Arm Advanced Microcontroller Bus Architecture interface.
CCIX (v1.8+)	The Cache Coherent Interconnect for Accelerators interface.
CXL (v1.8+)	The Compute Express Link interface.
Ethernet	An Ethernet interface.
OEM	An OEM-defined interface.
PCIe	A PCI Express interface.
QPI	The Intel QuickPath Interconnect.
UPI	The Intel UltraPath Interconnect.

### 2.11.5.6 MemoryType:

The type of memory used by this processor.

string	Description
Cache (v1.15+)	Processor cache.
DDR	Double data rate synchronous dynamic random-access memory.
DDR2	Double data rate type two synchronous dynamic random-access memory.
DDR3	Double data rate type three synchronous dynamic random-access memory.
DDR4	Double data rate type four synchronous dynamic random-access memory.
DDR5	Double data rate type five synchronous dynamic random-access memory.
Flash	Flash memory.
GDDR	Synchronous graphics random-access memory.
GDDR2	Double data rate type two synchronous graphics random-access memory.
GDDR3	Double data rate type three synchronous graphics random-access memory.
GDDR4	Double data rate type four synchronous graphics random-access memory.
GDDR5	Double data rate type five synchronous graphics random-access memory.
GDDR5X	Double data rate type five X synchronous graphics random-access memory.
GDDR6	Double data rate type six synchronous graphics random-access memory.
HBM1	High Bandwidth Memory.
HBM2	The second generation of High Bandwidth Memory.
HBM3	The third generation of High Bandwidth Memory.
L1Cache	L1 cache.
L2Cache	L2 cache.
L3Cache	L3 cache.
L4Cache	L4 cache.
L5Cache	L5 cache.
L6Cache	L6 cache.
L7Cache	L7 cache.

string	Description
OEM	OEM-defined.
SDRAM	Synchronous dynamic random-access memory.
SGRAM	Synchronous graphics RAM.
SRAM	Static random-access memory.

#### 2.11.5.7 ProcessorArchitecture:

The architecture of the processor.

string	Description
ARM	ARM.
IA-64	Intel Itanium.
MIPS	MIPS.
OEM	OEM-defined.
Power (v1.4+)	Power.
x86	x86 or x86-64.

#### 2.11.5.8 ProcessorType:

The type of processor.

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

### 2.11.5.9 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 system.
GracefulRestart	Shut down gracefully and restart the system.
GracefulShutdown	Shut down gracefully and power off.
Nmi	Generate a diagnostic interrupt, which is usually an NMI on x86 systems, to stop normal operations, complete diagnostic actions, and, typically, halt the system.
On	Turn on the unit.
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 full 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.

### 2.11.5.10 TurboState:

The state of the turbo for this processor.

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

## 2.11.6 Example response

```
{  
  "@odata.type": "#Processor.v1_14_0.Processor",  
}
```



```
"Name": "Processor",
"Id": "1",
"Socket": "CPU 1",
"ProcessorType": "CPU",
"ProcessorArchitecture": "x86",
"InstructionSet": "x86-64",
"Manufacturer": "Intel(R) Corporation",
"Model": "Multi-Core Intel(R) Xeon(R) processor 7xxx Series",
"ProcessorId": {
  "VendorId": "GenuineIntel",
  "IdentificationRegisters": "0x34AC34DC8901274A",
  "EffectiveFamily": "0x42",
  "EffectiveModel": "0x61",
  "Step": "0x1",
  "MicrocodeInfo": "0x429943"
},
"MaxSpeedMHz": 3700,
"TotalCores": 8,
"TotalThreads": 16,
"Status": {
  "State": "Enabled",
  "Health": "OK"
},
"Location": {
  "PartLocation": {
    "ServiceLabel": "Processor 1",
    "LocationType": "Socket",
    "LocationOrdinalValue": 0
  }
},
"@odata.id": "/redfish/v1/Systems/437XR1138R2/Processors/1"
}
```

## 3 Redfish documentation generator

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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>.