



Redfish v1.8 API Reference Document

V1.0



Revision History

Revision	Date	Reason For Change
1.0	2022/11/17	First Version

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1 Introduction

Redfish is a software solution developed to be fully compliant with DMTF Redfish specification. It allows users to browse physical resources at the chassis and system level through an intuitive web-based user interface. Redfish is web based management protocol. It is built upon Representational State Transfer (REST) which is itself based on HTTP 1.1 protocol. Redfish improves the scalability and help customers to integrate with existing tools.

Redfish is a hypermedia API with a small set of defined URI's. This document provides the API list supported by the Redfish Server and the HTTP methods for each URL in addition to a detailed explanation of the request and JSON response properties. As Redfish is built on OData specification, it discusses the OData properties and the OData identifier for the resources.

Redfish provides information categorized under specific resource end point. The redfish clients allows to utilize the end points using following HTTP methods:-

- GET
- POST
- PATCH
- PUT
- DELETE

Not all end-points support all these operations. When not supported it must send back 405 HTTP Status. Such details on the operations are provided by the Redfish JSON Schema.

Redfish Server follows DSP0266 1.8.0 Specification and Redfish Schema 2019.2.

2 Redfish API

2.1 Redfish URI Query Rule

URIs, as described in RFC3986, may also contain a query (?query) and a frag (#frag) components. Queries are addressed in the clause Query Parameters as Redfish Scalable Platforms Management API Specification DSP0266 described. Fragments (frag) shall be ignored by the server when used as the URI for submitting an operation.

Below is the table for URI query method/rule

Table 1 URI Query method Rule Example

Resource URI	Description
/redfish/v1/Systems?\$skip=1	Services support the odata query parameters. \$skip, \$top, \$expand, \$select
/redfish/v1/Systems?\$expand=* /redfish/v1/Systems?\$expand=. /redfish/v1/Systems?\$expand=~ /redfish/v1/Systems?\$expand=.(\$levels=2)	The \$expand query supports asterisk(*), period(.) and tilde(~) to determine which hyperlinks should be expanded. The \$levels indicates how many levels the service should cascade the expand operation.
/redfish/v1/Systems?\$except=1	Implementation shall return the 501, Not Implemented, status code for any query parameters starting with "\$" that are not supported, and should return an extended error indicating the requested query parameter(s) not supported for this resource.
/redfish/v1/?1	Implementations shall ignore unknown or unsupported query parameters that do not begin with "\$"
/redfish/v1/# /redfish/v1/#5555 /redfish/v1/##?\$top=1	Fragments(#frag) shall be ignored by the server when used as the URI for submitting an operation

2.2 Redfish API List

The following Redfish defined URI's are supported by the Redfish Service.

Table 2 Redfish API List

Resource	Resource URI	Redfish Schema
Service Root	/redfish/v1/	ServiceRoot.v1_5_2.ServiceRoot
Computer System Collection	/redfish/v1/Systems	ComputerSystemCollection.ComputerSystemCollection
Computer System	/redfish/v1/Systems/{{system instance}}	ComputerSystem.v1_8_0.ComputerSystem
BootOption Collection	/redfish/v1/Systems/{{systems instance}}/BootOptions	BootOptionCollection
BootOption	/redfish/v1/Systems/{{systems instance}}/BootOptions/{{BootOption Instance}}	BootOption.v1_0_3.BootOption
Memory	/redfish/v1/Systems/{{system instance}}/Memory/{{Memory instance}}	Memory.v1_8_0.Memory
Processor Collection	Collection 1: /redfish/v1/Systems/{{system instance}}/Processors Collection 2: /redfish/v1/Systems/{{system instance}}/Processors/{{Proc Instance}}/SubProcessors	ProcessorCollection.ProcessorCollection
Processor	Instance 1: /redfish/v1/Systems/{{system instance}}/Processors/{{system processor instance}} Instance 2:	Processor.v1_5_1.Processor

	/redfish/v1/Systems/{{system instance}}/Processors/{{Proc Instance}}/SubProcessors/{{SubProc instance}}	
Ethernet Interface Collection	/redfish/v1/Managers/{{manager instance}}/EthernetInterfaces	EthernetInterfaceCollection.EthernetInterfaceCollection
Bios	/redfish/v1/Systems/{{system instance}}/Bios /redfish/v1/Systems/{{system instance}}/Bios/SD	Bios.v1_1_0.Bios
Simple Storage Collection	/redfish/v1/Systems/{{system instance}}/SimpleStorage	SimpleStorageCollection.SimpleStorageCollection
Simple Storage	/redfish/v1/Systems/{{system instance}}/SimpleStorage/{{system simplestorage instance}}	SimpleStorage.v1_2_3.SimpleSt
LogServiceCollection	/redfish/v1/Systems/{{system instance}}/LogServices /redfish/v1/Managers/{{manager instance}}/LogServices /redfish/v1/TelemetryService/LogServices /redfish/v1/Chassis/{{chassis instance}}/LogServices	LogServiceCollection.LogServiceCollection
Log Service	/redfish/v1/Systems/{{system instance}}/LogServices/{{system log instance}} /redfish/v1/Managers/{{manager instance}}/LogServices/{{manager log instance}} /redfish/v1/TelemetryService/LogServices/{{telemetry log instance}} /redfish/v1/Chassis/{{chassis instance}}/LogServices/{{chassis log instance}}	LogService.v1_1_3.LogService
LogEntry Collection	/redfish/v1/Systems/{{system instance}}/LogServices/{{system log instance}}/Entries/redfish/v1/Managers/{{manager instanc	LogEntryCollection.LogEntryCollection

	<p>e}}/LogServices/{{manager log instance}}/Entries</p> <p>/redfish/v1/TelemetryService/LogServices/{{telemetry log instance}}/Entries</p> <p>/redfish/v1/Chassis/{{chassis instance}}/LogServices/{{chassis log instance}}/Entries</p>	
Log Entry	<p>/redfish/v1/Systems/{{system instance}}/LogServices/{{system log instance}}/Entries/{{system logentry instance}}</p> <p>/redfish/v1/Managers/{{manager instance}}/LogServices/{{manager log instance}}/Entries/{{ manager logentry instance}}</p> <p>/redfish/v1/TelemetryService/LogServices/{{telemetry log instance}}/Entries/{{telemetry logentry instance}}</p> <p>/redfish/v1/Chassis/{{chassis instance}}/LogServices/{{chassis log instance}}/Entries/{{chassis logentry instance}}</p>	LogEntry.v1_4_3.LogEntry
VLANNetwork InterfaceCollection	<p>/redfish/v1/Systems/{{system instance}}/EthernetInterfaces/{{system ethifc instance}}/VLANs</p> <p>/redfish/v1/Chassis/{{chassis instance}}/NetworkAdapters/{{network apadter instance}}/NetworkDeviceFunctions/{{network device function instance}}/Ethernet/VLANs</p>	VlanNetworkInterfaceCollection. VlanNetworkInterfaceCollection
VLAN Network Interface	<p>/redfish/v1/Systems/{{system instance}}/EthernetInterfaces/{{system ethifc instance}}/VLANs/{{system vlan instance}}</p> <p>/redfish/v1/Chassis/{{chassis instance}}/NetworkAdapters/{{network apadter instance}}/NetworkDeviceFunctions/{{network device function instance}}/Ethernet/VLANs/{{Vlan instance}}</p>	VlanNetworkInterface.v1_1_4. VlanNetworkInterface
ChassisCollection	<p>/redfish/v1/Chassis</p>	ChassisCollection.ChassisCollection

Chassis	/redfish/v1/Chassis/{{chassis instance}}	Chassis.v1_10_0.Chassis
Power	/redfish/v1/Chassis/{{chassis instance}}/Power	Power.v1_5_4.Power
Thermal	/redfish/v1/Chassis/{{chassis instance}}/Thermal	Thermal.v1_5_3.Thermal
ManagerCollection	/redfish/v1/Managers	ManagerCollection.ManagerCollection"
Manager	/redfish/v1/Managers/{{manager instance}}	Manager.v1_6_0.Manager
ManagersNetworkProtocol	/redfish/v1/Managers/{{manager instance}}/NetworkProtocol	ManagerNetworkProtocol.v1_4_2.ManagerNetworkProtocol
SerialInterfacesCollection	/redfish/v1/Managers/{{manager instance}}/SerialInterfaces	SerialInterfaceCollection.SerialInterfaceCollection
SerialInterfaces	/redfish/v1/Managers/{{manager instance}}/SerialInterfaces/{{manager serialifc instance}}	SerialInterface.v1_1_5.SerialInterface
VirtualMediaCollection	/redfish/v1/Managers/{{manager instance}}/VirtualMedia	VirtualMediaCollection.VirtualMediaCollection
Virtual Media	/redfish/v1/Managers/{{manager instance}}/VirtualMedia/{{virtualmedia instance}}	VirtualMedia.v1_3_2.VirtualMedia
AccountService	/redfish/v1/AccountService	AccountService.v1_6_0.AccountService
ManagerAccountCollection	/redfish/v1/AccountService/Accounts	ManagerAccountCollection.ManagerAccountCollection
ManagerAccount	/redfish/v1/AccountService/Accounts/{{account instance}}	ManagerAccount.v1_3_1.ManagerAccount
RoleCollection	/redfish/v1/AccountService/Roles	RoleCollection.RoleCollection
Role	/redfish/v1/AccountService/Roles/{{role instance}}	Role.v1_2_4.Role
EventDestinationCollection	/redfish/v1/EventService/Subscription	EventDestinationCollection.EventDestinationCollection

Event Destination	/redfish/v1/EventService/Subscriptions/{S ubscriptions_instance}	EventDestination.v1_6_0.Event Destination
EventService	/redfish/v1/EventService	EventService.v1_4_0.EventService
TaskService	/redfish/v1/TaskService	TaskService.v1_1_4.TaskService
Task Collection	/redfish/v1/TaskService/Tasks	TaskCollection.TaskCollection
Task	/redfish/v1/TaskService/Tasks/{task_insta nce}	Task.v1_4_2.Task
JSON Schema file collection	/redfish/v1/JsonSchemas	JsonSchemaFileCollection.JsonSchemaFileCollection
JSON Schema file	/redfish/v1/JsonSchemas/<json_schema name>	JsonSchemaFile.v1_1_4.JsonSchemaFile
Session Collection	/redfish/v1/SessionService/Sessions	SessionCollection.SessionCollection
Session Service	/redfish/v1/SessionService	SessionService.v1_1_6.SessionService
Session	/redfish/v1/SessionService/Sessions/{ses sion_id}	Session.v1_2_1.Session
MessageRegistry	redfish/v1/Registries/{Registry_instance.js on}	MessageRegistry.v1_3_1.MessageRegistry
MessageRegistryFileCollection	/redfish/v1/Registries	MessageRegistryFileCollection.MessageRegistryFileCollection
Message Registry File	/redfish/v1/Registries/{Registry_instance}	MessageRegistryFile.v1_1_3.MessageRegistryFile
NetworkInterface Collection	/redfish/v1/Systems/{system_instance}/N etworkInterfaces	NetworkInterfaceCollection.NetworkInterfaceCollection
NetworkInterface	/redfish/v1/Systems/{system_instance}/N etworkInterfaces/{NetworkInterface_insta nce}	NetworkInterface.v1_1_3.NetworkInterface

NetworkDeviceFunctionCollection	/redfish/v1/Chassis/{chassis instance}/NetworkAdapters/{networkadapter instance}/NetworkDeviceFunctions	NetworkDeviceFunctionCollection.NetworkDeviceFunctionCollection
NetworkDeviceFunction	/redfish/v1/Chassis/{chassis instance}/NetworkAdapters/{NetworkAdapter instance}/NetworkDeviceFunctions/{networkDeviceFunctions instance}	NetworkDeviceFunction.v1_3_3.NetworkDeviceFunction
NetworkAdapterCollection	/redfish/v1/Chassis/{chassis instance}/NetworkAdapters	NetworkAdapterCollection.NetworkAdapterCollection
NetworkAdapter	/redfish/v1/Chassis/{chassis instance}/NetworkAdapters/{networkadapter instance}	NetworkAdapter.v1_3_0.NetworkAdapter
StorageCollection	/redfish/v1/Systems/{system instance}/Storage	StorageCollection.StorageCollection
Storage	/redfish/v1/Systems/{system instance}/Storage/{Storage instance}	Storage.v1_7_1.Storage
VolumeCollection	/redfish/v1/Systems/{system instance}/Storage/{Storage instance}/Volumes	VolumeCollection.VolumeCollection
Volume	/redfish/v1/Systems/{system instance}/Storage/{Storage instance}/Volumes/{Volume instance}	Volume.v1_3_1.Volume
PCleDeviceCollection	/redfish/v1/Chassis/{chassis instance}/PCleDevices	PCleDeviceCollection.PCleDeviceCollection
PCleDevice	/redfish/v1/Chassis/{chassis instance}/PCleDevices/{PCleDevices instance}	PCleDevice.v1_4_0.PCleDevice
PCleFunctionCollection	/redfish/v1/Chassis/{chassis instance}/PCleDevices/{PCleDevices instance}/PCleFunctions	PCleFunctionCollection.PCleFunctionCollection
PCleFunction	/redfish/v1/Chassis/{chassis instance}/PCleDevices/{PCleDevices instance}/PCleFunctions/{PCleFunctions instance}	PCleFunction.v1_2_3.PCleFunction
UpdateService	/redfish/v1/UpdateService	UpdateService.v1_6_0.UpdateService
SecureBoot	/redfish/v1/Systems/{system instance}/SecureBoot	SecureBoot.v1_0_6.SecureBoot

Drives	/redfish/v1/Systems/{{system instance}}/Storage/{{Storage instance}}/Drives/{{Drive instance}}	Drive.v1_7_0.Drive
NetworkPort Collection	/redfish/v1/Chassis/{{chassis instance}}/NetworkAdapters/{{NetworkAdapter instance}}/NetworkPort	NetworkPortCollection. NetworkPortCollection
NetworkPort	/redfish/v1/Chassis/{{chassis instance}}/NetworkAdapters/{{NetworkAdapter instance}}/NetworkPort/{{NetworkPort instance}}	NetworkPort.v1_2_3. NetworkPort
MemoryDomainCollection	/redfish/v1/Systems/{{system instance}}/MemoryDomain	MemoryDomainCollection.Me memoryDomainCollection
MemoryDomain	/redfish/v1/Systems/{{system instance}}/MemoryDomain/{{MemoryDomain Instance}}	MemoryDomain.v1_2_3.Memo ryDomain
MemoryChunksCollection	/redfish/v1/Systems/{{system instance}}/MemoryDomain/{{MemoryDomain Instance}}/MemoryChunks	MemoryChunksCollection.Mem oryChunksCollection
MemoryDomain	/redfish/v1/Systems/{{system instance}}/MemoryDomain/{{MemoryDomain Instance}}/MemoryChunks/{{MemoryChunks Instance}}	MemoryChunks.v1_2_4.Memor yChunks
MemoryMetrics	/redfish/v1/Systems/Self/Memory/{{Memory instance}}/MemoryMetrics /redfish/v1/Systems/Self/MemorySummary/MemoryMetrics	MemoryMetrics.v1_2_0.Memor yMetrics
ProcessorMetrics	/redfish/v1/Systems/{{system instance}}/Processors/{{Processors instance}}/ProcessorMetrics	ProcessorMetrics.v1_0_2.Proces sorMetric
PCleSlots	/redfish/v1/Chassis/{{chassis instance}}/PCleSlots	PCleSlots.v1_1_1.PCLeSlots
AccelerationFunctionCollection	/redfish/v1/Systems/{{system instance}}/Processors/{{Processors instance}}/AccelerationFunctions	AccelerationFunctionCollection. AccelerationFunctionCollection
AccelerationFunction	/redfish/v1/Systems/{{system instance}}/Processors/{{Processors instance}}/AccelerationFunction	AccelerationFunction.v1_0_2.Ac celerationFunctionCollection

	rationFunctions/{{AccelerationFunction instance}}	
Assembly	/redfish/v1/Chassis/{{chassis instance}}/Assembly /redfish/v1/Systems/{{system instance}}/Storage/{{StorageId}}/Assembly /redfish/v1/Systems/{{system instance}}/Storage/{{Storage instance}}/Drives/{{Drive instance}}/Assembly /redfish/v1/Systems/{{system instance}}/Processors/{{Processor instance}}/Assembly /redfish/v1/Systems/{{system instance}}/Processors/{{Processor instance}}/SubProcessors/{{SubProcessor instance}}/Assembly /redfish/v1/Systems/{{system instance}}/Memory/{{Memory instance}}/Assembly /redfish/v1/Chassis/{{chassis instance}}/NetworkAdapters/{{NetworkAdapter instance}}/Assembly /redfish/v1/Chassis/{{chassis instance}}/PCleDevices/{{PCleDevice instance}}/Assembly	Assembly.v1_2_2.Assembly
SensorCollection	/redfish/v1/Chassis/{{chassis instance}}/SensorsSensorCollection.SensorCollection	SensorCollection.SensorCollection
Sensor	/redfish/v1/Chassis/{{chassis instance}}/Sensors/{{sensor instance}}	Sensor.v1_0_2.Sensor

Table 3 AMI OEM Extensions

Resource	Resource URI	Redfish Schema
Configurations	/redfish/v1/configurations	AMISchemas.v1_0_0.AMIConfigurations
AccountServiceConfigurations	/redfish/v1/AccountService/Configurations	AMISchemas.v1_0_0.AMIAccountServiceConfigurations
CertificateService	/redfish/v1/CertificateService	CertificateService.v1_0_2.CertificateService
CertificateCollection	/redfish/v1/AccountService/Accounts/{account_instance}/Certificates /redfish/v1/Managers/{manager_instance}/NetworkProtocol/HTTPS/Certificates /redfish/v1/Systems/{system_instance}/Boot/Certificates	CertificateCollection.CertificateCollection
Certificate	/redfish/v1/AccountService/Accounts/{account_instance}/Certificates/{certificate_instance} /redfish/v1/Managers/{manager_instance}/NetworkProtocol/HTTPS/Certificates/{certificate_instance} /redfish/v1/Systems/{system_instance}/Boot/Certificates/{certificate_instance}	Certificate.v1_1_1.Certificate

2.3 Redfish HostInterface API List

The following Redfish defined URI's are supported by the Redfish Service:

Table 4 Redfish HostInterfaceAPI List

Resource	Resource URI	Redfish Schema
HostInterface Collection	/redfish/v1/Managers/{manager_instance}/HostInterfaces	HostInterfaceCollection. HostInterfaceCollection
HostInterface	/redfish/v1/Managers/{manager_instance}/HostInterfaces/{hostinterface_instance}	HostInterface.v1_2_2.HostInterface
HostEthernet Interface Collection	/redfish/v1/Managers/{manager_instance}/HostInterfaces/{hostinterface_instance}/HostEthernetInterfaces	EthernetInterfaceCollection.EthernetInterfaceCollection
ManagerEthernetInterface Instance	/redfish/v1/Managers/{manager_instance}/EthernetInterfaces/usb0	EthernetInterface.v1_5_1.EthernetInterface

2.4 Redfish Telemetry API List

Table 5 Redfish Telemetry API List

Resource	Resource URI	Redfish Schema
TelemetryService	/redfish/v1/TelemetryService	TelemetryService.v1_1_2.TelemetryService
MetricDefinitionCollection	/redfish/v1/TelemetryService/MetricDefinitions	MetricDefinitionCollection.MetricDefinitionCollection
MetricDefinition	/redfish/v1/TelemetryService/MetricDefinitions/{MetricDefinitions_instance}	MetricDefinition.v1_0_3.MetricDefinition
MetricReportDefinition Collection	/redfish/v1/TelemetryService/MetricReportDefinitions	MetricReportDefinitionCollection.MetricReportDefinitionCollection

MetricReport Definition	/redfish/v1/TelemetryService/MetricReportDefinitions/{{ MetricReportDefinitions_instance}}	MetricReportDefinition.v1_3_0.MetricReportDefinition
MetricReport Collection	/redfish/v1/TelemetryService/MetricReports	MetricReportCollection.MetricReportCollection
Metric Report	/redfish/v1/TelemetryService/MetricReports/{{MetricReport_instance}}	MetricReport.v1_2_0.MetricReport
TriggerCollection	/redfish/v1/TelemetryService/Triggers	TriggersCollection.TriggersCollection
Trigger	/redfish/v1/TelemetryService/{{Triggers_instance}}	Trigger.v1_1_1.Trigger
TelemetryLogService	/redfish/v1/TelemetryService/LogService	LogService.v1_1_3.LogService
TelemetryLogEntry Collection	/redfish/v1/TelemetryService/LogService/Entries	LogEntryCollection.LogEntryCollection
TelemetryLogEntry	/redfish/v1/TelemetryService/LogService/Entries/{{Entries_instance}}	LogEntry.v1_4_3.LogEntry

2.5 Redfish Composability API List

Table 6 Redfish Composability API List

Resource	Resource URI	Redfish Schema
Composition Service	/redfish/v1/CompositionService	CompositionService.v1_1_2.CompositionService
ResourceBlocksCollection	/redfish/v1/CompositionService/ResourceBlocks	ResourceBlockCollection.ResourceBlockCollection
ResourceBlocks	/redfish/v1/CompositionService/ResourceBlocks/{{ResourceBlock_instance}}	ResourceBlock.v1_3_2.ResourceBlock
ResourceZoneCollection	/redfish/v1/CompositionService/ResourceZones	ZoneCollection.ZoneCollection
ResourceZone	/redfish/v1/CompositionService/ResourceZones/{{ResourceZones_instance}}	Zone.v1_3_1.Zone
Capabilities	/redfish/v1/Systems/Capabilities	ComputerSystem.v1_8_0.ComputerSystem

2.6 Redfish API Definition

2.6.1 OData Support

Redfish API support Odata v4.0 as it is defined in Redfish specification. All resources within this REST API are identified by unique identifier property named @odata.id. Resource Identifiers shall be represented in JSON payloads as URI paths relative to the Redfish Schema portion of the URI. That is, they shall always start with /redfish/. The resource identifier is the canonical URL for the resource and can be used to retrieve or edit the resource, as appropriate. OData Properties that are part of the JSON response for every Redfish Resource is defined under [Section 3.1.](#)

2.6.2 Protocol Version

The protocol version is separate from the version of the resources or the version of the Redfish Schema supported by them.

The root URI for this version of the Redfish protocol shall be /redfish/v1/.

While the major version of the protocol is represented in the URI, the major version, minor version and errata version of the protocol are represented in the Version property of the Service Root resource, as defined in the Redfish Schema for that resource. The protocol version is a string of the form:

- Major Version, Minor Version, Errata
- Major Version: integer: something in the class changed in a backward incompatible way.
- Minor Version: integer: a minor update. New functionality may have been added but nothing removed. Compatibility will be preserved with previous minor versions.

Errata: integer: something in the prior version was broken and needed to be fixed.

Any resource discovered through links found by accessing the root service or any service or resource referenced using references from the root service shall conform to the same version of the protocol supported by the root service.

2.6.3 URI Rules

Redfish Service supports a small set of defined default URIs without authentication. They are:

Table 7 URIs without authentication

URI	Description
/redfish	URI used to return the version
/redfish/v1/	URI for the Redfish Service Root
/redfish/v1/odata	URI for OData Service Document
/redfish/v1/\$metadata	URI for metadata document
/redfish/v1/openapi.yaml	URI for OpenAPI document

The following Redfish URI is redirected to the Associated URI as given below:

Table 8 Associated URI

URI	Description
/redfish/v1	/redfish/v1/

The other defined and relative Redfish URIs are accessed using basic Authentication. Those URIs are explained in [Section 3](#).

2.6.3.1 Redfish URI Rules for Redirection

All URI's given in Redfish API List in Table 1 with a trailing slash will be redirected to the same URI without a trailing slash and will send the response status and body as the original URI's in Table 1.

For example: “/redfish/v1/Systems/{{system_instance}}/” with a trailing slash will be redirected to “/redfish/v1/Systems/{{system_instance}}” and both will display the same response.

2.6.3.2 Allowable URI Characters

URIs shall not include any RFC1738-defined unsafe characters.

For example, the {, }, |, ^, ~, [,], ` , and \ characters are unsafe because gateways and other transport agents can sometimes modify these characters.

- The following are the restricted URI Characters separated by comma:-

{, }, |, ^, ~, ` , \, [,], ?, /, #, <, >, _ ,

Note: Last Comma is also included in the restricted characters.

- Do not use the # character for anything other than the start of a fragment

2.7 Requests

This section describes the requests that can be sent to Redfish services.

2.7.1 Authorization

As per current implementation, Basic Auth is considered as first priority and Session Auth is considered as second priority and hence we will be returning Status Codes as below :

- Valid Authorization and Invalid X-Auth-Token - Access Granted
- Invalid Authorization and Valid X-Auth-Token - 401 AccessDenied (*)
- Invalid Authorization and Invalid X-Auth-Token - 401 AccessDenied
- No Authorization and Valid X-Auth-Token - Access Granted

*The ability to check for the validity of both "Authorization" and "X-Auth-Token" headers will increase the overall response time of GET requests.

Important: Session Authentication can be used only when No Authorization headers are given in the requests.

Note: To make the redfish password more secure, we are using dynamic salt(separate salt value for each redfish user) instead of static salt and will use SHA512 digest for generating password hash.

2.7.2 Read Requests (GET)

The GET method is used to retrieve a representation of a resource. That representation can either be a single resource or a collection.

Note: From RTP1.5.b GET response data will be cached in RAM for faster response time, this will increase the VSZ usage by 2 to 3%.(According to response data size)

2.7.2.1 Service Root Request

The root URL for Redfish version 1 services shall be "/redfish/v1/". The root URL for the service returns a ServiceRoot resource as defined by this specification.

2.7.2.2 Metadata Document Request

Redfish services shall expose a metadata document describing the service at the "/redfish/v1/\$metadata " resource. The Services shall not require authentication in order to retrieve the metadata document.

2.7.2.3 *OData Service Document Request*

Redfish services shall expose an OData Service Document, at the /redfish/v1/odata resource. This service document provides a standard format for enumerating the resources. Services shall not require authentication in order to retrieve the service document.

2.7.2.4 *Resource Retrieval Requests*

Clients request resources by issuing GET requests to the URI for the individual resource or resource collection. The URI for a resource or resource collection may be obtained from a resource identifier property returned in a previous request

2.7.2.5 *HEAD*

The HEAD method differs from the GET method in that it MUST NOT return message body information. However, all of the same meta-information and status codes in the HTTP headers will be returned as though a GET method were processed, including authorization checks. Services may support the HEAD method in order to return meta-information in the form of HTTP response headers. Services may support the HEAD method in order to verify link validity. Services may support the HEAD method in order to verify resource accessibility. Services shall not support any other use of the HEAD method. The HEAD method shall be idempotent in the absence of outside changes to the resource.

2.7.3 *Data Modification Requests*

Clients create, modify, and delete resources by issuing the appropriate Create, Update, Replace or Delete operation, or by invoking an Action on the resource.

All the data modification requests will be validated in following order,

1. Validation for valid-URI -> 404 StatusCode for Invalid URI's
2. Validation for valid Method -> 405 StatusCode for Invalid Method
3. Validation for valid request body -> 415 StatusCode for Invalid RequestBody Type
4. Authorization -> 401 StatusCode for Invalid Redfish Credentials
5. User Privilege -> 403 StatusCode for Insufficient Redfish Privileges for the given Redfish Account in Authorization.

Note: The maximum request size set for request body in Redfish is 20KB.

2.7.3.1 Update (PATCH)

The PATCH method is the preferred method used to perform updates on pre-existing resources. Changes to the resource are sent in the request body. Properties not specified in the request body are not directly changed by the PATCH request. The response is either empty or a representation of the resource after the update was done. The implementation may reject the update operation on certain fields based on its own policies and, if so, shall not apply any of the update requested.

Note :

- From RTP 1.5 and onwards all PATCH request requires a valid precondition header (If-Match or If-None- Match) with the request as per Redfish 1.5 Specification. Any request without precondition header will be rejected with HTTP-428-PreConditionRequired, and request with failed precondition header will be rejected with HTTP-412-PreConditionFailed.
- The size of individual properties of type "string" is by default limited to 500B. But it can be changed in "property-size" table during build time if required.

2.7.3.2 Replace (PUT)

The PUT method is used to completely replace a resource. Properties omitted from the request body are reset to their default value.

Note : From RTP 1.5 and onwards all PUT request requires a valid precondition header (If-Match or If- None-Match) with the request as per Redfish 1.5 Specification. Any request without precondition header will be rejected with HTTP-428-PreConditionRequired, and request with failed precondition header will be rejected with HTTP-412-PreConditionFailed.

2.7.3.3 Create (POST)

The POST method is used to create a new resource. The POST request is submitted to the resource collection in which the new resource is to belong. Submitting a POST request to a resource representing a collection is equivalent to submitting the same request to the Members property of that resource.

2.7.3.4 Delete (DELETE)

The DELETE method is used to remove a resource. Services shall support the DELETE method for resources that can be deleted.

2.7.3.5 *Actions (POST)*

The POST method is used to initiate operations on the object (such as Actions). Services shall support the POST method for sending actions. The POST operation may not be idempotent.

2.8 Responses

This section describes about the response headers, Error codes, and response format used in Redfish v0.3 update.

2.8.1 Response Headers

The response messages specified in this document refers to [Redfish 1.7.0 Specification](#)

2.8.2 Redfish Error Response

In the case of an error, Redfish REST API responds with an HTTP status code, as defined by the HTTP 1.1 specification and constrained by additional requirements defined in this specification.

HTTP Response: status codes alone often do not provide enough information to determine the error cause. The Redfish REST API returns extended error information as a JSON object with a single property named error.

Table 9 Error Code Response

Attribute	Description
Message ID	String indicating a specific error or message (not to be confused with the HTTP status code). This code can be used to access a detailed message from a message registry.
Message	This is the human readable message, if provided. This property shall contain an optional human readable message.
Message Args	An optional array of strings representing the substitution parameter values for the message. This shall be included in the Response: if a Message ID is specified for a parameterized message.
Severity	An optional string representing the severity of the error.
Resolution	An optional string describing recommended action(s) to take to resolve the error.
Related Properties	An optional array of JSON Pointers defining the specific properties within a JSON payload described by the message.

2.8.2.1 *Common Error Status Codes*

The following are the common error codes that are handled in Redfish:

404 Not Found

The request specified a URI of a resource that does not exist. This status code is returned for any of the HTTP Methods namely GET, POST, PATCH, DELETE and PUT.

400 Bad Request

The request could not be processed because it contains missing or invalid information (such as validation error on an input field, a missing required value, and so on). An extended error shall be returned in the response body, as defined in the above mentioned table.

This is typically returned with PATCH or POST response involving request parameters.

405 Method Not Found

The HTTP verb specified in the request (e.g., DELETE, GET, HEAD, POST, PUT, PATCH) is not supported for this request URI. The response shall include an Allow header which provides a list of methods that are supported by the resource identified by the Request-URI.

This is typically returned with POST, PATCH, DELETE, PUT on the URL for which it's not supported.

2.8.2.2 *Request Validation Sequence*

1. Check authorization. If not granted, throw 401 "Security.1.0.AccessDenied"
2. Check entity privilege. If not granted, throw 403 "Security.1.0.InsufficientPrivilege".
3. Check if the URI exists or not. If it doesn't exist, throw 404 "Base.1.0.0.ResourceMissingAtURI"
4. Check whether Redfish is in firmware update. If Redfish is in firmware update, throw 403. "Security.1.0.FWUpdateInProgress".
5. Check allow method. If operation not allowed, throw 405 "HttpStatus.1.0.MethodNotAllowed".
6. Check request body media type. If not correct, throw 415 "HttpStatus.1.0.UnsupportedMediaType".
7. Check request body format. If not correct, throw 400 "Base.1.0.UnrecognizedRequestBody".
8. If the request method is PUT /PATCH check for precondition header and if header is not present, throw 428 "Ami.1.0.PreconditionHeaderMissing". If header is

available validate Precondition Header and throw 412
"HttpStatus.1.0.PreconditionFailed" if validation failed.

9. Check for property validation errors in request-body and throw suitable 400
BadRequest error.

2.8.3 Status Codes

The status codes of each and every response is tabulated in the chapter 6.5.2 in [Redfish 1.7.0 Specification](#).

3 Redfish Resources

This Section explains the Request URI' and JSON Responses for the allowable HTTP methods for each of the Redfish Resources as explained below from [Section 3.4](#). [Section 3.1](#) explains the OData properties that are common to all the Redfish Entities. [Section 3.2](#) explains the user configurable properties and its reference document for the list. [Section 3.3](#), Resource Entity give a brief list of properties which are inherited by all Entities in the Sections given below from 3.4.

Important: The following Note

(M) - DeNotes the mandatory attributes.

(N) - DeNotes Navigation Property.

Note: The properties in Resource Type is inherited by all properties

(C) - DeNotes Configurable Property

Please refer the Section "Configurable Keys" in "How to Add OEM extensions" document which needs to be populated at build time to get this property in the JSON response.

3.1 ODATA Properties

OData Properties are used to provide information on the resource like its ID, type, context, etc. accessed by an URI. The following are the properties used in Redfish:

For Eg:

```
{
  "@odata.context": "/redfish/v1/$metadata#ServiceRoot",
  "@odata.etag": "W/1488550735\"",
  "@odata.id": "/redfish/v1/",
  "@odata.type": "#ServiceRoot.v1_0_2.ServiceRoot"
}
```

Table 10 OData Attributes

Name	Type	ReadOnly	Description
@odata.context	String	True	The value of this property shall be the context URL that describes the resource according to OData-Protocol and shall be of the form defined in the Redfish specification.
@odata.id	String	True	The value of this property shall be the unique identifier for the resource and it shall be of the form defined in the Redfish specification.
@odata.type	String	True	The value of this property shall be an absolute URL that specifies the type of the resource and it shall be of the form defined in the Redfish specification. The type values for each Redfish Entity gives the schema it follows and is mentioned in Redfish API List under Schema column.
@odata.etag			ETags provide the ability to conditionally retrieve or update a resource. This value gives the timestamp at which the resource properties have been initialized or modified. Note: According to Redfish Specification 1.7.0 under section 6.1.5 Etags, we have "An ETag is a time stamp value that changes when the underlying object changes So the etag for all Collection resources in Redfish will change if the etag of the underlying instances change.
@odata.nextLink	String	True	Format : uri-reference The URI to the resource containing the next set of partial members. NormalRule It is applicable only for collections and can display only 50 entries a time. If the entries are less than 50, then Members@odata.nextLink property will not be displayed. For example, if only 30 logs, Members@odata.nextLink will not be shown. If it has 63 logs, then Members@odata.nextLink will show.

Note: These ODATA properties should be present in each JSON response for all Redfish URI's mentioned in the document.

From RTP 1.7 onwards, AMI's redfish implementation supports strong etag support. If a client calls PUT or PATCH to update a resource, it should include an ETag from a previous GET in the HTTP If-Match or If-None-Match header. If a service supports the return of the ETag header on a resource, the service may respond with HTTP 428 status code if the If-Match or If-None-Match header is missing from the PUT or PATCH request for the same resource, as specified in RFC6585

The format of the ETag header is: ETag: "<string>"

In addition to the return of the ETag property on each resource, a Redfish Service should return the ETag header on:

- A client PUT, POST, or PATCH operation
- A GET operation for an individual resource

3.2 User Configurable Properties

Redfish allows the user to specify default values for some properties in the existing Redfish Entities like the maximum number of records, overwrite policy in Log Services, sensor related properties in Chassis Thermal, Voltage, Temperature, Power etc. and some properties in all the services namely Event, Task, Session and Account Service. These properties can be configured through redis commands as specified in the Configurable Properties Section in "MegaRAC Redfish - How to Add OEM extensions" document.

Note: For detailed list of properties, refer "MegaRAC Redfish - How to Add OEM extensions" document.

3.3 Resource

The resource properties specified in this Section are inherited by all API's mentioned in this document. The following are the different Resource schema properties.

Note: Id and Name property of Resource Schema is mandated by all the URI's.

Table 11 Resource Type Definitions

Name	Type	Read Only	Description			
Id	String	True	Uniquely identifies the resource within the collection of like resources.			
Description	Null,String	True	Provides a description of this resource and is used for commonality in the schema definitions.			
Name	String	True	This object represents the Name property.			
UUID	String	True	pattern: ([0-9a-f]{8}-[0-9a-f]{4}-[0-9a-f]{4}-[0-9a-f]{4}-[0-9a-f]{12})			
Identifier	Object	True	Name	Type	Read Only	Description
			DurableName	String	True	This indicates the world wide, persistent name of the resource.
			DurableName Form at		True	This represents the format of the

All Enum Types mentioned in this table of “String Type”.

Table 12 Resource - Enum Types

State	
Enum	Description
Enabled	This function or resource has been enabled
Disabled	This function or resource has been disabled
StandbyOffline	This function or resource is enabled, but awaiting an external action to activate it
StandbySpare	This function or resource is part of a redundancy set and is awaiting a failover or other external action to activate it.
InTest	This function or resource is undergoing testing
Starting	This function or resource is starting
Absent	This function or resource is not present or not detected
UnavailableOffline	This function or resource is present but cannot be used.
Deferring	The element will not process any commands but will queue new requests
Quiesced	The element is enabled but only processes a restricted set of commands.
Updating	The element is updating and may be unavailable or degraded.
Reset	
On	Turn the system on
ForceOff	Turn the system off immediately (non-graceful) shutdown
GracefulShutdown	Perform a graceful system shutdown and power off
ForceRestart	Perform an immediate (non-graceful) shutdown, followed by a restart of the system
Health /HealthRollup	
OK	Normal
Warning	A condition exists that requires attention.
Critical	A critical condition exists that requires immediate attention.
IndicatorLED	
Lit	The Indicator LED is lit.
Blinking	The Indicator LED is blinking.

Off	The Indicator LED is off.
-----	---------------------------

Table 13 Resource Complex Types

Links			
Property Name	Type	Description	
Oem	Object	This object represents the Oem property. It can also contain an object of type OemObject.	
Status			
Property Name	Type	Read Only	Description
State	String	True	<p>This property shall represent if this component is available or not and why. Refer</p> <p>Table 12 Resource - Enum Types for Resource. State for the possible Enum values. Enabled indicates the resource is available. Disabled indicates the resource has been intentionally made unavailable but it can be enabled. Offline indicates the resource is unavailable intentionally and requires action to be made available. In Test indicates that the component is undergoing testing. Starting indicates that the resource is on its way to becoming available. Absent indicates the resources is physically unavailable</p>
HealthRoll up	String	True	This property shall represent the HealthState of the resource and its dependent resources.
Health	String	True	This property shall represent the HealthState of the resource without considering its dependent resources.
Oem	Object	False	Oem extension object. This object represents the Oem properties.

Table 14 Resource.v1_8_1 schema properties

Links				
Property Name	Type	Read Only	Description	
DurableName	String	True	This property shall contain the world wide unique identifier for the resource.	
DurableNameFormat	String	True	This property shall represent the format of the DurableName property.	
			Enum	Description
			NAA	This durable name shall be a hexadecimal representation of the Name Address Authority structure as defined in the T11 Fibre Channel - Framing and Signaling - 3 (FC-FS-3) specification
			FC_WWN	This durable name shall be a hexadecimal representation of the World Wide Name format as defined in the T11 Fibre Channel Physical and Signaling Interface Specification.
			UUID	This durable name shall be the hexadecimal representation of the Universal Unique Identifier as defined in the International Telecommunication Union's OSI networking and system aspects - Naming, Addressing and Registration Specification.
			EUI	This durable name shall be the hexadecimal representation of the IEEE-defined 64-bit Extended Unique Identifier as defined in the IEEE's Guidelines for 64-bit Global Identifier (EUI-64) Specification.
iQN	This durable name shall be in the iSCSI Qualified Name format as defined in RFC 3720 and RFC 3721			
Location				
Name	Type	Read only	Description	

AltitudeMeters	Number	True	The altitude of the resource in meters.			
Latitude	Number	True	The latitude resource.			
Longitude	Number	True	The longitude resource in degrees.			
Oem	Object	True	Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document			
Contacts	Array	True	Array of contact information.			
			Name	Type	Read Only	Description
			ContactName	String	False	Name of this contact.
			EmailAddress	String	False	Email address for this contact.
			PhoneNumber	String	False	Phone number for this contact.
PartLocation	Object	True	Postal address of the addressed resource.			
			Name	Type	Read Only	Description
			LocationOrdinalValue	number	true	The number that represents the location of the part. If Location Type is slot and this unit is in slot 2 then the LocationOrdinalValue will be 2.
			LocationType	Object	true	The type of location of the part, such as slot, bay, socket and slot.
			Enum	Description		
			Slot	Defines a slot as the type of location		
			Bay	Defines a bay as the type of location		

						Connector	Defines a connector as the type of location.
						Socket	Defines a socket as the type of location.
			Orientation	Object	true	The orientation for the ordering of the slot enumeration used by the LocationOrdinalValue property.	
						Enum	Description
						FrontToBack	Defines the ordering for the LocationOrdinalValue is front to back.
						BackToFront	Defines the ordering for the LocationOrdinalValue is back to front.
						TopToBottom	Defines the ordering for the LocationOrdinalValue is top to bottom.
						BottomToTop	Defines the ordering for the LocationOrdinalValue is bottom to top.
						LeftToRight	Defines the ordering for the LocationOrdinalValue is left to right.
						RightToLeft	Defines the ordering for the LocationOrdinalValue is right to left.

			Reference	Object	true	Defines a reference area for the location of the part.																
						<table border="1"> <thead> <tr> <th>Enum</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Top</td> <td>Defines the part as being in the top of the unit.</td> </tr> <tr> <td>Bottom</td> <td>Defines the part as being in the bottom of the unit.</td> </tr> <tr> <td>Front</td> <td>Defines the part as being in the front of the unit.</td> </tr> <tr> <td>Rear</td> <td>Defines the part as being in the rear of the unit.</td> </tr> <tr> <td>Left</td> <td>Defines the part as being in the left of the unit.</td> </tr> <tr> <td>Right</td> <td>Defines the part as being in the right of the unit.</td> </tr> <tr> <td>Middle</td> <td>Defines the part as being in the middle of the unit.</td> </tr> </tbody> </table>	Enum	Description	Top	Defines the part as being in the top of the unit.	Bottom	Defines the part as being in the bottom of the unit.	Front	Defines the part as being in the front of the unit.	Rear	Defines the part as being in the rear of the unit.	Left	Defines the part as being in the left of the unit.	Right	Defines the part as being in the right of the unit.	Middle	Defines the part as being in the middle of the unit.
Enum	Description																					
Top	Defines the part as being in the top of the unit.																					
Bottom	Defines the part as being in the bottom of the unit.																					
Front	Defines the part as being in the front of the unit.																					
Rear	Defines the part as being in the rear of the unit.																					
Left	Defines the part as being in the left of the unit.																					
Right	Defines the part as being in the right of the unit.																					
Middle	Defines the part as being in the middle of the unit.																					
			ServiceLabel	String	true																	
PostalAddresses	Object	False	A place within the addressed location.																			
			Name	Type	Read Only	Description																
			Additional Info	String	false	Area designation or other additional info.																
			Additional Code	String	False	The value shall conform the requirements of the ADDCODE field as defined in RFC5139.																
			Building	String	False	Name of the building.																

			City	String	False	City, township, or shi (JP).
			Community	String	False	Postal community name.
			Country	String	False	The value shall conform the requirements of the Country field as defined in RFC5139.
			District	String	False	A county, parish, gun (JP), or district (IN).
			Division	String	False	City division, borough, dity district, ward, chou (JP).
			Floor	String	False	The value shall conform the requirements of the FLR field as defined in RFC5139. It is used to provide a floor designation. Numeric portion of house number.
			HouseNumber	String	False	
			HouseNumber Suffix	String	False	House number suffix.
			Landmark	String	False	The value shall conform the requirements of the LMK field as defined in RFC5139. It is used to identify a landmark or vanity address.
			LeadingStreet Direction	String	False	A leading street direction.
			Location	String	False	Room designation or other additional info.
			Name	String	False	The value shall conform the requirements of the NAM field as defined in RFC5139. It is used to name the occupant.
			POBox	String	False	Post office box (P.O. box).

			PlaceType	String	False	A description of the type of place that is addressed.
			PostalCode	String	False	Postal code (or zip code).
			Road	String	False	A primary road or street.
			RoadBranch	String	False	Road Branch
			RoadPostModifier	String	False	Road post-modifier.
			RoadPreModifier	String	False	Road pre-modifier.
			RoadSection	String	False	Road Section
			RoadSubBranch	String	False	Road Sub Branch
			Room	String	False	Name or number of the room.
			Seat	String	False	Seat (desk, cubicle, workstation).
			Street	String	False	Street name
			StreetSuffix	String	False	Avenue, Platz, Street, Circle.
			Territory	String	False	A top-level subdivision within a country.
			TrailingStreetSuffix	String	False	A trailing street suffix.
			Unit	String	False	Name or number of the unit (apartment, suite).
			Neighborhood	String	False	Neighborhood or block.
Placement	Object	False	Postal address of the addressed resource.			
			Name	Type	Read Only	Description
			Additional Info	String	false	Area designation or other additional info.
			Rack	String	false	Name of a rack location within a row.

			RackOffset	Number	False	Vertical location of the item in terms of RackOffsetUnits.	
			RackOffsetUnits	String	false	Enum	Description
						OpenU	Defines a rack unit as being equal to 48 mm (1.89 in).
						EIA_310	Defines a rack unit as being equal to 1.75 in (44.45 mm).
			Row	String	False	Name of row	

Table 15 Enum Types – Indicator LED

Member Name	Description
Lit	The Indicator LED is lit.
Blinking	The Indicator LED is blinking
Off	The Indicator LED is off.

Note: The properties in Resource Type is inherited by all properties

3.4 Service Root

This resource represents the root of the Redfish service, located at the "redfish/v1/" URI. As a hypermedia API, all other resources accessible through the Redfish interface on this device are linked directly or indirectly from the Service Root.

3.4.1 GET

3.4.1.1 Request

https://{{ip}}/redfish/v1/

Content-Type: application/json

3.4.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 16 Service Root Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extensions" document. Refer below table "Oem Object "for more information.
Id(M)	String	True	Refer Section 3.3
Name(M)	String	True	Refer Section 3.3
Description	String	True	Provides description of the resource. Refer Section 3.3
UUID	String	True	Refer Section 3.3

RedfishVersion	String	True	The value of this string shall represent the version of the Redfish service. The format of this string shall be of the format majorversion.minorversion.errata in compliance with Protocol Version Section of the Redfish specification.			
Product	String	True	The product name associated with this Redfish service.			
ProtocolFeaturesSupported	Object	True	Contains information about protocol features supported by the service.			
			Name	Type	Read only	Description
			ExcerptQuery	Boolean	True	This indicates whether the 'excerpt' query parameter is supported.
			ExpandQuery	Object	True	Contains information about the use of \$expand in the service. Refer Table 17 ExpandQuery Properties.
			FilterQuery	Boolean	True	This indicates whether the \$filter query parameter is supported.
			OnlyMemberQuery	Boolean	True	This indicates whether the 'only' query parameter is supported.
			SelectQuery	Boolean	True	This indicates whether the \$select query parameter is supported.
Systems(N)	Object	True	Link to a collection of Systems			
Chassis(N)	Object	True	Link to a collection of Chassis			
Managers(N)	Object	True	Link to a collection of Managers			
Tasks(N)	Object	True	Link to Task Service			
AccountService(N)	Object	True	Link to the Account Service.			
EventService(N)	Object	True	Link to the Event Service.			

SessionService(N)	Object	True	Link to the Session Service.			
Registries(N)	Object	True	Link to a collection of Registries.			
JsonSchemas(N)	Object	True	Link to a collection of Json-Schema files.			
UpdateService(N)	Object	True	Link to the UpdateService.			
CompositionService	Object	True	Link to the CompositionService.			
TelemetryService	Object	True	Link to the TelemetryService.			
Vendor	String	True	The vendor or manufacturer associated with this Redfish service.			
CertificateService	Object	True	Link to the CertificateService			
Links(M)	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource.			
			Property Name	Type	Read Only	Description
			Oem	Object	False	OEM extension object, Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document.
			Sessions	Array	True	Link to a collection of Sessions

Table 17 ExpandQuery Properties

Name	Type	Read Only	Description
ExpandAll	Boolean	True	This indicates whether the \$expand support of asterisk (expand all entries) is supported.
Levels	Boolean	True	This indicates whether the expand support of the \$levels qualifier is supported by the service.
Links	Boolean	True	This indicates whether the \$expand support of tilde (expand only entries in the Links section) is supported.
MaxLevels	Boolean	True	This indicates the maximum number value of the \$levels qualifier in \$expand operations.
NoLinks	Boolean	True	This indicates whether the \$expand support of period (expand only entries not in the Links section) is supported.

Table 18 Oem Object

Name	Type	Read Only	Description																
Ami	Object	True	Contains information related to AMI features supported by the service.																
			<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>@odata.type</td> <td>String</td> <td>True</td> <td>Refer Section 3.1</td> </tr> <tr> <td>Configurations</td> <td>Object</td> <td>True</td> <td>A reference to AMI Oem Configurations URI. Note: Links will be available only when AMI OEM Extension feature is enabled in BMC Image in PRJ.</td> </tr> <tr> <td>InventoryData Status</td> <td>Object</td> <td>True</td> <td>A reference to the InventoryData Status URI. Note: Links will be available only when AMI OEM Host Interface feature is enabled in ASUS BMC Image in PRJ and for this Link to be</td> </tr> </tbody> </table>	Name	Type	Read only	Description	@odata.type	String	True	Refer Section 3.1	Configurations	Object	True	A reference to AMI Oem Configurations URI. Note: Links will be available only when AMI OEM Extension feature is enabled in BMC Image in PRJ.	InventoryData Status	Object	True	A reference to the InventoryData Status URI. Note: Links will be available only when AMI OEM Host Interface feature is enabled in ASUS BMC Image in PRJ and for this Link to be
			Name	Type	Read only	Description													
			@odata.type	String	True	Refer Section 3.1													
Configurations	Object	True	A reference to AMI Oem Configurations URI. Note: Links will be available only when AMI OEM Extension feature is enabled in BMC Image in PRJ.																
InventoryData Status	Object	True	A reference to the InventoryData Status URI. Note: Links will be available only when AMI OEM Host Interface feature is enabled in ASUS BMC Image in PRJ and for this Link to be																



						visible refer section 10 for further details o this URI.
			RtpVersion	String	True	This indicates the Redfish Technology Pack version.
Dre	Object	True	Contains information about Dynamic Redfish Extension.			
			Property Name	Type	Read Only	Description
			@odata.type	String	True	Refer Section 3.1
			DynamicExtension	Object	True	A reference to the Dynamic Extension. Note: Links will be available only when AMI OEM Host Interface feature is enabled in ASUS BMC Image in PRJ

3.5 Collection

Table 19 Collection Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “,How to Add OEM extensions” document.
Members	Array	True	Contains the members of this collection
Members@odata.count	Number	True	Collection members count.
Name	String	True	Name of the Collection
Description	String	True	Provides a description of the resource

3.6 Computer System Collection

This resource references a collection of links, each pointing to a Computer System resource instance.

3.6.1 GET

3.6.1.1 Request

GET `https://{ip}/redfish/v1/Systems`

Content-Type: application/json

3.6.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.6.2 POST

Client can create a new Computer System using the following Resource Blocks

- ComputeBlock
- NetworkBlock
- DrivesBlock

Note: For composing a system, an unused ResourceBlock link must be given under "ResourceBlocks" property.

3.6.2.1 Request

POST `https://{ip}/redfish/v1/Systems`

Content-Type: application/json

Example POST Request Body:

```
{
  "Name": "NewSystem",
  "Links":
  {
    "ResourceBlocks":
```

```

    [
      {"@odata.id":
        "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock" },
      {"@odata.id":
        "/redfish/v1/CompositionService/ResourceBlocks/DrivesBlock" }
    ]
  },
  "HostName" : "Intel"
}

```

3.6.2.2 Response

The response status is 201 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.7 Computer System

A computer system represents a machine (physical or virtual) and the local resources such as memory, CPU and other devices that can be accessed from that machine. Information on these resources or sub systems are also linked to this resource. This resource shall be used to represent resources that represent a computing system in the Redfish specification.

3.7.1 GET

3.7.1.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}

Content-Type: application/json

Note: Systems instance in BMC represents a single System and its id represented as Self.

For Eg: https://{{ip}}/redfish/v1/Systems/Self

3.7.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 20 ComputerSystem Properties

Name	Type	Read Only	Description	
@odata.context	String	True	Refer Section 3.1	
@odata.id	String	True	Refer Section 3.1	
@odata.type	String	True	Refer Section 3.1	
@odata.etag	String	True	Refer Section 3.1	
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according. "How to Add OEM extensions" document.	
Id (M)	String	True	Resource Identifier	
Name (M)	String	True	Name of the Resource	
Description	String	True	Provides description of the resource. Refer Section 3.3	
SystemType	String	True	An enumeration that indicates the kind of system that this resource represents.	
			Enum	Description
			Physical	A computer system
			Virtual	A virtual machine instance running on this system.
			OS	A computer system.
			PhysicallyPartitioned	A hardware-based partition of a computer system.
			VirtuallyPartitioned	A virtual or software-based partition of a computer system.
			Composed	A computer system that has been created by binding resource blocks together.
Links	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource	
			Property Name	Type

			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document
			Chassis(N)	Array	True	An array of references to the chassis in which this system is contained
			Chassis@odata.count	Number	True	An integer representing the number of items in a collection.
			Managed By(N)	Array	True	An array of references to the Managers responsible for this system.
			ManagedBy@odata.count	Number	True	An integer representing the number of items in a collection.
			Powered By(N)	Array	True	An array of ID[s] of resources that power this computer system. Normally the ID will be a chassis or a specific set of power Supplies. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Refer Platform Specific

						Properties Section in OEM Extension doc.
			PoweredBy@odata.count	Number	True	An integer representing the number of items in a collection.
			CooledBy (N)	Array	True	An array of ID[s] of resources that cool this computer system. Normally the ID will be a chassis or a specific set of fans. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Refer Platform Specific Properties Section in OEM Extension doc.
			CooledBy@odata.count	Number	True	An integer representing the number of items in a collection.
			Endpoints(N)	Array	True	An array of references to the endpoints that connect to this system. Note: These will be available only as a part of FPX Product.
			Endpoints@odata.count	Number	True	An integer representing the number of items in a collection.
AssetTag	String	True	The user definable tag that can be used to track this computer system for inventory or other client purposes. Default it will be			



			<p>null value</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>
Manufacturer	String	True	<p>Manufacturer or OEM of this system.</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>
Model	String	True	<p>Model number of this system.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Refer Platform Specific Properties “How to Add OEM extensions” document.</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>
SKU	String	True	<p>The value of this property shall contain the manufacturer Stock Keeping Unit (SKU) for the system.</p> <p>Note: This property will be populated by Host Interface, (Extra Bios Support is needed)</p>
SerialNumber	String	True	<p>The value of this property shall contain the serial number for this system.</p> <p>Note: This property will be populated by Host Interface, (Extra Bios Support is needed)</p>
PartNumber	String	True	<p>Part number for this system as defined by the manufacturer.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. How to Add OEM extensions document. This can be populated by Host Interface, (Extra Bios Support is needed)</p>
UUID	String	True	<p>The value of this property shall be used to contain a universal unique identifier number for the system. RFC4122 describes methods that can be used to create the value. The value should be considered to be opaque. Client software should</p>

			<p>only treat the overall value as a universally unique identifier and should not interpret any sub-fields within the UUID.</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>	
HostName	String	False	<p>The value of this property shall be the host name for this system, as reported by the operating system or hypervisor. This value is typically provided to the Manager by a service running in the host operating system. Default it will be null value</p> <p>Note: Northbound API is supported but still requires host interface and host agent support from host agent and in-band communication channel and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>	
IndicatorLED	String	False	<p>The value of this property shall contain the indicator light state for the indicator light associated with this system. Default it will be null value</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>	
			Enum	Description
			Unknown	The state of the Indicator LED cannot be determined.
			Lit	The Indicator LED is Lit.
			Blinking	The Indicator LED is Blinking.
			Off	The Indicator LED is Off.
PowerState	String	True	<p>The current power state of the system.</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>	
			Enum	Description
			On	The system is powered on.
			Off	The system is powered off, although some components may continue to have AUX power such as management controller.

			PoweringOn	A temporary state between Off and On. This temporary state can be very short.		
			PoweringOff	A temporary state between On and Off. The power off action can take time while the OS is in the shutdown process.		
Boot	Object	False	<p>This object shall contain properties which describe boot information for the current resource. Changes to this object do not alter the BIOS persistent boot order configuration. Refer Table 21 ComputerSystem – Boot Properties.</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>			
BiosVersion	String	True	<p>The version of the system BIOS or primary system firmware.</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>			
ProcessorSummary			<p>This object describes the central processors of the system in general detail.</p> <p>Note: This will be populated by Host Interface (Extra Bios Support is needed)</p>			
			Name	Type	Read Only	Description
			Count	Number	True	The number of processors in the system.
			Model	String	True	The processor model for the primary or majority of processors in this system.
			Status	Object	True	Refer Resource Complex Types under Section 3.3 . Note: Northbound only support
MemorySummary			<p>This object describes the central memory of the system in general detail.</p> <p>Note: This can be populated by Host Interface (Extra Bios Support is needed)</p>			

			Name	Type	Read Only	Description
			TotalSystemMemoryGiB	Number	True	The total installed, operating system-accessible memory (RAM), measured in GiB.
			Status	Object	True	Refer Resource Complex Types under Section 3.3 . Note: Northbound only support
			MemoryMirroring	String	True	The ability and type of memory mirroring supported by this system. It can take any of the following values:- System, DIMM, Hybrid, None. Note: Northbound only support
			Metrics	Object	True	The link to the metrics associated with all memory in this system. Note: This can be populated by Host Interface (Extra Bios Support is needed)
			TotalSystemPersistentMemoryGiB	Number	True	The total configured, system-accessible persistent memory, measured in GiB.
Actions	Object	True	ComputerSystem allow the user perform Reset Action and it's allowable values are as given in Section 3.3 . Please refer Reset enum type under Resource. It can also contain an Oem Object under Oem attribute under this Actions.			
Processors(N)	Object	True	A reference to the collection of Processors associated with this system.			
EthernetInterfaces(N)	Object	True	A reference to the collection of Ethernet interfaces associated with this system.			

SimpleStorage(N)	Object	True	A reference to the collection of storage devices associated with this system.
LogServices(N)	Object	True	A reference to the collection of Log Services associated with this system.
Status	Object	True	Please refer Section 3.3 for Resource Status. Note: This can be populated by Host Interface (Extra Bios Support is needed)
TrustedModules	Array	True	This object describes the array of Trusted Modules in the system. Note: This can be populated by Host Interface (Extra Bios Support is needed)
SecureBoot(N)	Object	True	A reference to the UEFI SecureBoot resource associated with this system. Note: This can be populated by Host Interface (Extra Bios Support is needed)
Bios(N)	Object	True	A reference to the BIOS settings associated with this system. Note: This link will be populated only if corresponding BIOS module is present.
Memory(N)	Object	True	A reference to the collection of Memory associated with this system.
Storage(N)	Object	True	A reference to the collection of storage devices associated with this system. Note: Northbound API is supported but still requires host interface and host agent support from host agent and in-band communication channel and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
NetworkInterfaces(N)	Object	True	A reference to the collection of Network Interfaces associated with this system. Note: This link will be populated only if corresponding BIOS module is present.
HostingRoles	Array	True	The hosing roles that this computer system supports.
			Enum

			ApplicationServer	The system hosts functionality that supports general purpose applications.
			StorageServer	The system hosts functionality that supports the system acting as a storage server.
			Switch	The system hosts functionality that supports the system acting as a switch.
HostedServices	Object	True	<p>The services that this computer system supports.</p> <p>Note: At present only Oem property is supported under it. Refer Resource Complex Types under Section 3.3.</p> <p>Note: It will be present in response if there is an oem property Implemented according to “How to Add OEM extensions” document</p>	
PCIeDevices (N)	Object	True	<p>A reference to a collection of PCIe Devices used by this computer system.</p> <p>Note: Links will be available only when Host Interface feature is enabled and the corresponding ASUS BIOS Image is used.</p>	
PCIeFunctions (N)	Object	True	<p>A reference to a collection of PCIe Functions used by this computer system.</p> <p>Note: Links will be available only Host Interface feature is enabled and the corresponding ASUS BIOS Image is used.</p>	
PowerRestorePolicy	String	False	This property shall indicate the desired PowerState of the system when power is applied to the system.	
			Enum	Description
			AlwaysOn	The system will always power on when power is applied.
			AlwaysOff	The system will always remain powered off when power is applied.
			LastState	The system will return to its last power state (on or off) when power is applied.

This object shall contain properties which describe boot information for the current resource. Changes to this object do not alter the BIOS persistent boot order configuration.

Note:

BootSourceOverrideTarget is set to a default value of "None" and can be changed only when the data is sent from BIOS (BIOS should support Redfish) or set by end-user using PATCH request (Enum values are selectively patchable with respect to Redfish support in BIOS).

This can also be populated by Host Interface, (Extra Bios Support is needed)

The Allowable values only shows the values that are supported by IPMI by default so that syncing with IPMI will work. If it is detected that BIOS sent the AttributeRegistry file, then it is assumed that BIOS has support for using the Redfish boot options and the syncing with IPMI is disabled.

IPMI default support - None, Pxe, Floppy, Cd, Usb, Hdd, BiosSetup and Diags
UefiTargetBootSourceOverride will not be displayed by default and can be changed only when the data is sent from BIOS (BIOS should support Redfish) or set by end-user using PATCH request. Until then it is acceptable to have it not displayed and the "SelectList" part of odata.context can be omitting it in order to be a valid response.

This can also be populated by Host Interface, (Extra Bios Support is needed)

Table 21 ComputerSystem – Boot Properties

Name	Type	Read Only	Description																
BootOptions	Object	True	<p>A reference to the collection of the UEFI Boot Options associated with this Computer System.</p> <p>Note: This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section 10 for detailed information)</p>																
CertificateService	Object	True	A reference to the collection of the CertificateServices																
BootNext	String	False	<p>This property is the BootOptionReference of the Boot Option to perform a one time boot from when BootSourceOverrideTarget is UefiBootNext. Default it will be null value</p> <p>User needs to patch this property and BIOS will read it in the next boot and apply provided ASUS BIOS is used.</p> <p>Note: This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section 10 for detailed information)</p>																
BootSourceOverrideTarget	String	False	<p>The current boot source to be used at next boot instead of the normal boot device, if BootSourceOverrideEnabled is true. Default it will be null value</p> <p>The allowable values for this property are specified in the following table :-</p> <table border="1"> <thead> <tr> <th>Enum</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>None</td> <td>Boot from the normal boot device.</td> </tr> <tr> <td>Pxe</td> <td>Boot from the Pre-Boot Execution (PXE) environment.</td> </tr> <tr> <td>Floppy</td> <td>Boot from the floppy disk drive.</td> </tr> <tr> <td>Cd</td> <td>Boot from the CD/DVD disc.</td> </tr> <tr> <td>Usb</td> <td>Boot from a USB device as specified by the system BIOS</td> </tr> <tr> <td>Hdd</td> <td>Boot from a hard drive</td> </tr> <tr> <td>BiosSetup</td> <td>Boot to the BIOS Setup Utility.</td> </tr> </tbody> </table>	Enum	Description	None	Boot from the normal boot device.	Pxe	Boot from the Pre-Boot Execution (PXE) environment.	Floppy	Boot from the floppy disk drive.	Cd	Boot from the CD/DVD disc.	Usb	Boot from a USB device as specified by the system BIOS	Hdd	Boot from a hard drive	BiosSetup	Boot to the BIOS Setup Utility.
Enum	Description																		
None	Boot from the normal boot device.																		
Pxe	Boot from the Pre-Boot Execution (PXE) environment.																		
Floppy	Boot from the floppy disk drive.																		
Cd	Boot from the CD/DVD disc.																		
Usb	Boot from a USB device as specified by the system BIOS																		
Hdd	Boot from a hard drive																		
BiosSetup	Boot to the BIOS Setup Utility.																		

			Utilities	<p>Boot the manufacturer’s Utilities program(s).</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			Diags	<p>Boot the manufacturer’s Diagnostics program.</p>
			UefiShell	<p>Boot to the UEFI Shell.</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			UefiTarget	<p>Boot to the UEFI Device specified in the UefiTargetBootSourceOverride property</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			SDCard	<p>Boot from an SD Card.</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			UefiHttp	<p>Boot from a UEFI HTTP network location.</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			RemoteDrive	<p>Boot from a remote drive (e.g. iSCSI).</p> <p>Note: This property is patchable only when BIOS supports Redfish and</p>

				BIOS should send this property to BMC at BIOS Boot.								
			UefiBootNext	<p>Boot to the UEFI Device specified in the BootNext property.</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>								
BootSourceOverrideEnabled	String	False	<p>The value of this property shall be Once if this is a one time boot override and Continuous if this selection should remain active until cancelled. If the property value is set to Once, the value will be reset back to Disabled after the BootSourceOverrideTarget actions have been completed. Default it will be null value</p> <table border="1"> <thead> <tr> <th>Enum</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Disabled</td> <td>The system will boot normally.</td> </tr> <tr> <td>Once</td> <td>On its next boot cycle, the system will boot (one time) to the Boot Source Override Target. The value of BootSourceOverrideEnabled is then reset back to Disabled.</td> </tr> <tr> <td>Continuous</td> <td>The system will boot to the target specified in the BootSourceOverrideTarget until this property is set to Disabled</td> </tr> </tbody> </table>		Enum	Description	Disabled	The system will boot normally.	Once	On its next boot cycle, the system will boot (one time) to the Boot Source Override Target. The value of BootSourceOverrideEnabled is then reset back to Disabled.	Continuous	The system will boot to the target specified in the BootSourceOverrideTarget until this property is set to Disabled
Enum	Description											
Disabled	The system will boot normally.											
Once	On its next boot cycle, the system will boot (one time) to the Boot Source Override Target. The value of BootSourceOverrideEnabled is then reset back to Disabled.											
Continuous	The system will boot to the target specified in the BootSourceOverrideTarget until this property is set to Disabled											
UefiTargetBootSourceOverride	String	False	<p>The value of this property shall be the UEFI device path of the override boot target. The valid values for this property are specified through the Redfish.AllowableValues annotation.</p> <p>BootSourceOverrideEnabled = Continuous is not supported for UEFI Boot Source Override as this setting is defined in UEFI as a one time boot only. Default it will be null value</p>									
AliasBootOrder	Array	True	<p>Ordered array of boot source aliases representing the persistent Boot Order associated with this computer system.</p> <p>Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>									

BootOrder	Array	False	Ordered array of BootOptionReference strings representing the persistent Boot Order associated with this computer system. Default it will be null value	
BootOrderPropertySelection	String	True	The value of this property shall indicate which boot order property the system uses when specifying the persistent boot order.	
BootSourceOverrideMode	String	False	The value of this property shall be Legacy for non-UEFI BIOS boot or UEFI for UEFI boot from boot source specified in BootSourceOverrideTarget property.	
			Enum	Description
			Legacy	The system will boot in non-UEFI boot mode to the Boot Source Override Target.
			UEFI	The system will boot in UEFI boot mode to the Boot Source Override Target.

Table 22 Computer system – MemorySummary – MemoryMirroringEnum Properties

Enum	Description
System	The system supports DIMM mirroring at the System level. Individual DIMMs are not paired for mirroring in this mode.
DIMM	The system supports DIMM mirroring at the DIMM level. Individual DIMMs can be mirrored.
Hybrid	The system supports a hybrid mirroring at the system and DIMM levels. Individual DIMMs can be mirrored.
None	The system does not support DIMM mirroring.

Table 23 TrustedModules Properties

This object describes the inventory of a Trusted Modules installed in the system.

Name	Type	Read Only	Description	
FirmwareVersion	String	True	The firmware version of this Trusted Module.	
InterfaceType	String	True	This property indicates the interface type of the Trusted Module.	
			Enum	Description
			TPM1_2	Trusted Platform Module (TPM) 1.2.
			TPM2_0	Trusted Platform Module (TPM) 2.0.
			TCM1_0	Trusted Cryptography Module (TCM) 1.0.
Status	String	True	Please refer Section 3.3 for Resource.Status. Note: This can be populated by Host Interface (Extra Bios Support is needed)	
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “How to Add OEM extensions”document	
FirmwareVersion2	String	True	The 2nd firmware version of this Trusted Module, if applicable.	
InterfaceTypeSelection	String	True	The Interface Type selection supported by this Trusted Module.	
			Enum	Description
			None	The TrustedModule does not support switching the InterfaceType.
			FirmwareUpdate	The TrustedModule supports switching InterfaceType via a firmware update.
			BiosSetting	The TrustedModule supports switching InterfaceType via platform software, such as a BIOS configuration Attribute.

			OemMethod	The TrustedModule supports switching InterfaceType via an OEM proprietary mechanism.
--	--	--	-----------	--

3.7.2 PATCH

3.7.2.1 Request

PATCH https://{{ip}}/redfish/v1/Systems/{{system_instance}}

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in

Table 20 ComputerSystem Properties for which ReadOnly is False that can be sent as Request body in json format.

Example PATCH Request Body:

```
{
  "Boot":
  {
    "BootSourceOverrideEnabled": "Continuous",
    "BootSourceOverrideTarget": "Usb",
    "UefiTargetBootSourceOverride": "UEFI device path 2"
  }
}
```

3.7.2.2 *Response*

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note : Out-Of-Band PATCH for the System instances will be blocked during the Host System Booting until the inventory is processed by the redfish service and the request will respond with status code 503 and Service Not Available message.

3.7.3 POST

3.7.3.1 Request

The ResetType can be one of the following values: "On", "ForceOff", "GracefulShutdown", "ForceRestart".

POST `https://{{ip}}/redfish/v1/Systems/Self/Actions/ComputerSystem.Reset`

Content-Type: application/json

Example POST Request Body:

```
{
  "ResetType": "On"
}
```

3.7.3.2 Response

For success the response status is 202 with message body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

```
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task(TaskState,Description,Name,Id)",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_2.Task",
  "Description": "Task for Computer Reset",
  "Id": "1",
  "Name": "Computer Reset",
  "TaskState": "New"
}
```

Note:

After successful post call, please allow 5 seconds and verify the value of PowerState property in /redfish/v1/Systems/Self instance. Using TaskID check the TaskStatus. Using MaintenanceWindowStartTime if Task is Cancelled due to invalid state Action then showing error message in Corresponding Tasks Using TaskID check the TaskStatus.

For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.8 BootOption Collection

It displays a list of BootOption instances. This represents the collection of BootOption resources.

Note: In BMC, BootOption Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.8.1 GET

3.8.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/BootOptions

Content-Type: application/json

3.8.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.9 BootOption

Displays the information about the BootOptions.

Note: In BMC, BootOptions Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.9.1 GET

3.9.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/BootOptions/{{BootOptions_instance}}

Content-Type: application/json

3.9.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 24 BootOption Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Actions	Object	True	The available actions for this Resource.
BootOptionEnabled	Boolean	false	An indication of whether the boot option is enabled. Default it will be null value
BootOptionReference	String	True	The unique boot option.
DisplayName	String	True	The user-readable display name of the boot option that appears in the boot order list in the user interface.
RelatedItem	Array	True	An array of one or more IDs for the Resources associated with this boot option.
RelatedItem@odata.count	Number	True	Number of RelatedItems
UefiDevicePath	String	True	The UEFI device path to access this UEFI Boot Option.
Alias			The alias of this boot source.
	Enum		Description
	None		Boot from the normal boot device.
	Pxe		Boot from the Pre-Boot Execution (PXE) environment.

			Floppy	Boot from the floppy disk drive.
			Cd	Boot from the CD/DVD disc.
			Usb	Boot from a USB device as specified by the system BIOS
			Hdd	Boot from a hard drive
			BiosSetup	Boot to the BIOS Setup Utility.
			Utilities	<p>Boot the manufacturer's Utilities program(s).</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			Diags	Boot the manufacturer's Diagnostics program.
			UefiShell	<p>Boot to the UEFI Shell.</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			UefiTarget	<p>Boot to the UEFI Device specified in the UefiTargetBootSourceOverride property</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			SDCard	<p>Boot from an SD Card.</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			UefiHttp	<p>Boot from a UEFI HTTP network location.</p> <p>Note: This property is patchable only when BIOS supports Redfish and</p>

				BIOS should send this property to BMC at BIOS Boot.
			RemoteDrive	<p>Boot from a remote drive (e.g. iSCSI).</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>
			UefiBootNext	<p>Boot to the UEFI Device specified in the BootNext property.</p> <p>Note: This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</p>

3.9.2 PATCH

3.9.2.1 Request

PATCH https://{{ip}}/redfish/v1/Systems/Self/BootOptions/{{BootOptions_instance}}

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in

Table 20 ComputerSystem Properties for which ReadOnly is False that can be sent as Request body in json format.

Example PATCH Request Body:

```
{  
  BootOptionEnabled:true  
}
```

3.9.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note : Out-Of-Band PATCH for the System instances will be blocked during the Host System Booting until the inventory is processed by the redfish service and the request will respond with status code 503 and Service Not Available message.

3.10 Memory Collection

It displays a list of Memory instances. This represents the collection of Memory resources.

Note: In BMC, Memory Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.10.1 GET

3.10.1.1 Request

`https://{{ip}}/redfish/v1/Systems/Self/Memory`

Content-Type: application/json

3.10.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.11 Memory

Displays the information about the Memory devices like DIMM supported by the host connected to the BMC.

Note: In BMC, Memory Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.11.1 GET

3.11.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/Memory/{{Memory_instance}}

Content-Type: application/json

3.11.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 25 Memory Properties

Name	Type	Read Only	Description				
@odata.context	String	True	Refer Section 3.1				
@odata.id	String	True	Refer Section 3.1				
@odata.type	String	True	Refer Section 3.1				
@odata.etag	String	True	Refer Section 3.1				
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document				
Id(M)	String	True	Resource Identifier				
Name(M)	String	True	Name of the Resource				
Description	String	True	Provides description of the resource. Refer Section 3.3				
MemoryType	String	True	The Type of Memory. Note: Platform specific porting needed in BIOS. Purley platform supports this SMBIOS data and BIOS provides MemoryType only when "Extended Type 17 Structure" enabled in BIOS.				
			<table border="1"> <thead> <tr> <th>Enum</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Enum	Description		
Enum	Description						

			DRAM	DRAM
			NVDIMM_N	NVDIMM_N as defined by JEDEC.
			NVDIMM_F	NVDIMM_F as defined by JEDEC.
			NVDIMM_P	NVDIMM_P as defined by JEDEC.
			IntelOptane	The memory module is Intel Optane DC Persistent Memory and composed of a combination of non-volatile and volatile memory.
MemoryDeviceType	String	True	Type details of Memory. Allowable values are : [“DDR”, “DDR2”, “DDR3”, “DDR4”, “DDR4_SDRAM”, “DDR4E_SDRAM”, “LPDDR4_SDRAM”, “DDR3_SDRAM”, “LPDDR3_SDRAM”, “DDR2_SDRAM”, “DDR2_SDRAM_FB_DIMM”, “DDR2_SDRAM_FB_DIMM_PROBE”, “DDR_SGRAM”, “DDR_SDRAM”, “ROM”, “SDRAM”, “EDO”, “FastPageMode”, “PipelinedNibble”, “Logical”]	

BaseModule Type	String	True	The base module type of Memory. Note: Northbound only properties.	
			Enum	Description
			RDIMM	Registered DIMM.
			UDIMM	UDIMM
			SO_DIMM	SO_DIMM
			LRDIMM	Load Reduced
			Mini_RDIMM	Mini_RDIMM
			Mini_UDIMM	Mini_UDIMM
			SO_RDIMM_72b	SO_RDIMM_72b
			SO_UDIMM_72b	SO_UDIMM_72b
			SO_DIMM_16b	SO_DIMM_16b
			SO_DIMM_32b	SO_DIMM_32b
MemoryMedia	Array	True	Media of this memory. Note: Northbound only properties.	
			Enum	Description
			DRAM	DRAM media.
			NAND	NAND media.
			Proprietary	Proprietary media.
CapacityMiB	Number	True	The value of this property shall be the Memory capacity in MiB	
DataWidthBits	Number	True	The value of this property shall be the bus width in bits	
BusWidthBits	Number	True	The value of this property shall be the bus width in bits	
Manufacturer	String	True	The manufacturer of the Memory.	
SerialNumber	String	True	The serial number as provided by the manufacturer of this Memory.	
PartNumber	String	True	The part number as provided by the manufacturer of this Memory.	
AllowedSpeedsMHz	Array	True	Speed bins supported by this Memory.	

FirmwareRevision	String	True	Revision of firmware on the Memory controller. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.			
FirmwareApiVersion	String	True	Version of API supported by the firmware. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.			
FunctionClasses	Array of Items of type String	True	Function Classes by the Memory. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.			
MaxTDPMilliWatts	Array of type number	True	The value of this property shall be the maximum power budgets supported by the Memory in milli Watts. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.			
SecurityCapabilities	Object	True	This object shall contain properties which describe the security capabilities of the Memory.			
			Name	Type	Read Only	Description
			PassphraseCapable	Boolean	True	Memory passphrase set capability
			MaxPassphraseCount	Number	True	Maximum number of passphrases supported for this Memory.
			PassphraseLockLimit	Number	True	Maximum number of incorrect passphrase attempts allowed before memory is locked.
			ConfigurationLockCapable	Boolean	True	Support for locking the configuration.

			DataLockCapable	Boolean	True	Support for data locking.
SpareDeviceCount	Number	True	The value of this property shall be the number of unused spare devices available in the Memory. If memory devices fails, the spare device could be used.			
ConfigurationLocked	Boolean	True	Indicates that the configuration of this memory has been locked.			
RankCount	Number	True	The value of this property shall be number of ranks available in the Memory. The ranks could be used for spare or interleave. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.			
DeviceLocator	String	True	Location of the Memory in the platform, typically marked in the silk screen.			
MemoryLocation			Memory connection information to sockets and memory controllers. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.			
			Name	Type	Read Only	Description
			Socket	Number	True	Socket number in which Memory is connected.
			MemoryController	Number	True	Memory controller number in which Memory is connected.
			Channel	Number	True	Channel number in which Memory is connected.
			Slot	Number	True	Slot number in which Memory is connected.
ErrorCorrection	String	True	The value of this property shall be the error correction scheme supported for this memory.			
			Enum	Description		

			NoECC	No ECC available.																		
			SingleBitECC	Single bit Data error can be corrected by ECC																		
			MultiBitECC	Multi-bit Data errors can be corrected by ECC.																		
			AddressParity	Address Parity errors can be corrected.																		
OperatingSpeedMhz	Number	True	Operating speed of Memory in MHz																			
VolatileRegionSizeLimitMiB	Number	True	<p>The value of this property shall be the total size of volatile regions in MiB.</p> <p>Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>																			
PersistentRegionSizeLimitMiB	Number	True	<p>The value of this property shall be the total size of persistent regions in MiB.</p> <p>Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>																			
Regions	Array		<p>The value of this property shall be the memory region information within the Memory.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read Only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>RegionId</td> <td>String</td> <td>True</td> <td>Unique region ID representing a specific region within the Memory</td> </tr> <tr> <td>OffsetMiB</td> <td>Number</td> <td>True</td> <td>Offset with in the Memory that corresponds to the starting of this memory region in MiB</td> </tr> <tr> <td>Passphrase Enabled</td> <td>Boolean</td> <td>True</td> <td>The value of this property shall be a boolean indicating if the passphrase is enabled for this region.</td> </tr> </tbody> </table>				Name	Type	Read Only	Description	RegionId	String	True	Unique region ID representing a specific region within the Memory	OffsetMiB	Number	True	Offset with in the Memory that corresponds to the starting of this memory region in MiB	Passphrase Enabled	Boolean	True	The value of this property shall be a boolean indicating if the passphrase is enabled for this region.
Name	Type	Read Only	Description																			
RegionId	String	True	Unique region ID representing a specific region within the Memory																			
OffsetMiB	Number	True	Offset with in the Memory that corresponds to the starting of this memory region in MiB																			
Passphrase Enabled	Boolean	True	The value of this property shall be a boolean indicating if the passphrase is enabled for this region.																			



			SizeMiB	Number	True	Size of this memory region in MiB.				
			MemoryClassification	String	True	Enum	Description			
						Volatile	Volatile memory			
						ByteAccessiblePersistent	Byte accessible persistent memory			
						Block	Block accessible memory			
OperatingMemoryModes	Array	True	The value of this property shall be the memory modes supported by the Memory.							
			Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.							
			Enum		Description					
			Volatile		Volatile memory.					
			PMEM		Persistent memory, byte accessible through system address space.					
Block		Block accessible system memory.								
PowerManagementPolicy	Object	True	This object shall contain properties which describe the power management policy for the current resource.							
			Name	Type	Read Only	Description				
			PolicyEnabled	Boolean	True	Power management policy enabled status.				
			MaxTDPMilliWatts	Number	True	Maximum TDP in milli watts.				
			PeakPowerBudgetMilliWatts	Number	True	Peak power budget in milli watts.Unit is mW.				

			AveragePowerBudgetMilliWatts	Number	True	Average power budget in milli watts. Unit is mW.
IsSpareDeviceEnabled	Boolean	True	Spare device enabled status.			
IsRankSpareEnabled	Boolean	True	Rank spare enabled status.			
VolatileRegionNumberLimit	Number	True	Total number of volatile regions this Memory can support.			
PersistentRegionNumberLimit	Number	True	Total number of persistent regions this Memory can support.			
VolatileRegionSizeMaxMiB	Number	True	Maximum size of a single volatile region in MiB			
PersistentRegionSizeMaxMiB	Number	True	Maximum size of a single persistent region in MiB			
AllocationIncrementMiB	Number	True	The size of the smallest unit of allocation for a memory region, thus it is the multiple in which regions are actually reserved			
AllocationAlignmentMiB	Number	True	The boundary which memory regions are allocated on, measured in MiB			
Links	Object		Contains references to other resources that are related to this resource.			
			Name	Type	Read Only	Description
			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document

			Chassis(N)	Array	True	A reference to the Chassis which contains this Memory.
Status	Object		Name	Type	Read Only	Description
			Oem	Object		Refer Section 3.3 for Links under Resource Complex Types.
			OriginOfCondition	Object	True	This is the URI of the resource that caused the log entry. Refer idRef in odata4.0.0.json.
ModuleManufacturerID	String	True	The value of this property shall be the two byte manufacturer ID of this memory module as defined by JEDEC in JEP-106.			
ModuleProductID	String	True	The value of this property shall be the two byte product ID of this memory module as defined by the manufacturer.			
MemorySubsystemControllerManufacturerID	String	True	The value of this property shall be the two byte manufacturer ID of the memory subsystem controller of this memory module as defined by JEDEC in JEP-106.			
MemorySubsystemControllerProductID	String	True	The value of this property shall be the two byte product ID of the memory subsystem controller of this memory module as defined by the manufacturer.			
VolatileSizeMiB	Number	True	The value of this property shall be the total size of the volatile portion memory in MiB.			
NonVolatileSizeMiB	Number	True	The value of this property shall be the maximum size of a single volatile regions in MiB.			
CacheSizeMiB	Number	True	The value of this property shall be the total size of the cache portion memory in MiB.			
LogicalSizeMiB	Number	True	The value of this property shall be the total size of the logical memory in MiB.			
Location (M)	Array	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource.Location.			

Metrics(N)	Object	True	<p>This property will have reference to the MemoryMetrics Resource which is populated under this MemoryInstance.</p> <p>Note: For out-of-band request this Metrics reference will be displayed in response only if the MemoryMetrics is populated for the MemoryInstance and for in-band request it will be displayed by default irrespective of MemorMetrics availability for the MemoryInstance.</p>
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Table 26 SecurityStates

Enum	Description
Enabled	Secure mode is enabled.
Disabled	Secure mode is disabled.
Unlocked	Secure mode is enabled and access to the data is unlocked.
Locked	Secure mode is enabled and access to the data is locked.
Frozen	Secure state is frozen and cannot be modified until reset.
Passphraselimit	Number of attempts to unlock the Memory exceeded limit.
Volatile	Volatile Memory
ByteAccessiblePersistent	Byte accessible persistent memory.
Block	Block accessible memory.

3.11.2 POST

POST Action for Memory Instance AmiBios.ChangeState will be available only with HostInterface support in Redfish

3.11.2.1 Request

POST https://{{ip}}/redfish/v1/Systems/{{Systems_instance}}/Memory/{{memory_instance}}/Actions/AmiBiosChangeState

Content-Type: application/json

Example POST Request URL

https://{{ip}}/redfish/v1/Systems/Self/Memory/{{Mem_instance}}/Actions/AmiBios.ChangeState

Example POST Request Body:

```
{  
  "State": "Disabled"  
}
```

Note: If all the memory instances are disabled, the Host System will not bootup in the next boot.

Please refer “MegaRAC Redfish - BMC Hardware Health Management Getting Started Guide” for more detailed test cases.

3.11.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.12 ProcessorCollection

It displays a list of Processor instances in the ComputerSystem(Host).

Note: In BMC, Processor Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.12.1 GET

3.12.1.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Processors

or

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Processors/{{system_processor_instance}}/SubProcessors

Content-Type: application/json

3.12.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.13 Processor

This is the schema definition for the Processor resource. It represents the properties of a processor attached to a System.

Note: In BMC, Processor Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.13.1 GET

3.13.1.1 Request

`https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Processors/{{system_processor_instance}}`

or

`https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Processors/{{system_processor_instance}}/SubProcessors/{{sub_processor_instance}}`

Content-Type: application/json

3.13.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Note: The properties applicable for each instances depends on the ProcessorType value(like Processor instance of Processor Type Cores won't have property, Processor instance of ProcessorType won't have ToatlCores and TotalThreads proeprties).

Table 27 Processor Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 .

			Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM Extensions” document.			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Socket	String	True	Identifies the physical location or socket of the processor.			
Status	Object	True	Name	Type	Read Only	Description
			State	String	True	Refer Section 3.3 Resource Enum Types Note: State can be changed through AmiBios.ChangeState Action. Refer Section 6.3 for Memory Action.
			Health	String	True	Refer Section 3.3 Resource Enum Types. Note: Health Status is "OK" if processor is populated. Health value will be affected/changed through Sensor related logs as explained in detail in “How to Add OEM extensions” document.
ProcessorType	String	True	Identifies the type of processor contained in this Socket.			
			Enum		Description	
			CPU		A Central Processing Unit.	
			GPU		A Graphics Processing Unit.	
			FPGA		A Field Programmable Gate Array.	
			DSP		A Digital Signal Processor.	
			Accelerator		An Accelerator	

			OEM	An OEM-defined Processing Unit.		
			Core	A Core in a Processor.		
			Thread	A Thread in a Processor.		
ProcessorArchitecture	String	True	Identifies the architecture of the processor contained in this Socket			
			Enum	Description		
			x86	x86 or x86-64		
			IA-64	Intel Itanium.		
			ARM	ARM		
			MIPS	MIPS		
			OEM	OEM-defined		
InstructionSet	String	True	This property shall contain the string which identifies the instruction set of the processor contained in this socket. Note: Northbound only supported.			
			Enum	Description		
			x86	x86 32-bit		
			x86-64	x86 64-bit		
			IA-64	Intel IA-64		
			ARM-A32	ARM 32-bit		
			ARM-A64	ARM 64-bit		
			MIPS32	MIPS 32-bit		
			MIPS64	MIPS 64-bit		
			OEM	OEM-defined		
ProcessorId	Object		This object shall contain identification information for this processor.			
			Name	Type	Read only	Description
			VendorId	String	True	This property shall indicate the Vendor Identification string information as provided by the

						manufacturer of this processor.
			IdentificationRegisters	String	True	The contents of the Identification Registers (CPUID) for this processor.
			EffectiveFamily	String	True	The effective Family for this processor
			EffectiveModel	String	True	This property shall indicate the effective Model information as provided by the manufacturer of this processor.
			Step	String	True	This property shall indicate the Step or revision string information as provided by the manufacturer of this processor.
			MicrocodeInfo	String	True	This property shall indicate the Microcode Information as provided by the manufacturer of this processor.
Manufacturer	String	True	The manufacturer of the processor			
Model	String	True	This property shall indicate the model information as provided by the manufacturer of this processor.			
MaxSpeedMHz	Number	True	The maximum clock speed of the processor.			
TotalCores	Number	True	The total count of independent processor cores contained within this processor.			
TotalThreads	Number	True	The total count of independent execution threads supported by this processor.			
Links	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource			
			Name	Type	Read Only	Description

			Oem	Object	False	Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document”
			Chassis(N)	Array	True	The value of this property shall be a reference to a resource of type Chassis that represent the physical container associated with this Processor.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			
SubProcessors	Object	True	The value of this property shall be a link to a collection of type ProcessorCollection. Refer section 3.12 ProcessorCollection .			
Location	Object	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource.Location. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.			
Acceleration Functions(N)	Object	True	A reference to the collection of Acceleration Functions associated with this Processor.			
MaxTDPWatts	Number	True	The maximum Thermal Design Power (TDP) in watts.			
Metrics(N)	Object	True	A reference to the Metrics associated with this Processor.			
TDPWatts	Number	True	The nominal Thermal Design Power (TDP) in watts.			
TotalEnabled Cores	Number	True	The total number of enabled cores contained in this processor.			
UUID	String	True	The universal unique identifier (UUID) for this processor.			

FPGA	Object	True	The properties specific for Processors of type FPGA. Refer Table 27 Processor Properties			
ProcessorMemory	Array	True	The memory directly attached or integrated within this Processor.			
			Name	Type	Read Only	Description
			CapacityMiB	Number	True	The memory capacity in MiB.
			IntegratedMemory	Boolean	True	This indicates whether this memory is integrated within the Processor.
			MemoryType	String	True	The type of memory used by this processor. Refer Table 28 Enum values of Memory Type
			SpeedMHz	Number	True	The operating speed of the memory in MHz.

Table 28 Enum values of Memory Type

Enum	Description
DDR	Double data rate synchronous dynamic random-access memory
DDR2	Double data rate type two synchronous dynamic random-access memory
DDR3	Double data rate type three synchronous dynamic random-access memory
DDR4	Double data rate type four synchronous dynamic random-access memory
DDR5	Double data rate type five synchronous dynamic random-access memory
Flash	Flash memory
GDDR	Synchronous graphics random-access memory
GDDR2	Double data rate type two synchronous graphics random-access memory



GDDR3	Double data rate type three synchronous graphics random-access memory
GDDR4	Double data rate type four synchronous graphics random-access memory
GDDR5	Double data rate type five synchronous graphics random-access memory
GDDR5X	Double data rate type five synchronous graphics random-access memory
GDDR6	Double data rate type five synchronous graphics random-access memory
HBM1	High Bandwidth Memory
HBM2	The second generation of High Bandwidth Memory
HBM3	The third generation of High Bandwidth Memory
L1Cache	L1 cache
L2Cache	L2 cache
L3Cache	L3 cache
L4Cache	L4 cache
L5Cache	L5 cache
L6Cache	L6 cache
L7Cache	L7 cache
OEM	OEM-defined
SDRAM	Synchronous dynamic random-access memory
SGRAM	Synchronous graphics RAM
SRAM	Static random-access memory

Table 29 Property table of FPGA

Name	Type	Read Only	Description
FirmwareId	String	True	The value of this property shall contain a string describing the FPGA firmware identifier.
FirmwareManufacturer	String	True	The FPGA firmware manufacturer.

FirmwareVersion	String	True	The FPGA firmware version.			
FpgaType	String	True	The value of this property shall be a type of the FPGA device.			
			Enum	Description		
			Discrete	The discrete FPGA device.		
			Integrated	The FPGA device integrated with other processor in the single chip.		
Model	String	True	The value of this property shall be a model of the FPGA device.			
PCleVirtualFunctions	Number	True	The number of the PCIe Virtual Functions.			
ProgrammableFromHost	Boolean	True	This flag indicates if the FPGA firmware can be reprogrammed from the host using system software.			
ReconfigurationSlots	Array	True	An array of the FPGA reconfiguration slots. A reconfiguration slot is used by an FPGA to contain an acceleration function that can change as the FPGA is being provisioned.			
			Name	Type	Read Only	Description
			AccelerationFunction	Object	True	A link to the Acceleration Function provided by the code programmed into a reconfiguration slot.
			ProgrammableFromHost	Boolean	True	This flag indicates if the reconfiguration slot can be reprogrammed from the host using system software.
			SlotId	String	True	The FPGA reconfiguration slot identifier.
			UUID	String	True	The universal unique identifier (UUID) for this reconfiguration slot.
HostInterface	Object	True	The FPGA interface to the host. Refer Table 30 Property table of FPGA interface			

ExternalInterfaces	Array	True	An array of the FPGA external interfaces. Refer Table 30 Property table of FPGA interface
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Table 30 Property table of FPGA interface

Name	Type	Read Only	Description			
Ethernet	Object	True	Describes the Ethernet related information about this FPGA interface.			
			Name	Type	Read Only	Description
			MaxLanes	Number	True	This is the number of lanes supported by this interface.
			MaxSpeedMbps	Number	True	The maximum speed supported by this interface.
InterfaceType	String	True	The FPGA interface type.			
			Enum	Description		
			Ethernet	An Ethernet interface.		
			OEM	An OEM defined interface.		
			PCIe	A PCI Express interface.		
			QPI	The Intel QuickPath Interconnect.		
PCIe	Object	True	Describes the PCI-e related information about this FPGA interface. Refer Table 99 PCIeInterface Properties			

3.14 Ethernet Interface Collection

3.14.1 Systems

This resource shall be used to represent the collection of host side NIC resources. This requires host agent support from OS and in-band communication channel.



Note: In BMC, Ethernet Interfaces Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.14.2 Managers

This resource shall be used to represent the collection of NIC resources in the manager.

3.14.2.1 Get

3.14.2.1.1 Request

`https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces`

Content-Type: application/json

3.14.2.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

Note:

If `{{manager_ethifc_instance}}` like eth0,bond0 etc, then only the following minimal properties will be shown in the response:-

Id, Name, MACAddress & Ipv4Addresses along with Odata Properties

Manager Ethernet Interface typically supports at max one VLAN per interface for a single BMC.

3.15 EthernetInterface

3.15.1 Systems

This resource shall be used to represent host side NIC resources. This requires host agent support from OS and in-band communication channel.

Note: In BMC, Ethernet Interfaces Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.15.1.1 GET - EthernetInterface Instance

3.15.1.1.1 Request for EthernetInterface Instance

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/
{{system_ethifc_instance}}

Content-Type: application/json

3.15.1.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Note: System Ethernet Interface typically supports at max one VLAN per interface for a single BMC.

Table 31 Ethernet Interface Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
UefiDevicePath	String	True	The UEFI device path for this interface (port). Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Manager EthernetInterface under Platform specific Properties in “How to Add OEM extensions” document.
Status	Object	True	Refer Section 3.3 for Status under Resource Complex Types.

InterfaceEnabled	Boolean	False	This indicates whether this interface is enabled.			
PermanentMACAddress	String	True	The value of this property shall be the Permanent MAC Address of this interface (port). This value is typically programmed during the manufacturing time. This address is not assignable.			
MACAddress	String	True	<p>The value of this property shall be the effective current MAC Address of this interface. If an assignable MAC address is not supported, this is a read only alias of the PermanentMACAddress</p> <p>Note: Eventhough the ReadOnly attribute in Redfish schema for managers is specified as "False", In Redfish API, patching MACAddress is not allowed. Changing MACAddress will change the IP address and if user is using redfish in remote with no access to host/BMC, it will be an issue in obtaining new IP address and also change in MACAddress could result in mac address collision if there is a device on the local network with the same mac address.</p>			
Ipv4Addresses	Array of Objects	True	Name	Type	Read Only	Description
			Address	String	True	The value of this property shall be an IPv4 address assigned to this interface. If DHCPv4 is enabled on the interface, this property becomes read-only
Ipv6Addresses	Array of Objects	True	Name	Type	Read Only	Description
			Address	String	True	This property lists an IPv6 address that is currently assigned on this interface
Ipv6DefaultGateway	String	True	This is the Ipv6 default gateway address that is currently in use on this interface.			
VLANs(N)	Object	True	<p>This is a reference to a collection of VLANs and is only used if the interface supports more than one VLANs. VlanInterfaceCollection.</p> <p>Note:</p>			

			Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added.				
LinkStatus	String	True	The value of this property shall be the link status of this interface (port).				
			Enum		Description		
			LinkUp		The link is available for communication on this interface.		
			NoLink		There is no link or connection detected on this interface.		
			LinkDown		There is no link on this interface, but the interface is connected.		
Links	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource				
			Name		Type	Read Only	Description
			Oem		Object	True	Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to "How to Add OEM extensions" document.
			Chassis(N)		Array	True	The value of this property shall be a reference to a resource of type Chassis that represent the physical container associated with this Ethernet Interface.
			Endpoints @odata.count		Number	True	An integer representing the number of items in a collection.

			Endpoints (N)	Array	True	The value of this property shall be a reference to the resources that this ethernet interface is associated with and shall reference a resource of type Endpoint. Note: These will be available only as a part of FPX Product.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			
DHCPv4	Object		DHCPv4 Configuration Properties.			
			Name	Type	Read Only	Description
			DHCPEnabled	Boolean	False	Determines whether DHCPv4 is enabled on this interface.
			UseDNSServers	Boolean	False	Determines whether DHCPv4 is enabled on this interface. Note: Northbound only support
			UseGateway	Boolean	False	Determines whether to use a DHCPv4- supplied gateway. Note: Northbound only support
			UseDomainName	boolean	False	Determines whether to use a DHCPv4- supplied domain name. Note: Northbound only support
			UseNTPServers	boolean	False	Determines whether to use DHCPv4-supplied NTP servers.



						Note: Northbound only support
			UseStatic Routes	boolean	False	Determines whether to use DHCPv4-supplied static routes. Note: Northbound only support
DHCPv6	Object	DHCPv6Configuration Configuration Properties				
			Name	Type	Read Only	Description
			UseDNSServer	Boolean	False	When enabled, DNS server addresses supplied through DHCPv6 stateless mode will be used. Note: Northbound only support
			OperatingMode	String	False	Determines the DHCPv6 operating mode for this interface
			UseDomainName	Boolean	False	When enabled, the domain name supplied through DHCPv6 stateless mode will be used. Note: Northbound only support
			UseNTPServers	Boolean	False	When enabled, NTP server addresses supplied through DHCPv6 stateless mode will be used. Note: Northbound only support
			UseRapidCommit	Boolean	False	Determines whether to use DHCPv6 rapid commit mode for stateful mode address assignments. Do not enable in networks where more than one



						DHCPv6 server is configured to provide address assignments. Note: Northbound only support
--	--	--	--	--	--	--

3.15.2 Managers

This resource shall be used to represent the NIC resources in the manager.

3.15.2.1 GET - EthernetInterface Instance

3.15.2.1.1 Request for EthernetInterface Instance

https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces/{{manager_ethifc_instance}}

Content-Type: application/json

3.15.2.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Note: Manager Ethernet Interface typically supports at max one VLAN per interface for a single BMC.

Table 32 Ethernet Interface Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 .

			Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
UefiDevicePath	String	True	The UEFI device path for this interface (port). Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Manager Ethernet Interface under Platform specific Properties in “How to Add OEM extensions” document .
Status	Object	True	Refer Section 3.3 for Status under Resource Complex Types.
InterfaceEnabled	Boolean	False	This indicates whether this interface is enabled.
PermanentMACAddress	String	True	The value of this property shall be the Permanent MAC Address of this interface (port). This value is typically programmed during the manufacturing time. This address is not assignable.
MACAddress	String	True	The value of this property shall be the effective current MAC Address of this interface. If an assignable MAC address is not supported, this is a read only alias of the PermanentMACAddress Note: Eventhough the ReadOnly attribute in Redfish schema for managers is specified as "False", In Redfish API, patching MACAddress is not allowed. Changing MACAddress will change the IP address and if user is using redfish in remote with no access to host/BMC, it will be an issue in obtaining new IP address and also change in MACAddress could result in mac address collision if there is a device on the local network with the same mac address.
SpeedMbps	Number	False	The current link speed of the interface in Mbps. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific

			libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Manager EthernetInterface under Platform specific Properties in “How to Add OEM extensions” document.												
StatelessAddressAutoConfig	Object	False	This object shall contain the IPv4 and IPv6 Stateless Address Automatic Configuration (SLAAC) properties for this interface.												
			<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read Only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>IPv4AutoConfigEnabled</td> <td>Boolean</td> <td>True</td> <td>This property shall indicate whether IPv4 Stateless Address Auto-Configuration (SLAAC) is enabled for this interface.</td> </tr> <tr> <td>IPv6AutoConfigEnabled</td> <td>Boolean</td> <td>True</td> <td>This property shall indicate whether IPv6 Stateless Address Auto-Configuration (SLAAC) is enabled for this interface.</td> </tr> </tbody> </table>	Name	Type	Read Only	Description	IPv4AutoConfigEnabled	Boolean	True	This property shall indicate whether IPv4 Stateless Address Auto-Configuration (SLAAC) is enabled for this interface.	IPv6AutoConfigEnabled	Boolean	True	This property shall indicate whether IPv6 Stateless Address Auto-Configuration (SLAAC) is enabled for this interface.
			Name	Type	Read Only	Description									
			IPv4AutoConfigEnabled	Boolean	True	This property shall indicate whether IPv4 Stateless Address Auto-Configuration (SLAAC) is enabled for this interface.									
IPv6AutoConfigEnabled	Boolean	True	This property shall indicate whether IPv6 Stateless Address Auto-Configuration (SLAAC) is enabled for this interface.												
IPv4AutoConfigEnabled	Boolean	True	This property shall indicate whether IPv4 Stateless Address Auto-Configuration (SLAAC) is enabled for this interface.												
IPv6AutoConfigEnabled	Boolean	True	This property shall indicate whether IPv6 Stateless Address Auto-Configuration (SLAAC) is enabled for this interface.												
AutoNeg	Boolean	False	The value of this property shall be true if auto negotiation of speed and duplex is enabled on this interface and false if it is disabled.												
FullDuplex	Boolean	False	<p>The value of this property shall represent the duplex status of the Ethernet connection on this interface.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Manager EthernetInterface under Platform specific Properties in “How to Add OEM extensions” document</p>												
MTUSize	Number	False	<p>The value of this property shall be the size in bytes of largest Protocol Data Unit (PDU) that can be passed in an Ethernet (MAC) frame on this interface.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific</p>												

			<p>libraries and gami module should be added. Please refer Manager EthernetInterface under Platform specific Properties in “How to Add OEM extensions” document.</p> <p>MTU (Maximum Transmission Unit)</p> <p>Note: Minimum size limit is 576</p> <p>Maximum size limit is 1500</p>												
HostName	String	False	DNS Hostname without any domain information.												
FQDN	String	False	This is the complete, fully qualified domain name obtained by DNS for this interface.												
MaxIPv6StaticAddresses	Number	True	This indicates the number of array items supported by Ipv6StaticAddresses.												
VLAN	Object	False	If this Network Interface supports more than one VLAN, this property will not be present and the client should look for VLANs collection in the link Section of this resource.												
			<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read Only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>VLANEnable</td> <td>Boolean</td> <td>False</td> <td>This indicates if this VLAN is enabled.</td> </tr> <tr> <td>VLANId</td> <td>Number</td> <td>False</td> <td>This indicates the VLAN identifier for this VLAN. Num value : 0 and Maximum value: 4095.</td> </tr> </tbody> </table>	Name	Type	Read Only	Description	VLANEnable	Boolean	False	This indicates if this VLAN is enabled.	VLANId	Number	False	This indicates the VLAN identifier for this VLAN. Num value : 0 and Maximum value: 4095.
			Name	Type	Read Only	Description									
			VLANEnable	Boolean	False	This indicates if this VLAN is enabled.									
VLANId	Number	False	This indicates the VLAN identifier for this VLAN. Num value : 0 and Maximum value: 4095.												
VLANEnable	Boolean	False	This indicates if this VLAN is enabled.												
VLANId	Number	False	This indicates the VLAN identifier for this VLAN. Num value : 0 and Maximum value: 4095.												
Ipv4Addresses	Array of Objects	False	This array of objects represents all of the Ipv4 static addresses to be assigned on this interface. Refer Table 33 Ipv4AddressesProperties.												
Ipv6Addresses	Array of Objects	False	This array of objects enumerates all of the currently assigned Ipv6 addresses on this interface. Refer Table 34 Ipv6AddressesProperties.												
Ipv6StaticAddresses	Array of Objects	False	<p>This array of objects represents all of the Ipv6 static addresses to be assigned on this interface.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Refer Manager</p>												

			EthernetInterface under Platform specific Properties in “How to Add OEM extensions” document	
			Name	Type
			Read Only	Description
			Oem	Object False Refer Section 3.3 for Resource Oem.
			Address	String False A static Ipv6 address that is currently assigned on a network interface.
			PrefixLength	Number True Provides the Ipv6 network prefix length in bits for this address.Min:1,Max:128 Note: Due to constraint of schema IPAddresses.v1_0_0.json, PrefixLength = 0 will be reported as ValidationError.
Ipv6DefaultGateway	String	True	This is the Ipv6 default gateway address that is currently in use on this interface.	
NameServers	Array [Items of type String]	True	This represents DNS name servers that are currently in use on this interface.	
VLANs(N)	Object	True	This is a reference to a collection of VLANs and is only used if the interface supports more than one VLANs VlanInterfaceCollection . Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added.	
LinkStatus	String	True	The value of this property shall be the link status of this interface (port).	
			Enum	Description
			LinkUp	The link is available for communication on this interface.

			NoLink	There is no link or connection detected on this interface.
			LinkDown	There is no link on this interface, but the interface is connected.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.	
DHCPv4	Object	False	This property shall contain the configuration of DHCP v4 as given in below Table 35 DHCPv4 properties.	
DHCPv6	Object	False	This property shall contain the configuration of DHCP v6 as given in below Table 36 DHCPv6 properties.	
IPv6StaticDefaultGateways	Array	False	The values in this array shall represent the IPv6 static default gateway addresses for this interface.	
IPv6StaticAddresses	Array of Objects	False	<p>The value of this property shall be an array of objects used to represent the IPv6 static connection characteristics for this interface. Refer Table 37 Ipv6StaticAddress Properties below.</p> <p>Note: Only one set of IPv6StaticAddresses can be patched and multiple IPv6StaticAddresses patch is not supported.</p>	
IPv4StaticAddresses	Array of Objects	False	<p>The value of this property shall be an array of objects used to represent all IPv4 static addresses assigned (but not necessarily in use) to this interface. Addresses in use by this interface shall also appear in the IPv4Addresses property. Refer Table 37 Ipv6StaticAddress Properties below.</p> <p>Note: Only one set of IPv4StaticAddresses can be patched and multiple IPv4StaticAddresses patch is not supported.</p>	

Table 33 Ipv4AddressesProperties

Name	Type	Read Only	Description
Address	String	False	This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only.
SubnetMask	Object	False	<p>This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only.</p> <p>String with pattern <code>^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$</code></p>

AddressOrigin	String	True	This is the Ipv4 gateway for this address.	
			Enum	Description
			Static	A static address as configured by the user.
			DHCP	Address is provided by a DHCPv4 service
			BOOTP	Address is provided by a BOOTP service.
			Ipv4LinkLocal	Address is valid only for this network segment (link).
Gateway	String	False	This is the Ipv4 default gateway address for this interface. If DHCPv4 is enabled on the interface and is configured to set the Ipv4 default gateway address, this property becomes read-only.	

Table 34 Ipv6AddressesProperties

Name	Type	Read Only	Description	
Address	String	False	A static Ipv6 address that is currently assigned on a network interface.	
PrefixLength	Number	True	Provides the Ipv6 network prefix length in bits for this address. Min.:, Max:128 Note: Due to constraint of schema IPAddresses.v1_0_0.json, PrefixLength = 0 will be reported as ValidationError.	
AddressOrigin	String	True	This is the Ipv6 address origin for this interface.	
			Enum	Description
			Static	A static address as configured by the user
			DHCPv6	Address is provided by a DHCPv6 service.
			LinkLocal	Address is valid only for this network segment (link).



			SLAAC	Address is provided by a Stateless Address AutoConfiguration (SLAAC) service.
--	--	--	-------	---

Table 35 DHCPv4 properties

Name	Type	Read Only	Description
DHCPEnabled	Boolean	False	Determines whether DHCPv4 is enabled on this interface
UseDNSServers	Boolean	False	Determines whether to use DHCPv4-supplied DNS servers. Note: Northbound only support
UseGateway	Boolean	False	Determines whether to use a DHCPv4-supplied gateway. Note: Northbound only support
UseDomainName	boolean	False	Determines whether to use a DHCPv4-supplied domain name. Note: Northbound only support
UseNTPServers	boolean	False	Determines whether to use DHCPv4-supplied NTP servers. Note: Northbound only support
UseStaticRoutes	boolean	False	Determines whether to use DHCPv4-supplied static routes. Note: Northbound only support

Table 36 DHCPv6 properties

Name	Type	Read Only	Description
OperatingMode	boolean	false	This property shall control the operating mode of DHCPv6 on this interface. DHCPv6 stateful mode is used to configure addresses, and when it is enabled, stateless mode is also implicitly enabled.
UseDNSServer	Boolean	False	When enabled, DNS server addresses supplied through DHCPv6 stateless mode will be used. Note: Northbound only support

UseDomainName	Boolean	False	When enabled, the domain name supplied through DHCPv6 stateless mode will be used. Note: Northbound only support
UseNTPServers	Boolean	False	When enabled, NTP server addresses supplied through DHCPv6 stateless mode will be used. Note: Northbound only support
UseRapidCommit	Boolean	False	Determines whether to use DHCPv6 rapid commit mode for stateful mode address assignments. Do not enable in networks where more than one DHCPv6 server is configured to provide address assignments. Note: Northbound only support

Table 37 Ipv6StaticAddress Properties

Name	Type	Read Only	Description
Address	String	False	A static Ipv6 address that is currently assigned on a network interface.
PrefixLength	Number	False	Provides the Ipv6 network prefix length in bits for this address. Min:1, Max:128 Note: Due to constraint of schema IPAddresses.v1_0_0.json, PrefixLength = 0 will be reported as ValidationError.
Oem	Object	True	StaticIPAddressIndex under Ami.

3.15.2.2 PATCH

3.15.2.2.1 Request

PATCH https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces/{{manager_ethifc_instance}}

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in json format.

Table 32 Ethernet Interface Properties for which ReadOnly is False that can be sent as Request body in json format

Note:

{{manager_ethifc_instance}} If this instance is usb0, PATCH is not supported.

PATCH on the instance for changing network settings will cause the current connection to be terminated.

Patch is not allowed for Ipv6/Ipv4 properties in DHCP mode. Patch of IPV6/IPV4 properties is allowed only in Static mode.

MACAddress/PermanentMACAddress is not allowed to patch and considered as read-only property

Patch for ethernet interface can be applied in particular set,

Patch set :

->IPv4Addresses, IPv6Addresses/IPv6StaticAddresses, VLAN

Note: Only one set of IPv6StaticAddresses can be patched and multiple IPv6StaticAddresses patch is not supported.

->FQDN, HostName

->AutoNeg,SpeedMbps,FullDuplex,MTUSize

->InterfaceEnabled

The reason is, as per the current design in BMC, if any changes applied in the network setting, the changes will be written in the network related files and network will restart. At that time other changes cannot be written.

For example if ipv4 and hostname/FQDN is applied at same time, for ipv4 details the changes will be written in the interface files and network will restart. At that time hostname/FQDN changes cannot be made.

So the restrictions were made to allow patch for particular set.

Patching InterfaceEnabled for eth0/eth1

Case 1: Bond is Enabled.

Eth0 and eth1 cannot be patched and an error will be thrown as follows:-

```
{  
  "error":
```

```

{
  "@Message.ExtendedInfo":
  [
    {
      "@odata.type": "#Message.v1_0_5.Message",
      "Message": "Since bond0 is enabled. InterfaceEnabled value of eth0/eth1
        cannot be PATCHed until bond0 is disabled.",
      "MessageArgs": [ "InterfaceEnabled"],
      "MessageId": "SyncAgent.1.0.BondEnabled",
      "RelatedProperties": ["/InterfaceEnabled"],
      "Resolution": "Disable Bond and try enabling/disabling eth0/eth1 the
        interface", "Severity": "Warning"
    }
  ],
  "code": "SyncAgent.1.0.BondEnabled",
  "message": "Since bond0 is enabled. InterfaceEnabled value of eth0/eth1 cannot
    be PATCHed until bond0 is disabled."
}
}

```

Case 2: Bond is Disabled.

Eth0 and eth1 can be patched i..e enabled or disabled.

Note: Behaviour of DHCPv6->OperatingMode

1. If only SLAAC IP (stateless) --> OperatingMode display Stateless
2. If only DHCPv6 IP (stateful) --> OperatingMode display Stateful
3. If only LinkLocal IP --> OperatingMode display Stateless
4. If having combination of all IP's --> OperatingMode display Stateless

Before applying any patch by user, OperatingMode will maintain the address-origin value. (ex: If we have dhcp ip's then address-origin will be DHCP and OperatingMode will be Stateful)

Once user apply patch, address-origin will have the actual outcome and OperatingMode will maintain the patched value(desired outcome) (ex: if patch is applied to change to stateless and we have no radvd server running, after successful patch we get only dhcp ip's, in that case we will show address-origin as DHCP and OperatingMode as Stateless)

Sample PATCH Request:

Sample patch request body for ethernet-interface properties for interface instance uri,

Ex: PATCH <https://{{ip}}/redfish/v1/Managers/Self/EthernetInterfaces/eth0>

To modify hostname and fqdn

```
{
  "FQDN": "NEWHOST.us.megatrends.com", "HostName": "NEWHOST"
}
```

To disable autoneg or to change FullDuplex/SpeedMbps we need to provide three properties

```
{
  "AutoNeg": false, "FullDuplex": true, "SpeedMbps": 10
}
```

To enable autoneg values

```
{
  "AutoNeg": true
}
```

To patch MTUSize

```
{
  "MTUSize": 1450
}
```

To disable dhcp for IPv4Address

```
{
  "DHCPv4":
  {
    "DHCPEnabled": false
  },
}
```

```
"IPv4Addresses":  
[  
  {  
    "Address": "10.0.124.86",  
    "Gateway": "10.0.120.1",  
    "SubnetMask": "255.255.248.0"  
  }  
]  
}
```

To modify IPv4StaticAddress details

```
{  
  "IPv4StaticAddresses":  
  [  
    {  
      "Address": "10.0.124.86",  
      "Gateway": "10.0.120.1",  
      "SubnetMask": "255.255.248.0"  
    }  
  ]  
}
```

To Enable DHCP in IPv4

```
{  
  "DHCPv4":  
  {  
    "DHCPEnabled":true  
  }  
}
```

False value to disable DHCP.

To enable/disable interface

```
{
  "InterfaceEnabled": true
}

{
  "FQDN": "NEWHOST.us.megatrends.com",
  "FullDuplex": true,
  "AutoNeg": false,
  "MTUSize": 1450,
  "SpeedMbps": 10,
  "HostName": "NEWHOST",
  "MACAddress": "00:1a:2b:11:11:11",
  "IPv4Addresses":
  [
    {
      "Address": "172.16.97.178",
      "Gateway": "172.16.96.1",
      "SubnetMask": "255.255.248.0"
    }
  ],
  "IPv6Addresses":
  [
    {
      "Address": "2001:db8:1:0:21a:2bff:fe11:1111"
    }
  ],
  "InterfaceEnabled": true
}
```

```
}
```

To Disable DHCP in IPv6Address

```
{  
  "DHCPv6":  
  {  
    maa "OperatingMode": "Disabled"  
  },  
  
  "IPv6Addresses":  
  [  
    {  
      "Address": "2001:b021:2d:0:475e:a232:7e1d:7438",  
      "Oem":  
      {  
        "Ami":  
        {  
          "StaticIPAddressIndex": 10  
        }  
      }  
    }  
  ]  
}
```

DHCPv6 OperatinMode Allowable values -- allowable values disabled, stateless, stateful

To modify IPv6StaticAddress details

```
{  
  "IPv6StaticAddresses":  
  [  

```



```

    {
      "Address": ":b021:2d:0:475e:a232:7e1d:7438",
      "PrefixLength": 64,
      "Oem":
      {
        "Ami":
        {
          "StaticIPAddressIndex": 10
        }
      }
    }
  ]
}

```

To Enable DHCP in IPv6

```

{
  "DHCPv6":
  {
    "OperatingMode": "Stateless"
  }
}

```

False value to disable DHCP.

3.15.2.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.16 BIOS

Bios contains properties surrounding a BIOS Attribute Registry (where the system-specific BIOS attributes are described) and the Actions needed to perform changes to BIOS settings, which typically require a system reset to apply.

The “@Redfish.Settings” property in the response of “/redfish/v1/Systems/Self/Bios”, denotes that the client makes requests to change BIOS settings by modifying the Resource identified by the `@Redfish.Settings` property. For more details about “@Redfish.Settings” property, refer [Section 3.91](#)

Note: This works only with ASUS BIOS REST/Redfish module and Host Interface Support in BMC.

3.16.1 GET – BIOS & BIOS/SD

3.16.1.1 Request for BIOS

https://{{ip}}/redfish/v1/Systems/Self/Bios

Content-Type: application/json

Note: This is the current setting available in BIOS

3.16.1.2 Request for BIOS/SD

https://{{ip}}/redfish/v1/Systems/Self/Bios/SD

Content-Type: application/json

Note: This is the future setting requested by user. For the changes to apply in BIOS, system reset is required

This URI will only be available if the “/conf/redfish/bios/bios_future_setting.json” file exists, else the implementation will throw 404 NotFound.

3.16.1.3 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 38 Bios Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1

@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
AttributeRegistry	String	True	The Resource ID of the Attribute Registry for the BIOS Attributes resource.
Actions	Object	True	The Actions property shall contain the available actions for this resource namely ChangePassword or ResetBios. It can also contain Oem Actions.
Attributes	Object	False	BIOS Attribute settings appear as additional properties in this object, and can be looked up in the Attribute Registry by their AttributeName. This is the manufacturer/provider specific list of BIOS attributes.

3.16.2 POST

3.16.2.1 BIOS RESET ACTION

3.16.2.1.1 Request

POST `https://{ip}/redfish/v1/Systems/Self/Bios/Actions/Bios.ResetBios`

Content-Type: application/json

Example POST Request Body:

```
{
  "ResetType": "Reset"
}
```

3.16.2.1.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note : Out-Of-Band request for this action will be blocked during the Host System Booting until the Inventory is processed by the redfish service and the request will respond with status code 503 and Service Not Available message.

3.16.2.2 BIOS CHANGE PASSWORD ACTION

3.16.2.2.1 Request

POST `https://{ip}/redfish/v1/Systems/Self/Bios/Actions/Bios.ChangePassword`

Content-Type: application/json

Example POST Request Body:

```
{
  "PasswordName": "SETUP001",
  "OldPassword": "old",
  "NewPassword": "new"
}
```

3.16.2.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note : Out-Of-Band request for this action will be blocked during the Host System Booting until the Inventory is processed by the redfish service and the request will respond with status code 503 and Service Not Available message.

3.16.3 POST, PUT, PATCH - BIOS SD

3.16.3.1 Request – POST

POST `https://{ip}/redfish/v1/Systems/Self/Bios/SD`

Content-Type: application/json

3.16.3.2 Request – PATCH

PATCH https://{ip}/redfish/v1/Systems/Self/Bios/SD

Content-Type: application/json

3.16.3.3 Request – PUT

PUT https://{ip}/redfish/v1/Systems/Self/Bios/SD

Content-Type: application/json

Example POST /PATCH/PUT Request Body:

```
{
  "Attributes":
  {
    "ACPI002": false,
    "ACPI003": true
  }
}
```

Note: If the values of the attributes in POST/PATCH/PUT request body match with the existing current values in BIOS (i.e current_bios_settings file OR Systems/Self/Bios) then it will not be included in future_settings BIOS file and hence will not be displayed in GET call of Bios/SD.

This URI does not have any Request Body size limit for POST/PATCH/PUT methods.

3.16.3.4 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note: Out-Of-Band PATCH/POST/PUT request will be blocked during the Host System Booting until the Inventory is processed by the redfish service and the request will respond with status code 503 and Service Not Available message.

3.17 SimpleStorageCollection

This represents the collection of Simple Storage resources.

Note: Northbound API is supported but still requires host agent support from host agent and in-band communication channel and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.

3.17.1 GET

3.17.1.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/SimpleStorage

Content-Type: application/json

3.17.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.18 SimpleStorage

This is the schema definition for the Simple Storage resource. It represents the properties of a storage controller and its directly-attached devices

Note: Northbound API is supported but still requires host agent support from host agent and in-band communication channel and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.

3.18.1 GET

3.18.1.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/SimpleStorage/
{{system_simplestorage_instance}}

Content-Type: application/json

3.18.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 39 Simple StorageProperty

Name	Type	Read Only	Description			
@odata.context	String	True	Refer Section 3.1			
@odata.id	String	True	Refer Section 3.1			
@odata.type	String	True	Refer Section 3.1			
@odata.etag	String	True	Refer Section 3.1			
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extensions" document.			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
UefiDevicePath	String	True	The UEFI device path used to access this storage controller. This path is used to identify and locate the specific storage controller.			
Status	Object	True	Refer Section 3.3 for Resource.Status.			
Links	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource			
			Name	Type	Read Only	Description
			Oem	Object	False	Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to "How to Add OEM extensions" document.

			Chassis(N)	Array	True	The value of this property shall be a reference to a resource of type Chassis that represent the physical container associated with this Simple Storage.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			
			Name	Type	Read Only	Description
			Oem	Object	False	Refer Section 3.3 for Resource.Oem.
			Name (M)	String	True	Name of the resource or array element
			Status	Object	True	Refer Section 3.3 for Resource.Status.
			Manufacturer	String	True	Name of the manufacturer of this storage device.
			Model	String	True	Model number of this device.
			CapacityBytes	Number	True	The value of this property shall represent the size (in bytes) of the Storage Device.

3.19 LogServiceCollection

This represents the collection of Log Service resources.

Refer [Section 13.3](#) for a detailed description.

3.19.1 GET

3.19.1.1 Request

`https://{{ip}}/redfish/v1/Systems/{{system_instance}}/LogServices`



Content-Type: application/json

OR

https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/LogServices

Content-Type: application/json

OR

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/LogServices

Content-Type: application/json

OR

https://{{ip}}/redfish/v1/TelemetryService/LogServices

Content-Type: application/json

system_instance BIOS

manager_instance AuditLog, SEL and EventLog

telemetryservice metricreportlog

chassis-instance - Logs

3.19.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.20 Log Service

This resource represents the log service for the resource or service to which it is associated. This resource shall be used to represent a log service for a Redfish implementation.

Refer [Section 13.3](#) for a detailed description.

The following are the 3 types:-

- BIOS logs are supported under Systems LogServices.
/redfish/v1/Systems/Self/LogServices/BIOS
- AuditLog, EventLog & SEL are supported under Manager LogServices.
/redfish/v1/Managers/Self/LogServices/AuditLog
/redfish/v1/Managers/Self/LogServices/SEL

/redfish/v1/Managers/Self/LogServices/EventLog

- Logs are supported under Chassis LogServices.

/redfish/v1/Chassis/Self/LogServices/Logs

- MetricReportLog is supported under TelemetryService LogServices.

/redfish/v1/TelemetryService/LogServices/MetricReportLo

Note:

- LogLimit

Number of Logs is limited to 150 for each one of the logs mentioned above.

- IPMI SEL Logs

IPMI SEL Logs include System BIOS Logs and Managers SEL Logs. These Logs will be reflected in Redfish only when “ServiceEnabled” property is true.

- IPMI Oem SEL logs would be displayed only when platform/oem specific porting support is added.

3.20.1 System BIOS Logs

Clearing BIOS related SEL entries through IPMITool will reflect in Redfish in /Systems/Self/LogServices/BIOS/Entries.

on delete cascade:

- Please refer Section 1.4.9 in System Log Service under Configurable properties in “How to Add OEM extensions” document for redis Keys.
- False- Clearing BIOS related SEL entries from Redfish will clear only in Redfish and will not clear the actual logs from IPMI and hence will not be in sync.
- True- Clearing BIOS related SEL entries from Redfish will clear in both Redfish and IPMI and the logs in IPMI and Redfish will be in sync.
- Eg:SET Redfish:Systems:Self:LogServices:BIOS:onDeleteCascade true/false in systems.rcmd under db_init in redfish_core package should be modified at buildtime

3.20.2 Chassis Logs

The following SEL Logs will be displayed under Chassis:-

- Temperature, Fan, Voltage, Current, Physical Intrusion, Power Supply and Power Unit

3.20.2.1 Clearing Chassis Logs

Clearing SEL entries through IPMITool will reflect in Redfish in /Chassis/Self/LogServices/Logs/Entries.

OnDeleteCascade

- Please refer Section 1.4.9 in System Log Service under Configurable properties in “How to Add OEM extensions” document for redis Keys.
- False - Clearing SEL entries from Redfish will clear only in Redfish and will not clear the actual logs from IPMI and hence will not be in sync.
- True - Clearing SEL entries from Redfish will clear in both Redfish and IPMI and the logs in IPMI and Redfish will be in sync.
- Eg: SET Redfish:Chassis:Self:LogServices:Logs:onDeleteCascade true/false in managers.rcmd under db_init in redfish_core package should be modified at buildtime.

3.20.3 Manager Audit Logs

The following entries will be added in Managers Audit Logs :-

- Any unauthorized usage of the resource based on “AuthFailureLoggingThreshold” property value.
- All Successful HI-NoAuth communication to BMC.
- System Bios, BiosAttributeRegistry, BiosStaticFiles, InventoryData are Posted to BMC.
- All Successful Post Actions except SubmiTestEvent, SubmitTestMetricReport and RedfishDBReset Actions.
- All Successful Patch operations (ResourceModified)

3.20.4 Manager Event Logs

The following entries will be added in Managers Event Logs :-

- All Successful Resource creation (Post Operations)
- All Successful Resource updation (Patch Operations)
- All Successful Resource deletion (Delete Operations)

3.20.5 Manager SEL Logs

Clearing SEL entries through IPMITool will reflect in Redfish in /Managers/Self/LogServices/SEL/Entries only. on delete cascade

Please refer Section 1.4.10 in System Log Service under Configurable properties in “MegaRAC Redfish-How to Add OEM extensions” document for redis Keys.

- False:
Clearing SEL entries from Redfish will clear only in Redfish and will not clear the actual logs from IPMI and hence will not be in sync.
- True :
Clearing SEL entries from Redfish will clear in both Redfish and IPMI and the logs in IPMI and Redfish will be in sync.
- Eg:
SET Redfish:Managers:Self:LogServices:SEL:onDeleteCascade true/false in managers.rcmd under db_init in redfish_core package should be modified at buildtime.

3.20.6 Max Log Entries –SPI Image

1.5MB conf writable area should be available for the following logs with 150 max logs each :- AuditLog, SEL, BIOS & Logs.

MetricReportLog - 100 max logs.

If the count of max logs is to be increased, conf writable area should be proportionately increased.

3.20.7 GET

3.20.7.1 Request

https://{ip}/redfish/v1/Systems/{system_instance}/LogServices/
{system_log_instance}

Content-Type: application/json

OR

https://{ip}/redfish/v1/Managers/{manager_instance}/LogServices/
{manager_log_instance}

Content-Type: application/json

OR

https://{ip}/redfish/v1/Chassis/{chassis_instance}/LogServices/
{chassis_log_instance} Content-Type: application/json

OR

https://{ip}/redfish/v1/TelemetryService/LogServices/
{TelemetryService_log_instance} Content-Type: application/json

3.20.7.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 40 Log Service Properties

Name	Type	Read Only	Description	
@odata.context	String	True	Refer Section 3.1	
@odata.id	String	True	Refer Section 3.1	
@odata.type	String	True	Refer Section 3.1	
@odata.etag	String	True	Refer Section 3.1	
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.	
Id(M)	String	True	Resource Identifier	
Name(M)	String	True	Name of the Resource	
Description	String	True	Provides description of the resource. Refer Section 3.3	
ServiceEnabled	Boolean	False	Indicates whether this service is enabled. Default it will be null value	
MaxNumberOfRecords(C)	Number	True	The maximum numbers of LogEntries this service can have. This value is by default configured as 150 for AuditLog, SEL, BIOS Logs and 100 for MetricReport Logs.	
OverWritePolicy(C)	String	True	Indicates the policy of the log service when the MaxNumberOfRecords has been reached or when the log is full.	
			Enum	Description
			WrapsWhenFull	When full, new entries to the Log will overwrite previous entries.
DateTime	String	False	The current DateTime (with offset from UTC) for the log service in Redfish Timestamp format.	

			<p>Note: The valid range is -12:00 to +14:00. Please refer the following link for the allowable values within the above specified range.</p> <p>https://en.wikipedia.org/wiki/List_of_UTC_time_offsets</p>	
DateTimeLocalOffset	String	False	<p>The time offset from UTC that the DateTime property is set to in format: +06:00.</p> <p>Note: The valid range is -12:00 to +14:00. Please refer the following link for the allowable values within the above specified range.</p> <p>https://en.wikipedia.org/wiki/List_of_UTC_time_offsets</p>	
Actions	Object	True	The Actions property shall contain the available actions for this resource like LogService.ClearLog or any other OEMActions.	
Status	Object	True	Refer Section 3.3 for Resource Status.	
Entries(N)	Object	True	The value of this property shall reference a collection of resources of type LogEntry .	
LogEntryType	String	True	The format of the log entries.	
			Enum	Description
			Event	The log contains Redfish-defined messages (events).
			SEL	The log contains legacy IPMI System Event Log (SEL) entries.
			Multiple	The log contains multiple Log Entry types or a single entry type cannot be guaranteed by the Log Service.
			OEM	The log contains entries in an OEM-defined format.

3.20.8 PATCH

3.20.8.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/LogServices/
{{system_log_instance}}

Content-Type: application/json

OR



https://{ip}/redfish/v1/Managers/{manager_instance}/LogServices/
{manager_log_instance}

Content-Type: application/json

OR

https://{ip}/redfish/v1/Chassis/{chassis_instance}/LogServices/
{chassis_log_instance}

Content-Type: application/json

OR

https://{ip}/redfish/v1/TelemetryService/LogServices/
{TelemetryService_log_instance} Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 40 Log Service Properties for which ReadOnly is False that can be sent as Request body in json format.

3.20.8.2 Response

The response status is success by either one of the following two scenarios.

- The response status 204, means success and the response body should not be return.
- The response status 200 means success and the response body is a GET Response with the changed values specified in the Patchable properties in Request body

3.20.9 POST

3.20.9.1 Request

POST https://{ip}/redfish/v1/Managers/{manager_instance}/LogServices/
{manager_log_instance}/Actions/LogService.ClearLog

Content-Type: application/json

Example POST Request URL

https://{ip}/redfish/v1/Managers/Self/LogServices/BIOS/Actions/LogService.ClearLog

https://{ip}/redfish/v1/Chassis/Self/LogServices/Logs/Actions/LogService.ClearLog

https://{ip}/redfish/v1/Managers/Self/LogServices/AuditLog/Actions/
LogService.ClearLog

Example POST Request Body:

```
{
  "ClearType": "ClearAll"
}
```

3.20.9.2 Response

The response of the request will be in JSON format with the success status code as 202. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

```
{
  "@odata.context":
    "/redfish/v1/$metadata#Task.Task(TaskState,Description,Name,Id)",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_2.Task",
  "Description": "Task for Chassis LogService",
  "Id": "1",
  "Name": " Chassis LogService ",
  "TaskState": "New"
}
```

3.21 LogEntryCollection

This represents the collection of Log Entry resources

3.21.1 GET

Note : The count of Members in response is limited to 50 as showing all Entries will increase response time.

3.21.1.1 Request

```
https://{ip}/redfish/v1/Systems/{system_instance}/LogServices/
{system_log_instance}/Entries
```

Content-Type: application/json

OR

```
https://{ip}/redfish/v1/Managers/{manager_instance}/LogServices/
```


{{manager_log_instance}}/Entries

Content-Type: application/json

OR

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/LogServices/

{{chassis_log_instance}}/Entries

Content-Type: application/json

OR

https://{{ip}}/redfish/v1/TelemetryLogService/LogServices/MetricReportLog/

Entries/{{MetricReportLog_logentry_inst

Content-Type: application/json

3.21.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.22 Log Entry

This resource represents the log record format for logs. It is designed to be used for SEL logs from IPMI as well as Event Logs and OEM specific logs. The EntryType NAME indicates the type of log and there are other properties dependent on its value.

3.22.1 GET

3.22.1.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/LogServices/

{{system_log_instance}}/Entries/{{system_logentry_instance}}

Content-Type: application/json

OR

https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/LogServices/

{{manager_log_instance}}/Entries/{{manager_logentry_instance}}

Content-Type: application/json OR

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/LogServices/

{{chassis_log_instance}}/Entries/{{chassis_logentry_instance}}

Content-Type: application/json OR

https://{{ip}}/redfish/v1/TelemetryLogService/LogServices/

MetricRerportLog/Entries/{{MetricReportLog_logentry_instance}}

Content-Type: application/json

3.22.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 41 Log Entry Property

Name	Type	Read Only	Description
@odatacontext	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to How to Add OEM extensions” document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Severity	String	True	This is the severity of the log entry. It can take any one of the Enum values OK, Warning or Critical.
Created	String	True	The time the log entry was created.
EventId	String	True	If present, this LogEntry records an Event and the value shall indicate a unique identifier for the event, the format of which is implementation dependent. Note: This property will be populated only for EventLogs.

EventTimestamp	String	True	If present, this LogEntry records an Event and the value shall be the time the event occurred.	
EntryType(M)	String	True	This property shall represent the type of LogEntry. If the resource represents an IPMI SEL log entry, the value shall be SEL. If the resource represents an Event log, the value shall be Event. If the resource represents an OEM log format, the value shall be Oem. Enum can be Event, SEL or Oem.	
EntryCode	String	True	This property shall be present if the EntryType value is SEL. These enumerations are the values from table 42-1 and 42-2 of the IPMI specification.	
			<table border="1"> <thead> <tr> <th>Type</th> <th>String</th> </tr> </thead> <tbody> <tr> <td>String</td> <td>Assert Deassert Lower Non-critical - going low Lower Non-critical - going high Lower Critical - going low Lower Critical - going high Lower Non-recoverable - going low Lower Non-recoverable - going high Upper Non-critical - going low Upper Non-critical - going high Upper Critical - going low Upper Critical - going high Upper Non-recoverable - going low Upper Non-recoverable - going high Transition to Idle Transition to Active Transition to Busy State Deasserted State Asserted Predictive Failure deasserted</td> </tr> </tbody> </table>	Type
Type	String			
String	Assert Deassert Lower Non-critical - going low Lower Non-critical - going high Lower Critical - going low Lower Critical - going high Lower Non-recoverable - going low Lower Non-recoverable - going high Upper Non-critical - going low Upper Non-critical - going high Upper Critical - going low Upper Critical - going high Upper Non-recoverable - going low Upper Non-recoverable - going high Transition to Idle Transition to Active Transition to Busy State Deasserted State Asserted Predictive Failure deasserted			

				Predictive Failure asserted Limit Not Exceeded Limit Exceeded Performance Met Performance Lags Transition to OK Transition to Non-Critical from OK Transition to Critical from less severe Transition to Non-recoverable from less severe Transition to Critical from Non-recoverable Transition to Non-recoverable Monitor Informational Device Removed /Device Absent Device Inserted /Device Present Device Disabled Device Enabled Transition to Running Transition to In Test Transition to Power Off Transition to On Line Transition to Off Line Transition to Off Duty Transition to Degraded Transition to Power Save Install Error Fully Redundant Redundancy Lost Redundancy Degraded
--	--	--	--	--

			Non-redundant:Sufficient Resources from Redundant Non-redundant:Sufficient Resources from Insufficient Resources Non-redundant:Insufficient Resources Redundancy Degraded from Fully Redundant Redundancy Degraded from Non- redundant D0 Power State D1 Power State D2 Power State D3 Power State	
SensorType	String	True	This property shall be present if the EntryType value is SEL.	
			Type	String
			String	Platform Security Violation Attempt Temperature Voltage Current Fan Physical Chassis Security Processor Power Supply /Converter PowerUnit CoolingDevice Other Units-based Sensor Memory Drive Slot/Bay POST Memory Resize System Firmware Progress Event Logging Disabled System Event

			<p>Critical Interrupt</p> <p>Button/Switch</p> <p>Module/Board</p> <p>Microcontroller/Coprocessor</p> <p>Add-in Card</p> <p>Chassis</p> <p>ChipSet</p> <p>Other FRU</p> <p>Management Subsystem Health</p> <p>Battery</p> <p>Session Audit</p> <p>Version Change</p> <p>FRUState</p> <p>OEM</p>
SensorNumber	Number	True	This property decodes from EntryType: If it is SEL, it is the sensor number; if Event it is not applicable. Otherwise, it is Oem specific.
Message	String	True	<p>This property shall be the Message property of the event and decodes from EntryType. If EntryType is "Event" then it is a message description. If EntryType is "SEL" then it contain SEL Specific message otherwise "Oem" specific Log entry. In most cases, this property contains actual Log Entry.</p> <p>Note:</p> <p>Populated for all logs.</p> <p>Entry Type is "SEL" then Message contain SEL message format message format specified in Table 31-1 SEL Event Records in IPMI Specification v2.0 revision 1.1</p>
MessageId	String	True	<p>This property shall the MessageId property of the event and decodes from EntryType. If EntryType is "SEL" Event then it is a Redfish Specification-defined MessageId. If EntryType is "SEL" then it contain Event Data otherwise "Oem" specific information.</p> <p>Note:</p>

			<p>Populated for all logs.</p> <p>Entry Type is "Event" then MessageId format will be RegistryName.MajorVersion.MinorVersion.MessageKey.</p> <p>EntryType is "SEL" then MessageId format will be ^0[xX]([a-fA-F][0-9]){2}{3}\$ i.e. first byte is EventData1 second byte is EventData2 and third byte is EventData 3.</p>												
MessageArguments	Array	True	<p>This contains message arguments to be substituted into the message included or in the message looked up via a registry.</p> <p>Note:</p> <p>Populated only for AuditLog, EventLog and MetricReportLog.</p>												
Links	Object		<p>Contains references to other resources that are related to this resource.</p>												
			<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read Only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Oem</td> <td>Object</td> <td></td> <td>Refer Section 3.3 for Links under Resource Complex Types.</td> </tr> <tr> <td>OriginOfCondition</td> <td>Object</td> <td>True</td> <td>This is the URI of the resource that caused the log entry. Refer idRef in odata4.0.0.json.</td> </tr> </tbody> </table>	Name	Type	Read Only	Description	Oem	Object		Refer Section 3.3 for Links under Resource Complex Types.	OriginOfCondition	Object	True	This is the URI of the resource that caused the log entry. Refer idRef in odata4.0.0.json.
			Name	Type	Read Only	Description									
			Oem	Object		Refer Section 3.3 for Links under Resource Complex Types.									
OriginOfCondition	Object	True	This is the URI of the resource that caused the log entry. Refer idRef in odata4.0.0.json.												
Oem	Object		Refer Section 3.3 for Links under Resource Complex Types.												
OriginOfCondition	Object	True	This is the URI of the resource that caused the log entry. Refer idRef in odata4.0.0.json.												
OemLogEntryCode	String	True	<p>If the LogEntryCode type is OEM, this will contain the OEM-specific entry code.</p> <p>Note: Nothbound only support.</p>												
OemSensorType	String	True	<p>If the Sensor Type is OEM, this will contain the OEM-specific sensor type.</p> <p>Note: Nothbound only support.</p>												

3.23 VLAN Network Interface Collection

This represents the collection of VLAN Interface Collection resources.

Note:



Northbound API is supported but still requires host agent support from host agent and in-band communication channel and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.

3.23.1 GET

3.23.1.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/
{{system_ethifc_instance}}/VLANs

Content-Type: application/json

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/
{{network_apadter_instance}}/NetworkDevice Functions/
{{network_device-function_instance}}/Ethernet/VLANs

Content-Type: application/json

3.23.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.23.2 POST

Note :

This action is not supported in SPX-13.0 RTP 1.8 release as LAN over USB is not enabled.
POST is only allowed on VLANs under Systems-EthernetInterfaces

3.23.2.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/
{{system_ethifc_instance}}/VLANs

Content-Type: application/json

Example POST Request Body:

```
{  
  "VLANId": 100  
  "VLANEnable":true  
}
```

3.23.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.24 VLANNetworkInterface

This resource represents the VLAN Network Interface for the resource or service to which it is associated. This resource shall be used to represent a Network Interface for a Redfish implementation.

Note: Northbound API is supported but still requires host agent support from host agent and in-band communication channel and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.

3.24.1 GET

3.24.1.1 Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/
 {{system_ethifc_instance}}/VLANs/{{system_vlan_instance}}

Content-Type: application/json

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/
 {{network_apadter_instance}}/NetworkDevice Functions/
 {{network_device-function_instance}}/Ethernet/VLANs/{{Vlan_instance}}

Content-Type: application/json

Eg:

https://{{ip}}/redfish/v1/Systems/Self/EthernetInterfaces/bond0/
 VLANs/{{system_vlan_instance}}

3.24.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 42 VLAN Network Interface

Name	Type	Read Only	Description
@odata.cont ext	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1

@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
VLANEnable	Boolean	True	This property shall be used to indicate if this VLAN is enabled for this interface.
VLANId	Number	True	This property shall be used to indicate the VLAN identifier for this VLAN. Minimum:1 & Maximum:4094.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.

3.24.2 PATCH

Note:

This action is not supported in SPX-13.0 RTP 1.8 release as LAN over USB is not enabled. PATCH is only allowed on VLANs under Systems-EthernetInterfaces

3.24.2.1 Request

```
https://{ip}/redfish/v1/Systems/{system_instance}/EthernetInterfaces/
{system_ethifc_instance}/VLANs/{system_vlan_instance}
```

Content-Type: application/json

Example PATCH Request Body:

```
{
  "VLANId": 100
  "VLANEnable": true
}
```

}

3.24.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note : Out-Of-Band PATCH for VLANS instances will be blocked during the Host System Booting until the inventory is processed by the redfish service and the request will respond with status code 503 and Service Not Available message.

3.24.3 DELETE

Note :

This action is not supported in SPX-13.0 RTP 1.8 release as LAN over USB is not enabled.

DELETE is only allowed on VLANs under Systems-EthernetInterfaces

3.24.3.1 Request

`https://{{ip}}/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/
{{system_ethifc_instance}}/VLANs/{{system_vlan_instance}}`

3.24.3.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.25 Chassis Collection

This resource shall be used to represent a collection of chassis.

3.25.1 GET

3.25.1.1 Request

`https://{{ip}}/redfish/v1/Chassis`

Content-Type: application/json

3.25.1.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.26 Chassis

Chassis resource represents the physical components properties for any system. The non-CPU/device centric parts of the schema are all accessed either directly or indirectly through this resource. This one object is intended to represent racks, rack mount servers, blades, standalone, modular systems, enclosures, and all other containers.

3.26.1 GET

3.26.1.1 Request

`https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}`

Content-Type: application/json

3.26.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 43 Chassis Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
Id(M)	String	True	Resource Identifier

Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
ChassisType (M)	String	True	ChassisType shall indicate the physical form factor for the type of chassis. Refer Table 44 Chassis Type Enum Properties below for allowable Enum attributes.
Manufacturer (C)	String	True	The manufacturer of this chassis. Note: Platform specific porting needed. Require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extensions" document.
Model(C)	String	True	The model number for this chassis. Note : Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extensions" document.
SKU(C)	String	True	This is the SKU for this chassis. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extensions" document.
Sensors	Object	True	The navigation pointer to the Sensor Collection located in the equipment and sub-components.
SerialNumber(C)	String	True	The serial number for this chassis. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.
PartNumber(C)	String	True	The part number for this chassis. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific

			libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.	
PCleDevices	Object	True	An references to the PCIe Devices Collection located in this Chassis.	
AssetTag	String	False	The user assigned asset tag for this chassis. Default it will be null value	
UUID	String	True	The Universal Unique Identifier (UUID) for this Chassis. Default it will be null value Note: Platform specific porting needed. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.	
IndicatorLED	String	False	The state of the indicator LED, used to identify the chassis.	
			Enum	Description
			Unknown	The state of the Indicator LED cannot be determined.
			Lit	The Indicator LED is lit.
			Blinking	The Indicator LED is blinking.
			Off	The Indicator LED is off.
Links	Object	True	The links object contains the links to other resources that are related to this resource. Refer Table 45 Chassis Links Properties.	
Actions	Object	True	The Actions object contains the available custom actions on this resource like ChassisReset and OemActions if any.	
Status	Object	True	Refer Section 3.3 for Resource Status.	
Thermal(N)	Object	True	A reference to the thermal properties (fans, cooling, sensors) for this chassis.	
Power(N)	Object	True	A reference to the power properties (power supplies, power policies, sensors) for this chassis.	
PowerState	String	True	This is the current power state of the chassis.	
			Enum	Description
			On	The components within the chassis has power on.

			Off	The components within the chassis has no power, except some components may continue to have AUX power such as management controller.			
			PoweringOn	A temporary state between Off and On. The components within the chassis can take time to process the power on action.			
			PoweringOff	A temporary state between On and Off. The components within the chassis can take time to process the power off action.			
PhysicalSecurity	Object	False	Please refer the PhysicalSecurity property table below.				
			Name	Type	Read Only	Description	
			IntrusionSensorNumber	Number	True		
			IntrusionSensor	String	False	This indicates the known state of the physical security sensor. Default it will be null value	
						Enum	Description
						Normal	No abnormal physical security conditions are detected at this time
						HardwareIntrusion	A door, lock, or other mechanism protecting the internal system hardware from being accessed is detected as being in an insecure state.

						Tampering Detected	Physical tampering of the monitored entity is detected
			IntrusionSensorReArm	String	True	This indicates how the Normal state to be restored	
						Enum	Description
						Manual	This sensor would be restored to the Normal state by a manual re-arm.
						Automatic	This sensor would be restored to the Normal state automatically as no abnormal physical security conditions are detected.
			Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.				
Location	Object	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource.Location. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added				
HeightMm	Number	True	The height of the chassis. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.				
WidthMm	Number	True	The width of the chassis.				



			Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.	
DepthMm	Number	True	The depth of the chassis. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.	
WeightKg	Number	True	The weight of the chassis. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.	
NetworkAdapters	Object	True	A reference to the collection of Network Adapters associated with this chassis Please Refer Collection Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.	
EnvironmentalClass	String	True	The ASHRAE Environmental Class for this Chassis. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.	
			Enum	Description
			A1	ASHRAE Environmental Specification Class 'A1'
			A2	ASHRAE Environmental Specification Class 'A2'
			A3	ASHRAE Environmental Specification Class 'A3'
			A4	ASHRAE Environmental Specification Class 'A4'



Table 44 Chassis Type Enum Properties

ChassisType	
Enum	Description
Rack	An equipment rack, typically a 19-inch wide freestanding unit
Blade	An enclosed or semi-enclosed, typically vertically-oriented, system chassis which must be plugged into a multi-system chassis to function normally
Enclosure	A generic term for a chassis that does not fit any other description
StandAlone	A single, free-standing system, commonly called a tower or desktop chassis
RackMount	A single system chassis designed specifically for mounting in an equipment rack
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
Row	A collection of racks
Pod	A collection of equipment racks in a large, likely transportable, container
Expansion	A chassis which expands the capabilities or capacity of another chassis
Sidecar	A chassis that mates mechanically with another chassis to expand its capabilities or capacity"
Zone	A logical division or portion of a physical chassis that contains multiple devices or systems that cannot be physically separated
Sled	An enclosed or semi-enclosed, system chassis which must be plugged into a multi-system chassis to function normally similar to a blade type chassis.
Shelf	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis which must be plugged into a multi-system chassis to function normally
Drawer	An enclosed or semi-enclosed, typically horizontally-oriented, system chassis which may be slid into a multi-system chassis.

Module	A small, typically removable, chassis or card which contains devices for a particular subsystem or function
Component	A small chassis, card, or device which contains devices for a particular subsystem or function
Other	A chassis that does not fit any of these definitions
StorageEnclosure	A chassis which encloses storage.

Table 45 Chassis Links Properties

Name	Type	Read Only	Description
ComputerSystems(N)	Array	True	An array of references to the computer systems contained in this chassis. This will only reference ComputerSystems that are directly and wholly contained in this chassis.
ComputerSystems@odata.count	Number	True	An integer representing the number of items in a collection.
ManagedBy(N)	Array	True	An array of references to the Managers responsible for managing this chassis.
ManagedBy@odata.count	Number	True	An integer representing the number of items in a collection.
Drives(N)	Array	True	An array of references to the disk drives located in this Chassis. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.
Drives@odata.count	Number	True	An integer representing the number of items in a collection.

Storage(N)	Array	True	<p>An array of references to the storage subsystems connected to or inside this Chassis.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.</p>
Storage @odata.count	Number	True	An integer representing the number of items in a collection.
ResourceBlocks(N)	Array	True	<p>An array of references to the Resource Blocks located in this Chassis.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.</p>
ResourceBlocks @odata.count	Number	True	An integer representing the number of items in a collection.
ContainedBy(N)	Array	True	<p>A reference to the chassis that this chassis is contained by.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.</p>
Contains(N)	Array	True	<p>An array of references to any other chassis that this chassis has in it.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific</p>

			libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.
Contains @odata.count	Number	True	An integer representing the number of items in a collection.
PoweredBy(N)	Array	True	An array of ID[s] of resources that power this chassis. Normally the ID will be a chassis or a specific set of powerSupplies. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.
PoweredBy @odata.count	Number	True	An integer representing the number of items in a collection.
CooledBy(N)	Array	True	An array of ID[s] of resources that cool this chassis. Normally the ID will be a chassis or a specific set of fans. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.
CooledBy @odata.count	Number	True	An integer representing the number of items in a collection.
ManagersInChassis(N)	Array	True	An array of references to the managers located in this Chassis. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific

			libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.
ManagersInChassis@odata.count	Number	True	An integer representing the number of items in a collection.
Processors(N)	Array	True	An array of references to the Processors located in this Chassis. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Chassis under Platform specific Properties in "How to Add OEM extension" document.
Processors@odata.acount	Number	True	An integer representing the number of items in a collection.

3.26.2 PATCH

3.26.2.1 Request

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}

Content-Type: application/json

Example PATCH Request Body:

```
{
  "AssetTag": "abcd",
  "IndicatorLED": "Off"
}
```

Request Body

Please refer to the properties that are patchable in Table 43 Chassis Properties for which ReadOnly is False that can be sent as Request body in json format.

3.26.2.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.26.3 POST

3.26.3.1 Request

POST `https://{{ip}}/redfish/v1/Chassis/Self/Actions/Chassis.Reset`

Content-Type: application/json

Request Body

The ResetType can be one of the following values: "On", "ForceOff", "GracefulShutdown", "ForceRestart". Example POST Request Body:

```
{
  "ResetType": "On"
}
```

3.26.3.2 Response

The response status is 202 with below body.

```
{
  "@odata.context": "/redfish/v1/$metadata#Task.Task(TaskState,Description,Name,Id)",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_2.Task",
  "Description": "Task for Chassis Reset",
  "Id": "1",
  "Name": "Chassis Reset",
  "TaskState": "New"
}
```

Note: Using TaskID check the TaskStatus. Using MaintenanceWindowStartTime if Task is Cancelled due to invalid state Action then showing error message in Corresponding Tasks Using TaskID check the TaskStatus.

For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.27 Power

This resource shall be used to represent a power metrics resource for a Redfish implementation

3.27.1 GET

3.27.1.1 Request

`https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Power`

Content-Type: application/json

3.27.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 46 Power Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extension" document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
PowerControl (N)	Array	False	This is the definition for power control function (power reading/limiting). Refer Table 47 PowerControl Properties below.

PowerControl@odata.count	Number	True	An integer representing the number of items in a collection.
Voltages(N)	Array	True	This is the definition for voltage sensors. Refer Table 49Voltages Properties below.
Voltages@odata.count	Number	True	An integer representing the number of items in a collection.
PowerSupplies(N)	Array	False	Details of a power supplies associated with this system or device. Refer Table 50 PowerSupply Properties below. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
PowerSupplies@odata.count	Number	True	An integer representing the number of items in a collection.
Redundancy(N) (C)	Array	True	Redundancy information for the power subsystem of this system or device. Note: These properties can be configured through redis commands as specified in the Configurable Properties Section in "MegaRAC Redfish - How to Add OEM extension" document.
Redundancy@odata.count	Number	True	An integer representing the number of items in a collection.
Actions	Object	True	It contains Oem Object under Oem attribute under this Actions.

Table 47 PowerControl Properties

Name	Type	Read Only	Description
Name(C)	String	True	Power Control Function name.
MemberId	String	True	This is the identifier for the member within the collection.
PowerConsumedWatts	Number	True	The actual power being consumed (in Watts) by the chassis. Minimum Value : 0.

			Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.		
PowerRequestedWatts	Number	True	The amount of power (in Watts) that the chassis resource is currently requesting be budgeted to it for future use. Minimum Value : 0. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.		
PowerAvailableWatts	Number	True	The amount of power capacity (in Watts) not already allocated and shall equal PowerCapacityWatts - PowerAllocatedWatts. Minimum Value : 0. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.		
PowerCapacityWatts	Number	True	The total power capacity that is available for allocation to the chassis resources. Minimum Value : 0. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.		
PowerAllocatedWatts	Number	True	The total power currently allocated to chassis resources. Minimum Value : 0. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.		
PowerMetrics	Object	True	Power readings for this chassis. Note: DCMI should be supported in the platform and BMC.		
			Attribute	Type	Description
			IntervalInMin	Number	The time interval (or window) in which the PowerMetrics are measured over. Minimum

					Value:0 Note: The unit of IntervallnMin is Minute.
			MinConsumed Watts	Number	The lowest power consumption level over the measurement window (the last IntervallnMin minutes). Minimum Value:0
			MaxConsumed Watts	Number	The highest power consumption level that has occurred over the measurement window (the last IntervallnMin minutes). Minimum Value:0
			AverageConsumedWatts	Number	The average power level over the measurement window (the last IntervallnMin minutes). Minimum Value:0
PowerLimit	Object	False	Power limit status and configuration information for this chassis.		
			Attribute	Type	Description
			LimitInWatts	Number	The Power limit in watts. Minimum Value:0
			LimitException	String	The action that is taken if the power cannot be maintained below the LimitInWatts. Refer Table 48 Chassis PowerLimitExceptionEnum Properties. Default it will be null value
			CorrectionInMs	Number	The time required for the limiting process to reduce power consumption to below the limit. Default it will be null value
RelatedItem (C)	Array	True	The ID(s) of the resources associated with this Power Limit		
PhysicalContext (C)	Object	True	The value of this property shall be a description of the affected device or region within the chassis to which this voltage measurement applies.		

Table 48 Chassis PowerLimitExceptionEnum Properties

PowerLimitException	
Enum	Description
NoAction	Take no action when the limit is exceeded.
HardPowerOff	Turn the power off immediately when the limit is exceeded.
LogEventOnly	Log an event when the limit is exceeded, but take no further action.
Oem	Take an OEM-defined action.

Table 49 Voltages Properties

Name	Type	Read Only	Description
Name(C)	String	True	The name of the Voltage sensor.
MemberId	String	True	This property shall uniquely identify the member within the collection. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index. Note : The "@odata.id" identifier for the Voltage Sensors shall start with 0 and "MemberId" property shall have the same value as the identifier.
SensorNumber(C)	Number	True	A numerical identifier for this voltage sensor that is unique within this resource.
Status	Object	True	Refer Section 3.3 for Resource Oem.
ReadingVolts	Number	True	The current value of the voltage sensor.
UpperThresholdNonCritical(C)	Number	True	The current reading is above the normal range but is not critical. Units shall use the same units as the related ReadingVolts property
UpperThresholdCritical(C)	Number	True	The current reading is above the normal range but is not yet Fatal. Units shall use the same units as the related ReadingVolts property
UpperThresholdFatal(C)	Number	True	The value of this property shall indicate the CurrentReading is above the normal range and is fatal. Units shall use the same units as the related ReadingVolts property.

LowerThresholdNonCritical(C)	Number	True	The current reading is below the normal range but is not critical. Units shall use the same units as the related ReadingVolts property
LowerThresholdCritical(C)	Number	True	The current reading is below the normal range but is not yet fatal. Units shall use the same units as the related ReadingVolts property
LowerThresholdFatal(C)	Number	True	The value of this property shall indicate the CurrentReading is below the normal range and is fatal. Units shall use the same units as the related ReadingVolts property.
MinReadingRange	Number	True	The lowest possible value for CurrentReading. Units shall use the same units as the related ReadingVolts property. Note: Northbound is supported platform specific porting ; require specific platform libraries support and hook between the specific libraries and gami module should be added.
MaxReadingRange	Number	True	The highest possible value for CurrentReading. Units shall use the same units as the related ReadingVolts property. Note: Northbound is supported platform specific porting ; require specific platform libraries support and hook between the specific libraries and gami module should be added.
PhysicalContext(C)	Object	True	The affected device or region within the chassis to which this voltage measurement applies.(Refer Table 53 ThermalPhysicalContextEnum Properties) Note: These properties can be configured through redis commands as specified in the Configurable Properties Section in “MegaRAC Redfish - How to Add OEM extensions” document
RelatedItem(C)	Array	True	The ID(s) of the resources associated with this Power Limit.
OwnerLUN	Number	True	This is an OEM attribute and is a specific implementation of AMI. This attribute is used in combination with SensorNumber attribute to display the Sensors under the MetricProperties attribute under Telemetry Service MetricDefinitions URI. This attribute can be used to differentiate sensors with identical Sensor numbers but different LUN numbers.

Table 50 PowerSupply Properties

Name	Type	Read Only	Description	
Name(C)	String	True	The name of the PowerSupply.	
MemberId	String	True	This is the identifier for the member within the collection.	
PowerSupply Type(C)	String	True	The Power Supply type (AC or DC)	
			Enum	Description
			Unknown	The power supply type cannot be determined.
			AC	Alternating Current (AC) power supply.
			DC	Direct Current (DC) power supply.
			ACorDC	Power Supply supports both DC or AC.
LineInputVoltageType(C)	String	True	The LineInputVoltage at which the power supply is operating	
			Enum	Description
			Unknown	The power supply line input voltage type cannot be determined.
			ACLowLine	100-127V AC input. Deprecated: Use AC120V.
			ACMidLine	200-240V AC input. Deprecated: Use AC240V
			ACHighLine	277V AC input. Deprecated: Use AC277V.
			DCNeg48V	-48V DC input.
			DC380V	High Voltage DC input (380V)
			AC120V	AC 120V nominal input.
			AC240V	AC 240V nominal input.
			AC277V	AC 277V nominal input
			ACandDCWideRange	Wide range AC or DC input.
			ACWideRange	Wide range AC input.

			DC240V	DC 240V nominal input.
LineInputVoltage(C)	Number	True	The line input voltage at which the Power Supply is operating.	
PowerCapacityWatts	Number	True	The maximum capacity of this Power Supply. Minimum Value:0.	
LastPowerOutputWatts	Number	True	The average power output of this Power Supply (in Watts). Minimum Value:0.	
Model (C)	String	True	The model number for this Power Supply.	
FirmwareVersion	String	True	The firmware version for this Power Supply.	
SerialNumber	String	True	The serial number for this Power Supply	
PartNumber(C)	String	True	The part number for this Power Supply.	
SparePartNumber(C)	String	True	The spare part number for this Power Supply.	
Status	Object	True	Refer Section 3.3 for Resource.Oem.	
Location (M)	Array	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource.Location.	
PowerInputWatts	Number	True	This property shall contain the value of the measured input power, in Watts, of the associated power supply.	
PowerOutputWatts	Number	True	This property shall contain the value of the measured output power, in Watts, of the associated power supply.	
EfficiencyPercent	Number	True	This property shall contain the value of the measured power efficiency, as a percentage, of the associated power supply.	
HotPluggable	Boolean	True	The value of this property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot- pluggable.	

RelatedItem (C)	Array	True	The ID(s) of the resources associated with this Power Limit
Redundancy (C)	Array	True	This structure is used to show redundancy for power supplies. The Component ids will reference the members of the redundancy groups. Note: Redundancy information can be configured through redis commands as specified in the Configurable Properties Section in “MegaRAC Redfish - How to Add OEM extensions” document

3.27.2 PATCH

3.27.2.1 Request

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Power

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 46 Power Properties for which ReadOnly is False that can be sent as Request body in json format.

3.27.2.2 Response

The response status is success with status code as 200 with GET response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.28 Thermal

This resource shall be used to represent a thermal metrics resource for a Redfish implementation.

3.28.1 GET

3.28.1.1 Request

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Thermal

Content-Type: application/json



3.28.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Note: The Unit for threshold values for Fan is RPM.

Table 51 Thermal Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extensions " document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Temperatures	Array of Objects	True	This is the definition for temperature sensors. Refer Table 52 Temperature Properties.
Fans	Array of Objects	True	This is the definition for fans. Refer Table 54 Fan Properties.
Redundancy(N) (C)	Array	True	This structure is used to show redundancy for fans. The Component ids will reference the members of the redundancy groups. Note: Redundancy information can be configured through redis commands as specified in the Configurable Properties Section in - "MegaRAC Redfish - How to Add OEM extension" document.
Actions	Object	True	It will contain actions under Oem attribute if any.

Table 52 Temperature Properties

Name	Type	Read Only	Description
Name(C)	String	True	The name of the Temperature sensor.
MemberId	String	True	This property shall uniquely identify the member within the collection. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index. Note : The "@odata.id" identifier for the Temperature Sensors shall start with 0 and "MemberId" property shall have the same value as the identifier.
SensorNumber(C)	Number	True	A numerical identifier for this temperature sensor that is unique within this resource.
Status	Object	True	Refer Section 3.3 for Resource.Oem.
ReadingCelsius	Number	True	The current value of the temperature sensor's reading
UpperThresholdNonCritical(C)	Number	True	The current reading is above the normal range but is not critical. Units shall use the same units as the related ReadingCelsius property
UpperThresholdCritical(C)	Number	True	The current reading is above the normal range but is not yet Fatal. Units shall use the same units as the related ReadingCelsius property
UpperThresholdFatal (C)	Number	True	The current reading is above the normal range and is fatal. Units shall use the same units as the related ReadingCelsius property
LowerThresholdNonCritical (C)	Number	True	The current reading is below the normal range but is not critical. Units shall use the same units as the related ReadingCelsius property
LowerThresholdCritical (C)	Number	True	The current reading is below the normal range but is not yet fatal. Units shall use the same units as the related ReadingCelsius property
LowerThresholdFatal (C)	Number	True	The value of this property shall indicate the present reading is below the normal range and is fatal. Units shall use the same units as the related ReadingCelsius property.
MinReadingRangeTemp	Number	True	The lowest possible value for CurrentReading. Units shall use the same units as the related ReadingCelsius property.

MaxReadingRangeTemp	Number	True	The highest possible value for CurrentReading. Units shall use the same units as the related ReadingCelsius property.
PhysicalContext (C)	Object	True	The affected device or region within the chassis to which this Temperature measurement applies. Refer Table 53 ThermalPhysicalContextEnum Properties. Note: This property can be configured through redis commands as specified in the Configurable Properties Section in "MegaRAC Redfish - How to Add OEM extensions" document . If it is not configured then the default value will be set to this property. i.e., Room
RelatedItem(C)	Array	True	The ID(s) of the resources associated with this Power Limit
DeltaReadingCelsius	Number	True	The value of this property shall be the delta of the values of the temperature readings across this sensor and the sensor at DeltaPhysicalContext. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
DeltaPhysicalContext	Enum	True	The value of this property shall be a description of the affected device or region within the chassis to which the DeltaReadingCelsius temperature measurement applies, relative to PhysicalContext. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
MaxAllowableOperatingValue	Number	True	The value of this property shall indicate the maximum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.

MinAllowableOperatingValue	Number	True	<p>The value of this property shall indicate the minimum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination.</p> <p>Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>
AdjustedMaxAllowableOperatingValue	Number	True	<p>The value of this property shall indicate the adjusted maximum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination, and adjusted based on environmental conditions present. For example, liquid inlet temperature may be adjusted based on the available liquid pressure.</p> <p>Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>
AdjustedMinAllowableOperatingValue	Number	True	<p>The value of this property shall indicate the adjusted minimum allowable operating temperature for the equipment monitored by this temperature sensor, as specified by a standards body, manufacturer, or a combination, and adjusted based on environmental conditions present. For example, liquid inlet temperature may be adjusted based on the available liquid pressure.</p> <p>Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>
OwnerLUN	Number	True	<p>This is an OEM attribute and is a specific implementation of AMI. This attribute is used in combination with Sensor Number attribute to display the Sensors under the Metric Properties attribute under Telemetry Service Metric Definitions URI. This attribute can be used to differentiate sensors with identical Sensor numbers but different LUN numbers.</p>

Table 53 ThermalPhysicalContextEnum Properties

PhysicalContext	
Enum	Description
Room	The room
Intake	The intake point of the chassis
Exhaust	The exhaust point of the chassis
Front	The front of the chassis.
Back	The back of the chassis.
Upper	The upper portion of the chassis
Lower	The lower portion of the chassis
CPU	A Processor (CPU).
GPU	A Graphics Processor (GPU).
Backplane	A backplane within the chassis
SystemBoard	The system board (PCB).
PowerSupply	A power supply.
VoltageRegulator	A voltage regulator device
StorageDevice	A storage device
NetworkingDevice	A networking device.
ComputeBay	Within a compute bay
StorageBay	Within a storage bay.
NetworkBay	Within a networking bay.
ExpansionBay	Within an expansion bay
PowerSupplyBay	Within a power supply bay

Table 54 Fan Properties

Name	Type	Read Only	Description
MemberId	String	True	This property shall uniquely identify the member within the collection. For services supporting Redfish v1.6 or higher, this value shall contain the zero-based array index. Note: The "odata.id" identifier for the Fan Sensors shall start with 0 and "MemberId" property shall have the same value as the identifier.
Name(C)	String	True	The name of the Fan.
PhysicalContext (C)	Object	True	The affected device or region within the chassis to which this Temperature measurement applies. Refer Table 53 ThermalPhysicalContextEnum Properties.
Status	Object	True	Refer Section 3.3 for Resource.Oem.
Reading	Number	True	The current value of the fan sensor's reading.
UpperThresholdNonCritical(C)	Number	True	The current reading is above the normal range but is not critical. Units shall use the same units as the related Reading property
UpperThresholdCritical(C)	Number	True	The current reading is above the normal range but is not yet Fatal. Units shall use the same units as the related Reading property
UpperThresholdFatal(C)	Number	True	The current reading is above the normal range and is fatal. Units shall use the same units as the related Reading property
LowerThresholdNonCritical (C)	Number	True	The current reading is below the normal range but is not critical. Units shall use the same units as the related Reading property
LowerThresholdCritical (C)	Number	True	The current reading is below the normal range but is not yet fatal. Units shall use the same units as the related Reading property
LowerThresholdFatal (C)	Number	True	The value of this property shall indicate the present reading is below the normal range and is fatal. Units shall use the same units as the related Reading property.
MinReadingRange	Number	True	The lowest possible value for Reading. Units shall use the same units as the related Reading property.

			Note: Northbound is supported platform specific porting ; require specific platform libraries support and hook between the specific libraries and gami module should be added.
MaxReading Range	Number	True	The highest possible value for Reading. Units shall use the same units as the related Reading property. Note: Northbound is supported platform specific porting ; require specific platform libraries support and hook between the specific libraries and gami module should be added.
RelatedItem (C)	Array	True	The ID(s) of the resources serviced with this fan.
Redundancy (C)	Array	True	Redundancy information for the power subsystem of this system or device. Note: Redundancy information can be configured through redis commands as specified in the Configurable Properties Section in "MegaRAC Redfish - How to Add OEM extensions" document
HotPluggable	Boolean	True	The value of this property shall indicate whether the device can be inserted or removed while the underlying equipment otherwise remains in its current operational state. Devices indicated as hot-pluggable shall allow the device to become operable without altering the operational state of the underlying equipment. Devices that cannot be inserted or removed from equipment in operation, or devices that cannot become operable without affecting the operational state of that equipment, shall be indicated as not hot-pluggable. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
Location	Array	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource Location. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.

SensorNumber	Number	True	A numerical identifier to represent the fan speed sensor.
OwnerLUN	Number	True	This is an OEM attribute and is a specific implementation of AMI. This attribute is used in combination with SensorNumber attribute to display the Sensors under the MetricProperties attribute under Telemetry Service MetricDefinitions URI. This attribute can be used to differentiate sensors with identical Sensor numbers but different LUN numbers.

3.29 Manager Collection

This resource shall be used to represent a collection of managers.

3.29.1 GET

3.29.1.1 Request

`https://{{ip}}/redfish/v1/Managers`

Content-Type: application/json

3.29.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.30 Manager

This is the schema definition for a Manager. Examples of managers are BMCs, Enclosure Managers, Management Controllers and other subsystems assigned manageability functions.

3.30.1 GET

3.30.1.1 Request

`https://{{ip}}/redfish/v1/Managers/{{manager_instance}}`

Content-Type: application/json

3.30.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 55 Manager Properties

Name	Type	Read Only	Description			
@odata.context	String	True	Refer Section 3.1			
@odata.id	String	True	Refer Section 3.1			
@odata.type	String	True	Refer Section 3.1			
@odata.etag	String	True	Refer Section 3.1			
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extension" document.			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
ManagerType	String	True	An enumeration property that represents the type of manager that this resource represents.			
			Enum	Description		
			BMC	A controller which provides management functions for a single computer system.		
Links	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource			
			Name	Type	Read Only	Description
			ManagerForServers(N)	Array	True	An array of references to the systems that this manager has control over. Note: Platform specific porting needed; require

						specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Manager - Links under Platform specific Properties in "How to Add OEM extension" document.
			ManagerForServers@odata.count	Number	True	An integer representing the number of items in a collection.
			ManagerForSwitches(N)			An array of references to the switches that this manager has control over. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Manager - Links under Platform specific Properties in "How to Add OEM extension" document.
			ManagerForSwitches@odata.c	Number	True	An integer representing the number of items in a collection.



			ount			
			ManagerForChassis@odata.count	Number	True	An integer representing the number of items in a collection.
			ManagerForChassis(N)	Array	True	An array of references to the chassis that this manager has control over. Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added. Please refer Manager - Links under Platform specific Properties in "How to Add OEM extension" document.
			ManagerInChassis(N)	Array	True	This property shall contain a reference to the chassis that this manager is located in.
			ActiveSoftwareImage(N)	Array	True	This property shall contain a link to the Software Inventory Resource that represent the active firmware image for this manager.
			ActiveSoftwareImage@odata.count	Number	True	An integer representing the number of items in a collection.
			SoftwareImages(N)	Array	True	This property shall contain an array of links to the



						Software Inventory Resources that represent the firmware images that apply to this manager.
			SoftwareImages@odata.count	Number	True	An integer representing the number of items in a collection.
ServiceEntryPointUUID	String	True	The UUID of the Redfish Service provided by this manager. Refer Table 11 Resource Type Definitions.			
UUID	String	True	The Universal Unique Identifier (UUID) for this Manager. Refer Table 11 Resource Type Definitions.			
Model	String	True	Model number of this manager as defined by the manufacturer.			
DateTime	String	False	The current Date Time (with offset) for the manager, used to set or read time. Note: The valid range is -12:00 to +14:00. Please refer the following link for the allowable values within the above specified range. https://en.wikipedia.org/wiki/List_of_UTC_time_offsets			
DateTimeLocalOffset	String	False	The time offset from UTC that the Date Time property is set to in format: +06:00. Note: The valid range is -12:00 to +14:00. Please refer the following link for the allowable values within the above specified range. https://en.wikipedia.org/wiki/List_of_UTC_time_offsets			
FirmwareVersion	String	True	The firmware version of this Manager.			
SerialConsole	Object		Information about the Serial Console service provided by this manager. Refer Table 56 SerialConsole Properties.			
CommandShell	Object		Information about the Command Shell service provided by this manager. Refer Table 57 CommandShell Properties.			
GraphicalConsole	Object		The information about the Graphical Console (KVM-IP) service of this manager. Refer Table 58 GraphicalConsole Properties.			
Actions	Object	True	Managers allows the user to perform Actions like Reset.			

			It can also contain an Oem Object under this Actions if any.
Status	Object	True	Refer Section 3.3 for Resource.Oem.
EthernetInterfaces(N)	Object	True	a reference to a collection of NICs that this manager uses for network communication. It is here that clients will find NIC configuration options and settings.
SerialInterfaces(N)	Object	True	A reference to a collection of serial interfaces that this manager uses for serial and console communication. It is here that clients will find serial configuration options and settings.
NetworkProtocol(N)	Object	True	A reference to the network services and their settings that the manager controls. It is here that clients will find network configuration options as well as network services.
LogServices(N)	Object	True	A reference to a collection of Logs used by the manager.
VirtualMedia(N)	Object	True	A reference to the Virtual Media services for this particular manager. Note: Link will be present only when Virtual Media is enabled in the Manager, BMC in this case.
Redundancy(N)(C)	Array	True	Redundancy information for the managers of this system. Note: Please refer Section 4 for Redundancy information that can be configured. Northbound only available and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
Redundancy@odata.count	Number	True	An integer representing the number of items in a collection.
HostInterfaces(N)			This is a reference to a collection of Host Interfaces that this manager uses for local host communication. It is here that clients will find Host Interface configuration options and settings.
AutoDSTEnabled	Boolean	True	The value of this property shall contain the enabled status of the automatic Daylight Saving Time (DST) adjustment of the manager's DateTime. It shall be true if Automatic DST adjustment is enabled and false if disabled. Note: Northbound only supported. Platform specific porting needed; require specific platform libraries support and hook

			between the specific libraries and gami module should be added.
PowerState	String	True	The value of this property shall contain the power state of the Manager.
RemoteAccountService	Object	True	A reference to the AccountService resource for the remote Manager represented by this resource.
RemoteRedfishServiceUri	Object	True	A reference the URI of the Redfish Service Root for the remote Manager represented by this resource.

Table 56 SerialConsole Properties

Name	Type	Read Only	Description	
ServiceEnabled	Boolean	False	<p>Indicates if the service is enabled for this manager.</p> <p>Note:</p> <p>This property will be true if any one of the protocol is enabled in the ConnectTypesSupported.</p> <p>IPMI-SOL service can be enabled or disabled in BMC. Hence all the available services (IPMISOL, SOLSSH, Telnet) will be disabled/enabled as per user's input.</p>	
MaxConcurrentSessions	String	True	<p>Indicates the maximum number of concurrent service sessions supported by the implementation regardless of protocol. Minimum Value:0.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>	
ConnectTypesSupported	Array	True	The value of ConnectTypesSupported shall be an array of the enumerations provided here.	
			Enum	Description
			Telnet	The controller supports a Serial Console connection using the Telnet protocol.

				Note: Telnet support is based on the AMI SPX based Firmware support.
			IPMI	The controller supports a Serial Console connection using the IPMI Serial-over-LAN (SOL) protocol.
			Oem	The controller supports a Serial Console connection using an OEM-specific protocol.

Table 57 CommandShell Properties

Name	Type	Read Only	Description
ServiceEnabled	Boolean	False	<p>Indicates if the service is enabled for this manager.</p> <p>Note:</p> <p>This property will be true if any one of the protocol is enabled in the ConnectTypesSupported.</p> <p>If IPMI is present in ConnectTypesSupported then CommandShell cannot be disabled.</p> <p>If IPMI is not present, then this property will be true if any one of the services in the ConnectTypesSupported is Enabled.</p> <p>If this property is patched to true, then all the other services in ConnectTypesSupported will be enabled.</p>
MaxConcurrentSessions	String	True	<p>Indicates the maximum number of concurrent service sessions supported by the implementation regardless of protocol. Minimum Value:0.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p> <p>Note: The number of SSH MaxConcurrentSessions update based the BMC runtime performance and there is no API hook for getting the detail. So the default MaxConcurrentSessions of ComandShell based on the IPMI max concurrent session to display.</p>

ConnectTypesSupported	Array	True	The value of ConnectTypesSupported shall be an array of the enumerations provided here.	
			Enum	Description
			SSH	The controller supports a CommandShell connection using the SSH protocol. Note: There is no limit for SSH sessions and maximum session is not applicable
			Telnet	The controller supports a CommandShell connection using the Telnet protocol. Note: Telnet support is based on the AMI SPX based Firmware support.
			IPMI	The controller supports a CommandShell connection using the IPMI protocol.
Oem	The controller supports a CommandShell connection using an OEM-specific protocol.			

Table 58 GraphicalConsole Properties

Name	Type	Read Only	Description	
ServiceEnabled	Boolean	False	Indicates if the service is enabled for this manager.	
MaxConcurrentSessions	String	True	Indicates the maximum number of concurrent service sessions supported by the implementation regardless of protocol. Minimum Value:0.	
ConnectTypesSupported	Array	True	This object is used to enumerate the Graphical Console connection types allowed by the implementation.	
			Enum	Description
			KVMIP	The controller supports a Graphical Console connection using a KVM-IP



				(redirection of Keyboard, Video, Mouse over IP) protocol.
			Oem	The controller supports a Graphical Console connection using an OEM-specific protocol.

3.30.2 PATCH

3.30.2.1 Request

https://{{ip}}/redfish/v1/Managers/{{manager_instance}}

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 55 Manager Properties for which ReadOnly is False that can be sent as Request body in json format.

3.30.2.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.30.3 POST

3.30.3.1 Request

POST https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/

Actions/Manager.Reset

Content-Type: application/json

Request Body

The only valid value for ResetType is ForceRestart, which will do a cold reset of the BMC.

Example POST Request Body:

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

3.30.3.2 Response

The response status is 202 with below body. Check BMC restarting logs in BMC console, wait for few seconds for BMC restarting.

For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

```
{
  "@odata.context":
  "/redfish/v1/$metadata#Task.Task(TaskState,Description,Name,Id)",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_2_0.Task",
  "Description": "Task for Manager Reset",
  "Id": "1",
  "Name": "Manager Reset",
  "TaskState": "New"
}
```

3.31 ManagerNetworkProtocol

This resource is used to obtain or modify the network services managed by a given manager.

Note: To get VMedia& KVM Ports when encryption is disabled, make sure "Allow Non-secure communication" option under KVM in PRJ is enabled to allow the user to disable encryption.

3.31.1 GET

3.31.1.1 Request

`https://ip/redfish/v1/Managers/Self/NetworkProtocol`

Content-Type: application/json

3.31.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 59 ManagerNetworkProtocolProperties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” documents.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
HostName	String	True	The DNS Host Name of this manager, without any domain information.
FQDN	String	True	This is the fully qualified domain name for the manager obtained by DNS including the host name and top-level domain name.
HTTPS	Object	False	This object shall contain information for the HTTPS/SSL protocol settings for this manager. The default value of the Port property should be 443 for compatibility with established client implementations. Refer Table 60 Protocol Properties.
SNMP	Object	True	This object shall contain information for the SNMP protocol settings for this manager. The default value of the Port property should be 161 for compatibility with established client implementations. Refer Table 60 Protocol Properties below. Note: ProtocolEnabled and Port fields for this cannot be modified because of limitations in the BMC.

VirtualMedia	Object	False	<p>This object shall contain information for the Virtual Media protocol settings for this manager. The value of the Port property shall contain the TCP port assigned for Virtual Media usage. Refer</p> <p>Table 60 Protocol Properties below.</p> <p>Note: This property is not patchable when Single Port App feature is enabled in ASUS BMC.</p> <p>VirtualMedia maps to cd-media in ASUS BMC.</p>
Telnet	Object	False	<p>This object shall contain information for the Telnet protocol settings for this manager. The default value of the Port property should be 23 for compatibility with established client implementations. Refer</p> <p>Table 60 Protocol Properties below.</p> <p>Note: Telnet support is based on the AMI SPX based Firmware support. Please check SPX Firmware Release Document for Telnet feature support.</p>
SSDP	Object	False	<p>This object shall contain information for the SSDP protocol setting for this manager. Simple Service Discovery Protocol (SSDP) is for network discovery of devices supporting the Redfish service. The default value of the Port property should be 1900 for compatibility with established client implementations. Refer Table 61 SSDP Protocol Properties below.</p> <p>Note: Northbound only supported. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>
IPMI	Object	False	<p>This object shall contain information for the IPMI over LAN protocol settings for the manager. The default value of the Port property should be 623 for compatibility with established client implementations. Refer</p> <p>Table 60 Protocol Properties below.</p> <p>Note: Port fields for this property cannot be modified because of limitations in the BMC.</p>

			ProtocolEnabled property will be update to true/false based on IPMI-Over-LAN is modified (Enabled/Disabled) through BMC-Web or through IPMI-commands or PATCH call.			
SSH	Object	False	This object shall contain information for the SSH protocol settings for the manager. The default value of the Port property should be 22 for compatibility with established client implementations. Refer Table 60 Protocol Properties.			
KVMIP	Object	False	This object shall contain information for the KVM-IP (Keyboard, Video, Mouse) protocol settings for the manager. Refer Table 60 Protocol Properties below. Note: The Port field for this protocol is read only when single port app is enabled.			
Status	Object	True	Refer Section 3.3 for Resource.Oem.			
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			
NTP	Object	False	This object shall contain information for the NTP protocol settings for the manager.			
			Name	Type	Read Only	Description
			ProtocolEnabled	Boolean	False	Indicates if the protocol is enabled or disabled. Default it will be null value
			Port	Number	False	Indicates the protocol port. Default it will be null value Note: Fixed port number 123 for BMC ntpd.
			NTPServers	Array	False	Indicates to which NTP servers this manager is subscribed. Default it will be null value Note: Only support two NTP Server domain names in NTPServers array.

Table 60 Protocol Properties

Name	Type	Read Only	Description
ProtocolEnabled	Boolean	False	Indicates if the protocol is enabled or disabled. Default it will be null value
Port	Number	True	Indicates the port assigned for the protocol. Default it will be null value Note: Value of the Port can take any value between 1 and 65535.

Table 61 SSDP Protocol Properties

Name	Type	Read Only	Description
ProtocolEnabled	Boolean	False	Indicates if the protocol is enabled or disabled.
Port	Number	False	Indicates the port assigned for the protocol. Minimum Value:0. Note: Value of the Port can take any value between 1 and 65535.

3.31.2 PATCH

3.31.2.1 Request

<https://ip/redfish/v1/Managers/Self/NetworkProtocol>

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 59

ManagerNetworkProtocolProperties for which ReadOnly is False that can be sent as Request body in json format.

3.31.2.2 *Response*

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.32 SerialInterfaceCollection

This schema defines an asynchronous collection of serial interface resource. This resource shall be used to represent serial resources as part of the Redfish specification.

3.32.1 GET

3.32.1.1 *Request*

https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/SerialInterfaces

Content-Type: application/json

3.32.1.2 *Response*

Please refer [Section 3.5](#) for the JSON response properties.

3.33 SerialInterface

This schema defines an asynchronous serial interface resource. This resource shall be used to represent serial resources as part of the Redfish specification.

Note: IPMI-SOL is the only supported manager_serialifc_instance in this version. This link will be shown only when IPMISOL is enabled and the baud rate can be retrieved from IPMI.

3.33.1 GET

3.33.1.1 *Request*

https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/SerialInterfaces/IPMI-SOL

Content-Type: application/json

3.33.1.2 *Response*

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 62 Serial Interface Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Interface Enabled	Boolean	False only for IPMI-SOL	This indicates whether this interface is enabled. Default it will be null value
BitRate	String	False only for IPMI-SOL	The receive and transmit rate of data flow, typically in bits-per-second (bps), over the serial connection and can take any one of the following enum values. "emmu ": ["9600", "19200", "38400", "57600", "115200] Note: BitRate property for Serial Interface in Redfish maps to the non-volatile bit rate setting of IPMI SOL.

Parity	String	True	<p>The type of parity used by the sender and receiver in order to detect errors over the serial connection. It can take any one of the following enum values :-</p> <p>"enum": ["None", "Even", "Odd", "Mark", "Space"]</p>
SignalType (C)	String	True	<p>The type of signal used for the communication connection</p> <p>- RS232 or RS485.</p> <p>"enum": ["Rs232","Rs485"]</p> <p>Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extension" document. in section 2.21.</p>
ConnectorType (C)	String	True	<p>The type of connector used for this interface.</p> <p>"enum":</p> <p>[</p> <p style="padding-left: 40px;">"RJ45.",</p> <p style="padding-left: 40px;">"RJ11.",</p> <p style="padding-left: 40px;">"DB9 Female.",</p> <p style="padding-left: 40px;">"DB9 Male.",</p> <p style="padding-left: 40px;">"DB25 Female.", "DB25 Male.",</p> <p style="padding-left: 40px;">"USB.",</p> <p style="padding-left: 40px;">"mUSB.",</p> <p style="padding-left: 40px;">"uUSB."</p> <p>]</p> <p>Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extension" document. in section 2.21.</p>
PinOut (C)	String	True	<p>The physical pin configuration needed for a serial connector.</p> <p>"enum":</p> <p>[</p> <p style="padding-left: 40px;">"Cisco",</p> <p style="padding-left: 40px;">"Cyclades",</p> <p style="padding-left: 40px;">"Digi"</p>

] Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extension" document. in section 2.21.	
DataBits	String	True	The number of data bits that will follow the start bit over the serial connection. enum : [5 , 6 , 7 , 8]	
StopBits	String	True	The period of time before the next start bit is transmitted. "enum": ["1", "2"]	
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.	
FlowControl	String	True	The type of flow control, if any, that will be imposed on the serial connection.	
			Enum	Description
			None	No flow control imposed
			Software	XON/XOFF in-band flow control imposed
			Hardware	Out of band flow control imposed

3.33.2 PATCH

3.33.2.1 Request

PATCH https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/SerialInterfaces/{{manager_serialifc_instance}}

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 62 Serial Interface Property for which ReadOnly is False that can be sent as Request body in json format.

Note:

- According to IPMI SPEC, Serial communication with the BMC when SOL is activated always occurs using 8bits/character, no parity, 1 stop bit, and RTS/CTS (hardware) flow control. Hence the properties Parity, DataBits, StopBits and FlowControl are not patchable when the manager_serialifc_instance is IPMI_SOL.
- Patch is not Supported for serialinterface instances other than IPMI-SOL.



Example PATCH Request Body:

```
{
  "BitRate": "9600",
  "InterfaceEnabled": false
}
```

3.33.2.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.34 VirtualMediaCollection

AMI's RMedia feature redirected images and CD instances will be shown in this list

Virtual Media Members will be shown to the user only when VirtualMedia is enabled in BMC. ProtocolEnabled property for VirtualMedia in ManagerNetworkProtocol should have the value as "true".

Notes :

This feature is not supported in SPX-13.0 RTP 1.8 release as VirtualMedia is not enabled.

Only CD Image Redirection is supported in Redfish

For When CD media redirection is initiated, the response of VirtualMedia collection will be refreshed / updated. The CD Media, for which redirection is in progress will be assigned to the first CD instance (say CD1) in VirtualMedia collection.

For Example, Virtual Media collection has four CD instances (CD1, CD2, CD3, CD4) and all the instances are free. If the user execute InsertMedia action using CD4 instance, after the success operation, the redirected device will be assigned to CD1 instance (i.e. CD1 inserted property value will be true). The order of the CD instances will be similar to BMC Web UI.

3.34.1 GET

3.34.1.1 Request

`https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/VirtualMedia`

Content-Type: application/json

3.34.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.35 VirtualMedia

This is the schema definition for the Virtual Media Service. This resource shall be used to represent a virtual media service for a Redfish implementation

User can initiate CD media redirection using InsertMedia action and can stop the redirection using EjectMedia action.

Note:

This feature is not supported in SPX-13.0 RTP 1.8 release as VirtualMedia is not enabled.

This link will be shown to the user only when VirtualMedia CD instance is redirected from Remote Media from BMC Webpage.

KVM VMedia will not be listed in Redfish VMedia Instance when redirected through KVM.

3.35.1 GET

3.35.1.1 Request

`https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/VirtualMedia/{{virtualmedia_instance}}`

Content-Type: application/json

3.35.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 63 Virtual Media Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1

@odata.etag	String	True	Refer Section 3.1										
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document										
Id(M)	String	True	Resource Identifier										
Name(M)	String	True	Name of the Resource										
Description	String	True	Provides description of the resource. Refer Section 3.3										
ImageName	String	True	The current image name.										
Image	String	True	A URI providing the location of the selected image.										
ConnectedVia	String	True	The value of this property shall indicate the current connection method from a client to the virtual media represented by this resource. A value of NotConnected shall indicate no connection is present. A value of URI shall indicate that a remote connection via a URI reference type is being used. Note "NotConnected" and "URI" enums are only supported for now.										
			<table border="1"> <thead> <tr> <th>Enum</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>NotConnected</td> <td>No current connection</td> </tr> <tr> <td>URI</td> <td>Connected to a URI location</td> </tr> <tr> <td>Applet</td> <td>Connected to a client application</td> </tr> <tr> <td>Oem</td> <td>Connected via an OEM-defined method</td> </tr> </tbody> </table>	Enum	Description	NotConnected	No current connection	URI	Connected to a URI location	Applet	Connected to a client application	Oem	Connected via an OEM-defined method
Enum	Description												
NotConnected	No current connection												
URI	Connected to a URI location												
Applet	Connected to a client application												
Oem	Connected via an OEM-defined method												
Inserted	Boolean	True	Indicates if virtual media is inserted in the virtual device. This is usually only applicable to remoting of devices and not for image virtual media usage. Note : When the redirection is initiated for a CD instance, then the Inserted property value of that instance would be true.										
WriteProtected	Boolean	True	Indicates the media is write protected. Note: For CD instance, the WriteProtected value is always true										
Actions	Object	True	EjectMedia - This action is used to detach remote media from virtual media.										

			<p>InsertMedia - This action is used to attach remote media to virtual media.</p> <p>This action object will also contain the actions for this resource under Oem property if any.</p>																												
			<table border="1"> <thead> <tr> <th>ActionName</th> <th>Property</th> <th>Type</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>InsertMedia</td> <td>Image</td> <td>string</td> <td>The URI of the remote media to attach to the virtual media.</td> </tr> <tr> <td></td> <td>Inserted</td> <td>boolean</td> <td>Indicates if the image is to be treated as inserted upon completion of the action. Note : Inserted value should be true.</td> </tr> <tr> <td></td> <td>TransferMethod</td> <td>string</td> <td>Transfer method to use with the given Image. Note: The allowed value for this property is "Stream"</td> </tr> <tr> <td></td> <td>TransferProtocolType</td> <td>string</td> <td>Network protocol to use with the image. Note: The allowed values for this property is "NFS" and "CIFS"</td> </tr> <tr> <td></td> <td>WriteProtected</td> <td>string</td> <td>Indicates if the remote media is supposed to be treated as write protected. Note: For CD instance, WriteProtected value is always true</td> </tr> <tr> <td></td> <td>UserName</td> <td>string</td> <td>The user name to access the Image parameter-specified URI. Note: This is a required property for "CIFS" protocol</td> </tr> </tbody> </table>	ActionName	Property	Type	Description	InsertMedia	Image	string	The URI of the remote media to attach to the virtual media.		Inserted	boolean	Indicates if the image is to be treated as inserted upon completion of the action. Note : Inserted value should be true.		TransferMethod	string	Transfer method to use with the given Image. Note: The allowed value for this property is "Stream"		TransferProtocolType	string	Network protocol to use with the image. Note: The allowed values for this property is "NFS" and "CIFS"		WriteProtected	string	Indicates if the remote media is supposed to be treated as write protected. Note: For CD instance, WriteProtected value is always true		UserName	string	The user name to access the Image parameter-specified URI. Note: This is a required property for "CIFS" protocol
ActionName	Property	Type	Description																												
InsertMedia	Image	string	The URI of the remote media to attach to the virtual media.																												
	Inserted	boolean	Indicates if the image is to be treated as inserted upon completion of the action. Note : Inserted value should be true.																												
	TransferMethod	string	Transfer method to use with the given Image. Note: The allowed value for this property is "Stream"																												
	TransferProtocolType	string	Network protocol to use with the image. Note: The allowed values for this property is "NFS" and "CIFS"																												
	WriteProtected	string	Indicates if the remote media is supposed to be treated as write protected. Note: For CD instance, WriteProtected value is always true																												
	UserName	string	The user name to access the Image parameter-specified URI. Note: This is a required property for "CIFS" protocol																												

				Pass word	string	The password to access the Image parameter- specified URI. Note: This is a required property for "CIFS" protocol
			EjectMedia	-	-	Empty parameter should be given as request data
MediaType	Array	True	The values of this array shall be the supported media types for this connection. Note: Only CD MediaType is supported in Redfish			
			Enum	Description		
			CD	A CD-ROM format (ISO) image.		
TransferProtocolType	String	True	Network protocol to use with the image.			
			Enum	Description		
			NFS	Network File System protocol.		
			CIFS	Common Internet File System.		
TransferMethod	String	True	Transfer method to use with the given Image. Note: Only Stream TransferMethod is supported in Redfish			
			Enum	Description		
			Stream	Stream image file data from the source URI		
UserName	String	True	The user name to access the Image parameter-specified URI.			

3.35.2 POST [Initiating CD Media Image Redirection]

- Make sure RMedia configuration is enabled in BMC.
- If not, enable it through Web UI.

Note: This action is not supported in SPX-13.0 RTP 1.8 release as VirtualMedia is not enabled.

3.35.2.1 Request

```
POST    {{http_protocol}}://{{ip}}/redfish/v1/Managers/Self/VirtualMedia/
        {{CD_instance}}/Actions/VirtualMedia.InsertMedia
```

Content-Type: application/json

Sample POST request using NFS Method:

```
{
  "Image": "//10.0.125.169/home/tamil/images/images/ubuntu-14.04.1-desktop-
amd64.iso",
  "TransferProtocolType": "NFS"
}
```

Sample POST request using CIFS Method:

```
{
  "Image": "//<sys_ip>/home/test/images/javatools.iso",
  "TransferProtocolType": "CIFS",
  "UserName": "<sys_username>",
  "Password": "<sys_password>"
}
```

3.35.2.2 Response

For success, the response status is 202 with message body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

```
{
  "@odata.context":
  "/redfish/v1/$metadata#Task.Task(Description,TaskState,Name,Id)",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_2.Task",
  "Description": "Task for InsertMedia Action",
  "Id": "1",
  "Name": "InsertMedia Action",
  "TaskState": "New"
}
```

Note:

After a successful post call, using the TaskID check the TaskState in “/redfish/v1/TaskService/Tasks/<taskid>” and verify the value of “RedirectionStatus” OEM property in GET “/redfish/v1/Managers/Self/VirtualMedia/<cd_instance>”

If the Task is aborted due to an error, “TaskState” property value will be “Exception” and appropriate error message will be displayed in the response of the Corresponding Task “/redfish/v1/TaskService/Tasks/<taskid>”.

3.35.3 POST [Ejecting CD Media Image Redirection]

Note: This action is not supported in SPX-13.0 RTP 1.8 release as VirtualMedia is not enabled.

3.35.3.1 Request

```
POST      {{http_protocol}}://{{ip}}/redfish/v1/Managers/Self/VirtualMedia/
          {{CD_instance}}/Actions/VirtualMedia.EjectMedia
```

Content-Type: application/json

Example POST Request:

```
{}
```

3.35.3.2 Response

The response status is 204

3.36 Account Service

This resource shall be used to represent a management account service for a Redfish implementation. Allows user to create multiple account with different roles and privileges.

Note: The maximum limit for accounts is 14. If disabled the Unified User Account Feature, the maximum limit for accounts would be 20.)

3.36.1 GET

3.36.1.1 Request

```
https://{{ip}}/redfish/v1/AccountService
```

Content-Type: application/json

3.36.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 64 Enum Properties for LocalAccountAuth

Name	Description
Enabled	The service authenticates users based on the Account Service-defined accounts collection.
Disabled	The service never authenticates users based on the Account Service-defined accounts collection. Note: AMI redfish implementation will not support this value.
Fallback	The service authenticates users based on the Account Service-defined accounts collection only if any external account providers are currently unreachable.
LocalFirst	The service first authenticates users based on the Account Service-defined accounts collection. If authentication fails, the Service authenticates by using external account providers.

Table 65 SearchSettings Properties

Name	Type	Read Only	Description
BaseDistinguishedNames	Array	False	The value of this property shall be a collection of base distinguished names to use when searching the LDAP service. Note: If the user gives multiple value in the patch request, only the first value of the array will be set in BMC, as BMC currently supports only one BaseDistinguishedName
GroupNameAttribute	String	False	The value of this property shall be the attribute name that contains the name of the Group.
GroupsAttribute	String	False	The value of this property shall be the attribute name that contains the Groups for a user.
UsernameAttribute	String	False	The value of this property shall be the attribute name that contains the Username.

Table 66 Account Service Property

Property Name	Type	Read Only	Description
---------------	------	-----------	-------------



@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to How to Add OEM extensions document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Status	Object	True	Refer Section 3.3 for Resource.Oem.
ServiceEnabled	Boolean	False	This indicates whether this service is enabled. Default it will be null value
AuthFailureLoggingThreshold	Number	False	This is the number of authorization failures that need to occur before the failure attempt is logged to the manager log. This represents a modulo function value, thus the failure shall be logged every nth occurrence where n represents the value of this property. Minimum Value : 0. Note: Maximum value allowed is 50, the default being 3.
MinPasswordLength(C)	Number	True	This property shall reference the minimum password length that the implementation will allow a password to be set to. Minimum Value : 0. Note: Minimum value by default is 8. As it is a configurable property, it can be configured at buildtime in RCMD file, instructions being given in “How to Add OEM extensions” document, section 2.11 AccountService.
MaxPasswordLength(C)	Number	True	This property shall reference the maximum password length that the implementation will allow a password to be set to. Minimum Value : 0. Note: Maximum value by default is 20. As it is a configurable property, it can be configured at buildtime in RCMD file ,

			instructions being given in “How to Add OEM extensions” document, section 2.11 AccountService.
AccountLock outThreshold (C)	Number	False	<p>The number of failed login attempts before a user account is locked for a specified duration. (0=never locked)Minimum Value : 0. Default it will be null value</p> <p>Note:</p> <ul style="list-style-type: none"> • Maximum value allowed is 100 • Account Lockout feature is applicable only for redfish defined account not for remote accounts like LDAP, AD, RADIUS etc.
AccountLock outDuration(C)	Number	False	<p>This property shall reference the period of time in seconds that an account is locked after the number of failed login attempts reaches the threshold referenced by Account Lockout Threshold, within the window of time referenced by Account Lockout Counter Reset After. The value shall be greater than or equal to the value of Account Lockout Reset After. If set to 0, no lockout shall occur. Minimum Value : 0. Default it will be null value</p> <p>Note:</p> <ul style="list-style-type: none"> • Maximum value allowed is 10000 • Account Lockout feature is applicable only for redfish defined account not for remote accounts like LDAP, AD, RADIUS etc.
AccountLock outCounterR esetAfter(C)	Number	False	<p>This property shall reference the threshold of time in seconds from the last failed login attempt at which point the Account Lockout Threshold counter (that counts number of failed login attempts) is reset back to zero (at which point Account Lockout Threshold failures would be required before the account is locked). This value shall be less than or equal to Account Lockout Duration. The threshold counter also resets to zero after each successful login. Minimum Value : 0.</p> <p>Note:</p> <ul style="list-style-type: none"> • Maximum value allowed is 10000 • Account Lockout feature is applicable only for redfish defined account not for remote accounts like LDAP, AD, RADIUS etc.

Accounts	Object	True	This property shall contain the link to a collection of type ManagerAccountCollection.
Roles	Object	True	This property shall contain the link to a collection of type RoleCollection.
PrivilegeMap	Object	True	This property shall contain the link to the Priviledge Registry property.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.
LocalAccountAuth	String	False	<p>This property shall govern how the service uses the Accounts collection within this AccountService as part of authentication.</p> <p>Details about each of the modes are found in the description of the enum values.</p> <p>Refer: Enum Properties for LocalAccountAuth</p> <p>Note: The default value for this propertu shal be “LocalFirst”</p>
AccountLockoutCounterResetEnabled	Boolean	False	<p>This property shall indicate whether the threshold counter will be reset after the AccountLockoutCounterResetAfter has expired. Setting the value to false shall indicate that only a successful login will reset the threshold counter. In addition, if the user reaches the limit specified in</p> <p>AccountLockoutThreshold, the account shall be locked out indefinitely and only a reset by administrator will clear the threshold counter. If this property is absent the value shall be assumed to be true.</p> <p>Note:</p> <p>There is two conditions is used to restrict account lockout. The first is that, property AccountLockoutCounterResetEnabled cannot be patched to False when there is only enabled Administrator account, and prevent the problem that the only available Administrator account be locked.</p> <p>Also, if user delete user after patch as false(meanwhile user is more than two, not be limited by the first condition). AMI offering the constant for enable the last administrator account will never be locked.</p> <p>Please refer documentation “MegaRAC Redfish - FAQ Document” for setup config constant.</p>
LDAP	Object	False	Refer Section 3.36.1.2.1 Default it will be null value

ActiveDirectory	Object	False	Refer Section 3.36.1.2.3
-----------------	--------	-------	--

3.36.1.2.1 LDAP Properties

Table 67 LDAP Properties

Name	Type	Read Only	Description			
Authentication	Object	False	LDAP properties containing authentication details			
			Name	Type	Read Only	Description
			Authentication Type	String	True	The type of authentication used to connect to the external account provider. Note: Value is "UsernameAndPassword" for LDAP.
			UserName	String	False	The user name for the Service.
			Password	String	False	The password for this Service. A PATCH request writes the password. This property is `null` in responses.
			Oem	Object	False	OEM extension object Note: Refer section 6.10 for Oem AMI LDAP Properties.
LDAPService	Object	False	Refer Section 3.36.1.2.2			
RemoteRole Mapping	Array	False	Refer Section 3.36.1.2.4			
ServiceAddresses	Array	False	The addresses of the user account providers to which this external account provider links. The format of this field depends on the type of external account provider.			

			<p>Note: If the user gives multiple value in the patch request, only the first value of the array will be set in BMC, as BMC currently supports only one ServiceAddress</p> <p>If user provides ipv6 ServiceAddress, it is mandatory to provide port number in the end.</p> <p>Example :</p> <p>ServiceAddresses : "2001:b021:abcd::8c8:4bff:feff:f899:389"</p> <p>In the above serviceaddresses, 2001:b021:abcd::8c8:4bff:feff:f899 -> IPv6 Address 389 -> Port Number</p>
ServiceEnabled	Boolean	True	An indication of whether this service is enabled.

3.36.1.2.2 LDAPService Properties

Table 68 LDAPService Properties

Name	Type	Read Only	Description
SearchSettings	Object	False	The required settings to search an external LDAP service. Refer Table 65 SearchSettings Properties.
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extensions" document

3.36.1.2.3 Active Directory Properties

Table 69 Active Directory Properties

Name	Type	Read Only	Description
	Object	False	LDAP properties containing authentication details

Authenticatio n			Name	Type	Read Only	Description
			UserName	String	False	The user name for the Service.
			Password	String	False	The password for this Service. A PATCH or PUT request writes the password. This property is `null` in responses.
			Oem	Objec t	False	OEM extension object Note: Refer section 6.11 for Oem AMI Active Directory Properties.

3.36.1.2.4 RoleMapping Properties

Table 70 RoleMapping Properties

Property Name	Type	Read Only	Description			
RemoteRole Mapping	Array	False	The mapping rules to convert the external account providers account information to the local Redfish Role.			
			Name	Type	Read Only	Description
			LocalRole	String	False	The name of the local Redfish Role to which to map the remote user or group.
			RemoteGroup	String	False	The name of the remote group, or the remote role in the case of a Redfish Service, that maps to the local Redfish Role to which this entity links.
			RemoteUser	String	False	The name of the remote user that maps to the local

						Redfish Role to which this entity links.
			Oem	Object	False	OEM extension object Note: Refer section 6.11 for Oem AMI Active Directory Properties.

3.36.2 PATCH

3.36.2.1 Request

PATCH `https://{ip}/redfish/v1/AccountService`

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 66 Account Service Property for which ReadOnly is False that can be sent as Request body in json format.

Example Request Body for Editing AccountService:

```
{
  "AccountLockoutCounterResetAfter": 853,
  "AccountLockoutDuration": 853,
  "AccountLockoutThreshold": 100,
  "AuthFailureLoggingThreshold": 3,
  "ServiceEnabled": true,
}
```

3.36.2.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.36.3 PATCH LDAP & LDAP Service

3.36.3.1 Request

`https://{ip}/redfish/v1/AccountService`

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 66 Account Service Property for which ReadOnly is False that can be sent as Request body in json format.

Note: RemoteRoleMapping property can be patched separately and does not require Authentication.

Example Request Body for Editing AccountService:

```
{
  "LDAP": {
    "Authentication":
    {
      "Username": "cn=admin,
      dc=testldap,
      dc=com",
      "Password": "ami"
    },
    "RemoteRoleMapping":
    [
      {
        "LocalRole": "Administrator",
        "RemoteGroup": "group1",
        "RemoteUser": "dc=coretesting,dc=com"
      },
      {
        "LocalRole": "User", "RemoteGroup": "group2",
        "RemoteUser": "dc=coretesting,dc=com"
      },
      {
        "LocalRole": "operator", "RemoteGroup": "group3", "RemoteUser":
        "dc=coretesting,dc=com"
      }
    ]
  }
}
```

```

    ],
    "LDAPService":
    {
        "SearchSettings":
        {
            "BaseDistinguishedNames":
            [
                "dc=testldap,dc=com"
            ],
            "GroupsAttribute": "cn"
        }
    },
    "ServiceAddresses":
    [
        "10.0.125.48:389"
    ],
    "ServiceEnabled": true
    }
}

```

3.36.3.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.36.4 PATCH LDAP RemoteRoleMapping

This operation is used to configure LDAP RemoteRoleMapping.

User can able to create /modify /delete the RemoteRoleMapping of LDAP using this Patch operation.

For deleting a RemoteRoleMapping property, user should give the remaining RemoteRoleMapping property in the request body of PATCH operation

Note : Maximum allowed LDAP Role is five. Appropriate error will be thrown when user tries to patch more than five RemoteRoleMapping properties. Duplicate "RemoteGroup" name is not allowed while patching.

3.36.4.1 PATCH Request

https://{{ip}}/redfish/v1/AccountService

Content-Type: application/json

Sample Request Body for Creating RemoteRoleMapping:

Below example is to create four RemoteGroups "group1", "group2", "group3" and "group4

```
{
  "LDAP":
  {
    "RemoteRoleMapping":
    [
      {
        "LocalRole": "Administrator",
        "RemoteGroup": "group1",
        "RemoteUser": "dc=coretesting,
dc=com"
      },
      {
        "LocalRole": "User",
        "RemoteGroup": "group2",
        "RemoteUser": "dc=coretesting,
dc=com"
      },
      {
        "LocalRole": "Administrator",
        "RemoteGroup": "group3",
        "RemoteUser": "dc=coretesting,
```

```

        dc=com"
    },
    {
        "LocalRole": "Operator",
        "RemoteGroup": "group4",
        "RemoteUser": "dc=coretesting,
        dc=com"
    }
]
}
}
}

```

Sample Request Body to Modify/Delete RemoteRoleMapping:

Below example is to modify the LocalRole of group2 as “Administrator” and to Delete the group3 Role of LDAP

```

{
  "LDAP":
  {
    "RemoteRoleMapping":
    [
      {
        "LocalRole": "Administrator",
        "RemoteGroup": "group1",
        "RemoteUser":
        "dc=coretesting,dc=com"
      },
      {
        "LocalRole": "Administrator",
        "RemoteGroup": "group2",
        "RemoteUser":

```

```

        "dc=coretesting,dc=com"
      },
      {
        "LocalRole": "Operator",
        "RemoteGroup": "group4",
        "RemoteUser":
          "dc=coretesting,dc=com"
      }
    ]
  }
}

```

3.36.4.2 Response

The response status is success with status code as 204 and no body.

3.36.5 PATCH Active Directory

3.36.5.1 Request

https://{{ip}}/redfish/v1/AccountService

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 66 Account Service Property for which ReadOnly is False that can be sent as Request body in json format.

Note: RemoteRoleMapping property can be patched separately and does not require Authentication.

Example Request Body for Editing AccountService:

```

{
  "ActiveDirectory":
  {
    "Authentication":
    {

```

```

    "Username": "AD1",
    "Password": "AD@123",
    "Oem":
    {
        "Ami":
        {
            "DomainName": "abc123.com",
            "DomainControllerServerAddr1" : "10.0.1.23",
            "DomainControllerServerAddr1" : "",
            "DomainControllerServerAddr1" : ""
        }
    }
},
"ServiceEnabled":false
}
}

```

3.36.5.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.36.6 PATCH Active Directory RemoteRoleMapping

This operation is used to configure Active Directory RemoteRoleMapping.

User can able to create /modify/delete the RemoteRoleMapping of Active Directory using this Patch operation.

For deleting a RemoteRoleMapping property, user should give the remaining RemoteRoleMapping property in the request body of PATCH operation

Note : Maximum allowed Active Directory Role is five. Appropriate error will be thrown when user tries to patch more than five RemoteRoleMapping properties. Duplicate "RemoteGroup" name is not allowed while patching

3.36.6.1 PATCH Request

https://{{ip}}/redfish/v1/AccountService

Content-Type: application/json

Sample Request Body for Creating RemoteRoleMapping:

Below example is to create a RemoteGroup.

```

{
  "ActiveDirectory": {
    "RemoteRoleMapping": [
      {
        "LocalRole": "Administrator",
        "RemoteGroup": "redfish4",
        "RemoteUser": "Active2",
        "Oem": {
          "Ami": {
            "GroupID": 2,
            "KVMAccess": "Enable",
            "VMediaAccess": "Enable"
          }
        }
      }
    ]
  }
}

```

Sample Request Body to Modify RemoteRoleMapping:

Below example is to modify the KVMAccess of groupid 2 as "Disable"

```

{
  "ActiveDirectory":

```



```
{
  "RemoteRoleMapping":
  [
    {
      "LocalRole": "Administrator",
      "RemoteGroup": "redfish4",
      "RemoteUser": "Active2",
      "Oem":
      {
        "Ami":
        {
          "GroupID":2,
          "KVMAccess": "Disable",
          "VMediaAccess": "Enable"
        }
      }
    }
  ]
}
```

3.36.6.2 Response

The response status is success with status code as 204 and no body.

3.37 ManagerAccountCollection

It is a collection of resources that represents the user accounts

3.37.1 GET

3.37.1.1 Request

https://{ip}/redfish/v1/AccountService/Accounts

Content-Type: application/json

3.37.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.37.2 POST [Creating new Account]

- Make sure ServiceEnabled property in AccountService is true for creating an account.
- If ServiceEnabled property in AccountService is false please use PATCH on AccountService to change ServiceEnabled to true.
- The maximum limit for accounts is 14.(If disabled the Unified User Account Feature, the maximum limit for accounts would be 20.)

While creating a new redfish account using post operation, user can explicitly set the “PasswordChangeRequired” attribute to “true” or “false” in the post body. If set to “true”, then the password for this account must be changed before further access is allowed. If set to false not need to reset password for allowing access. If “PasswordChangeRequired” is not given in the post body then by default it is considered as “true”.

Note: PasswordChangeRequired validation is applicable only when request comes through Redfish uri and it will not ask to change password when logged through BMC Web UI using Redfish account (if Redfish accounts and IPMI accounts synchronization enabled)

- UserName and Password have to follow the rules:
- UserName only allows special characters '-'(hyphen), '_'(underscore), '@'(at sign) in UserName.
- UserName must be a string of 1 to 16 alpha-numeric characters.
- UserName must start with an alphabetical character.
- Password must be a string of 8 to 20 characters.

Note: The rules of “UserName” and “Password” should follow the rules of IPMI “Name” and “Password” in order to synchronize Redfish accounts and IPMI accounts.

3.37.2.1 Request

POST https://{ip}/redfish/v1/AccountService/Accounts

Content-Type: application/json

Example POST Request:

```

{
  "Name": "Test User Account",
  "Description": "Test User Account",
  "Enabled": true,
  "Password": "superuser",
  "UserName": "user_account",
  "RoleId": "Operator",
  "Locked": false
}

```

3.37.2.2 Response

The response status is 201 and the response body is a GET Response with the properties of the newly created Account. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.38 Manager Account

This resource shall be used to represent resources that represent the user accounts for the manager

Note:

- The maximum limit for accounts is 14. (If disabled the Unified User Account Feature, the maximum limit for accouts would be 20.)
- As per HI specification default accounts are HostAutoFW, HostAutoOS. HostAutoFW is used by BIOS to communicate and HostAutoOS is used by OS to communicate with redfish. BIOS will call BMC to create HostAutoOS at end of boot process and save in EFI Variable. This user will be deleted in next boot by Redfish and new password will be generated for HostAutoOS.
- HostAutoFW, HostAutoOS can't be deleted or modified.
- The ID number for newly created redfish user will start from 5, if there is only one fixed IPMI user. Suppose if there many IPMI fixed users then the ID number generated vary accordingly. ID number 1 to 3 ID are reserved. 1 is for default "Administrator" Account. ID numbers 2 is for HostAutoFW, ID number 3 is for HostAutoOS and 4 is for default admin IPMI fixed user.

- Once maximum account, 20 reached, on deleting and creating new redfish account ID number will start from 25.

3.38.1 GET

3.38.1.1 Request

https://{{ip}}/redfish/v1/AccountService/Accounts/{{account_instance}}

Content-Type: application/json

3.38.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 71 Manager Account Property

Property Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Password(C)	String	False	The value of this property shall be the password for this account. Note: Should not be displayed in the response.

UserName(C)	String	False	The value of this property shall be the user name for this account.
RoleId	String	False	The value of this property shall be the ID of the Role resource that configured for this account.
Locked	Boolean	False	<p>This property (when set to true) shall indicate that the account service has automatically locked the account due to the property accountLockoutThreshold having been exceeded.</p> <p>If Locked is set to true by account service, the account is locked and the user shall not be able to login redfish unless the property is unlocked by administrator.</p> <p>If set to false, the account will not be locked. A user admin shall be able to write a false to the property to clear the lockout condition, prior to the lockout duration period.</p> <p>Note: By default, the account service will set the value of Locked to false. (The account shall not be locked and the failed attempt should not exceed the accountLockedThreshold). Only the Administrator will be able to unlock the locked account in case it is set to true automatically in case of failed login attempts but setting the account as locked account (i.e value to true) by an Administrator is an invalid operation.</p>
Enabled	Boolean	False	This property shall enable (if set to true) or disable (if set to false) the account for future logins. The value of Enable overrides the locked property.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.
PasswordChangeRequired	Boolean	False	<p>Indicates that the password for this account must be changed.</p> <p>The service requires the password to be changed before access is allowed.</p> <p>The value of this property shall be true if the password for this account must be changed before further access is allowed. Access to the service may be denied by the implementation if the password has not been changed. A ManagerAccount created with an initial PasswordChangeRequired value of true may be used to force a password change before first access using the account.</p> <p>When the 'Password' property for this account is updated, the service shall set the value to false.</p>

			PasswordChangeRequired attribute value for default administrator account will be based on the PRJ option to disable the requirement of changing password in the first time login.			
Links	Object		The links object contains the links to other resources that are related to this resource.			
			Name	Type	Read Only	Description
			Role	Object	True	A reference to the Role object defining Privileges for this account--returned when the resource is read. The ID of the role is the same as property RoleId.

3.38.2 PATCH

“UserName” and “Password” have to follow the rules:

- “UserName” only allows special characters ‘-’(hyphen), ‘_’(underscore), ‘@’(at sign) in UserName.
- “UserName” must be a string of 1 to 16 alpha-numeric characters.
- “UserName” must start with an alphabetical character.
- “Password” must be a string of 8 to 20 characters.

Note: The rules of “UserName” and “Password” should follow the rules of IPMI “Name” and “Password” in order to synchronize Redfish accounts and IPMI accounts.

3.38.2.1 Request

PATCH `https://{{ip}}/redfish/v1/AccountService/Accounts/{{account_instance}}`

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 71 Manager Account Property for which ReadOnly is False that can be sent as Request body in json format.

Note:

HostAutoFW, HostAutoOS can't be deleted or modified.



Example Request Body for Editing an Account:

```
{
  "Enabled": true,
  "Password": "superuser",
  "UserName": "user_account",
  "RoleId": "ReadOnly",
  "Locked": false
}
```

3.38.2.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.38.3 DELETE

3.38.3.1 Request

DELETE `https://{{ip}}/redfish/v1/AccountService/Accounts/{{account_instance}}`

Content-Type: application/json

Note:

HostAutoFW, HostAutoOS can't be deleted or modified.

3.38.3.2 Response

The response status is 204 and no response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.39 Role Collection

It displays a collection of ID's subscribed to the roles in Redfish.

3.39.1 GET

3.39.1.1 Request

`https://{{ip}}/redfish/v1/AccountService/Roles`

Content-Type: application/json

3.39.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.39.2 POST [Creating new Custom Role]

3.39.2.1 Request

POST `https://{ip}/redfish/v1/AccountService/Roles`

Content-Type: application/json

Request Body

Creation of a custom Role requires that the RoleId and Name properties be in the request body. In addition to these properties, either AssignedPrivileges, OemPrivileges, or both AssignedPrivileges and OemPrivileges must be in the request body.

Example POST Request:

```
{
  "AssignedPrivileges":
  [
    "ConfigureUsers",
    "ConfigureManager",
    "ConfigureSelf",
    "Login",
    "ConfigureComponents"
  ],
  "Description": "TestRole User Role",
  "Id": "TestRole",
  "RoleId": "TestRole",
  "Name": "TestRole Role",
  "OemPrivileges":
  [
    "OemPowerControl",
```



```

        "OemClearLog"
    ]
}
    
```

3.39.2.2 Response

The response status is 201 and the response body is a GET Response with the properties of the newly created Account. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.40 Role

This resource shall be used to represent resources that represent the user role for the user account

3.40.1 GET

3.40.1.1 Request

https://{{ip}}/redfish/v1/AccountService/Roles/{{role_instance}}

Content-Type: application/json

3.40.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 72 Role Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 .

			Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document	
Id(M)	String	True	Resource Identifier	
Name(M)	String	True	Name of the Resource	
Description	String	True	Provides description of the resource. Refer Section 3.3	
IsPredefined	Boolean	True	This property is used to indicate if the Role is one of the Redfish Predefined Roles vs a Custom role.	
AssignedPrivileges	Array	False	The value of this property shall be the redfish privileges that the role includes. For pre-defined roles, this property shall be readOnly. For custom roles some implementations may not allow writing this property. Refer Appendix: Section 13.1 for the HTTP methods for URI support and the Privilege enforced for those actions.	
			Enum	Description
			Login	Able to log into the service and read resources
			ConfigureManager	Able to configure Manager resources
			ConfigureUsers	Able to configure Users and their Accounts
			ConfigureSelf	Able to change the password for the current user Account
			ConfigureComponents	Able to configure components managed by this service.
OemPrivileges	Array	False	The value of this property shall be the OEM privileges that this role includes. For pre-defined roles, this property shall be readOnly. For custom roles some implementations may not allow writing this property.	
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.	
RoleId	String	True	This property shall contain the string name of the Role. This property shall contain the same value as the Id property.	

--	--	--	--

3.40.2 PATCH

3.40.2.1 Request

PATCH `https://{{ip}}/redfish/v1/AccountService/Roles/{{role_instance}}`

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 72 Role Properties for which ReadOnly is False that can be sent as Request body in json format.

Example Request Body for Editing an Account:

```
{
  "AssignedPrivileges":
  [
    "ConfigureComponents",
    "Login",
    "ConfigureSelf"
  ]
}
```

3.40.2.2 Response

The response status is success with status code as 200 and the updated Role. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note: PATCH is supported for User defined Roles and is not supported for Predefined Roles. Error response with 405 Method Not allowed is displayed if request body content type is chosen as application/json else 415 Unsupported Media Type would be displayed.

3.40.3 DELETE

Note: DELETE is not supported for Predefined Roles.

3.40.3.1 Request

DELETE https://{ip}/redfish/v1/AccountService/Roles/{role_instance}

Content-Type: application/json

3.40.3.2 Response

The response status is 204 and no response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.41 Event Service

The Event Service resource contains properties for managing event subscriptions and generates the events sent to subscribers. The resource has links to the actual collection of subscriptions (called Event Destinations).

3.41.1 GET

3.41.1.1 Request

https://{ip}/redfish/v1/EventService

Content-Type: application/json

3.41.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 73 Event Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 .

			Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document	
Id(M)	String	True	Resource Identifier	
Name(M)	String	True	Name of the Resource	
Description	String	True	Provides description of the resource. Refer Section 3.3	
ServiceEnabled(C)	Boolean	False	This indicates whether this service is enabled. Default it will be null value	
DeliveryRetryAttempts(C)	Number	False	The number of retries attempted for any given event to the subscription destination before the subscription is terminated. Default Value for “DeliveryRetryAttempts” is 3. However, the user can alter the values for “DeliveryRetryAttempts” attribute, the value which should be within the range 1-10.	
DeliveryRetryIntervalSeconds(C)	Number	False	The interval in seconds between the retry attempts for any given event to the subscription destination. Default Value for “DeliveryRetryIntervalSeconds” is 60. However, the user can alter the values for “DeliveryRetryIntervalSeconds” attribute, the value which should be within the range 30-300.	
EventFormatTypes	Array	True	The types of the message that this service can sent to the event destination.	
			Enum	Description
			MetricReport	The Subscription destination will receive JSON bodies as MetricReport format only when the TelemetryService has generated a new Metric Report or updated an existing Metric Report.
			Event	The Subscription destination will receive JSON bodies as Event format for all other types of Events.
RegistryPrefixes	Array	True	Prefixes of Message Registries that shall be allowed for an Event Subscription. Note: Supported RegistryPrefixes are:-["EventLog", "SyncAgent", "Security", "IPMI", "HttpStatus", "Base"]	

ResourceTypes	Array	True	ResourceTypes values that shall be allowed for an Event Subscription. Note: Supported ResourceTypes are:-["Systems", "Chassis", "AccountService", "TelemetryService", "Managers", "EventService"]	
SubordinateResourcesSupported	Boolean	True	Indicated Support the SubordinateResource property on Event Subscription. Note: Default value is false.	
Actions	Object	True	The Actions object contains the available custom actions on this resource like SubmitTestEvent or any Oem Action.	
Status	Object	True	Refer Section 3.3 for Resource.Oem.	
Subscriptions (N)	Object	True	This is a reference to a collection of Event Destination resources. The value of this property shall contain the link to a collection of type EventDestinationCollection.	
ServerSentEventUri	String	True	Indicates the link to a URI for receiving Server-Sent Event representation for the events.	
SSEFilterPropertiesSupported	Object	True	Set of properties that are supported in the \$filter query parameter for the ServerSentEventUri.	
			SSEFilterProperties	Supported
			EventFormatType	true
			MessageId	true
			MetricReportDefinition	false
			OriginResource	true
			RegistryPrefix	true
			ResourceType	true
			SubordinateResources	false

3.41.2 PATCH

3.41.2.1 Request

PATCH <https://{{ip}}/redfish/v1/EventService>

Content-Type: application/json



Request Body

Please refer to the properties that are patchable in Table 73 Event Service Properties for which ReadOnly is False that can be sent as Request body in json format.

Example Request Body for Enabling or Disabling EventService :-

```
{  
  "ServiceEnabled": true,  
}
```

3.41.2.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.41.3 POST

3.41.3.1 SubmitTestEvent

3.41.3.1.1 Request

POST `https://{ip}/redfish/v1/EventService/Actions/EventService.SubmitTestEvent`

Content-Type: application/json

EventService.SubmitTestEvent can test using below Registries MessageId,

- Base
- Security
- EventLog
- IPMI
- HttpStatus
- SyncAgent

Required Parameter:

- MessageId

MessageId is a required parameter and it should be present during SubmitTestEvent Action, remaining parameters i.e. EventTimestamp, EventId, OriginOfCondition, MessageArgs and Severity are optional.

MessageId Format : "RegistryName.MajorVersion.MinorVersion.MessageKey"

User needs to specify the MessageId, MessageArgs and Severity in the POST call corresponding to the available MessageId, MessageArgs and Severity in the Registries.

As per Schema request EventId property will be ignored and replace it with its own. EventId property value will be auto generated Event Id. (i.e) "SubmitTestEvent_" followed by Timestamp.

Example: SubmitTestEvent_1585051544

User can get the available MessageId, MessageArgs and Severity in the Registries from the following URI,

https://{{ip}}/redfish/v1/Registries/{{Registry_instance.json}}

Examples:

1. Base:

<https://{{ip}}/redfish/v1/Registries/Base.1.5.0.json>

MessageId : Base.1.5.PropertyValueNotInList

MessageArgs : ["Lit","IndicatorLED"]

Severity : "Warning"

POST Request Body :

```
{
  "EventTimestamp":"2019-09-20T23:04:09+02:00",
  "EventId":"1531584914",
  "OriginOfCondition":"/redfish/v1/Chassis/Self",
  "MessageId":"Base.1.5.PropertyValueNotInList",
  "MessageArgs":["Lit","IndicatorLED"],
  "Severity":"Warning"
}
```

2. Security:

<https://{{ip}}/redfish/v1/Registries/Security.1.0.0.json>

MessageId : Security.1.0.AccessDenied

MessageArgs : ["Test"]

Severity : "Critical"

POST Request Body :

```
{  
  "EventTimestamp":"2019-09-20T23:04:09+02:00",  
  "EventId":"1531584914",  
  "OriginOfCondition":"/redfish/v1/Chassis/Self",  
  "MessageId":"Security.1.0.AccessDenied",  
  "MessageArgs":["Test"],  
  "Severity":"Critical"  
}
```

3. EventLog:

<https://{ip}/redfish/v1/Registries/EventLog.1.0.0.json>

MessageId : EventLog.1.0.ResourceAdded

POST Request Body :

```
{  
  "MessageId":"EventLog.1.0.ResourceAdded"  
}
```

4. IPMI:

<https://{ip}/redfish/v1/Registries/IPMI.1.0.0.json>

MessageId : IPMI.1.0.CommandSpecific

POST Request Body :

```
{  
  "MessageId":"IPMI.1.0.CommandSpecific"  
}
```

5. HttpStatus:

<https://{ip}/redfish/v1/Registries/HttpStatus.1.0.0.json>

MessageId : HttpStatus.1.0.MethodNotAllowed

POST Request Body :

```
{  
  "MessageId":"HttpStatus.1.0.MethodNotAllowed"  
}
```

6. SyncAgent:

https://{ip}/redfish/v1/Registries/SyncAgent.1.0.0.json

MessageId : SyncAgent.1.0.AddressOrigin

POST Request Body :

```
{
  "MessageId":"SyncAgent.1.0.AddressOrigin"
}
```

3.41.3.1.2 Response

The response status is 204 with no response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.41.4 ServerSentEvents

Server-Sent Events (SSE), as defined by the Web Hypertext Application Technology Working Group, allows for a client to open a connection with a web service, and the web service can continuously push data to the client as needed.

Successful Resource responses for SSE shall:

- Return the HTTP 200 status code.
- Have a Content-Type header set as “text/event-stream” or “text/event-stream;charset=utf-8”

Unsuccessful Resource responses for SSE shall:

- Return an HTTP status code of 400 or greater.
- Have a Content-Type header set as “application/json” or “application/json;charset=utf-8”
- Contain a JSON object in the response body, as described in Error responses, which details the error or errors.

3.41.4.1 ServerSentEvents Listener

ServerSent Event Listener will be listening on port 9090 and is started along with redfish server. This Listener will listen for GET requests from client on the ServerSentEventUri.

ServerSentEventUri is a property under EventService Resource that contains the URI to which client should give a GET request to indicate that the server should send the events in the form of SSE by opening a connection with the client and to use this

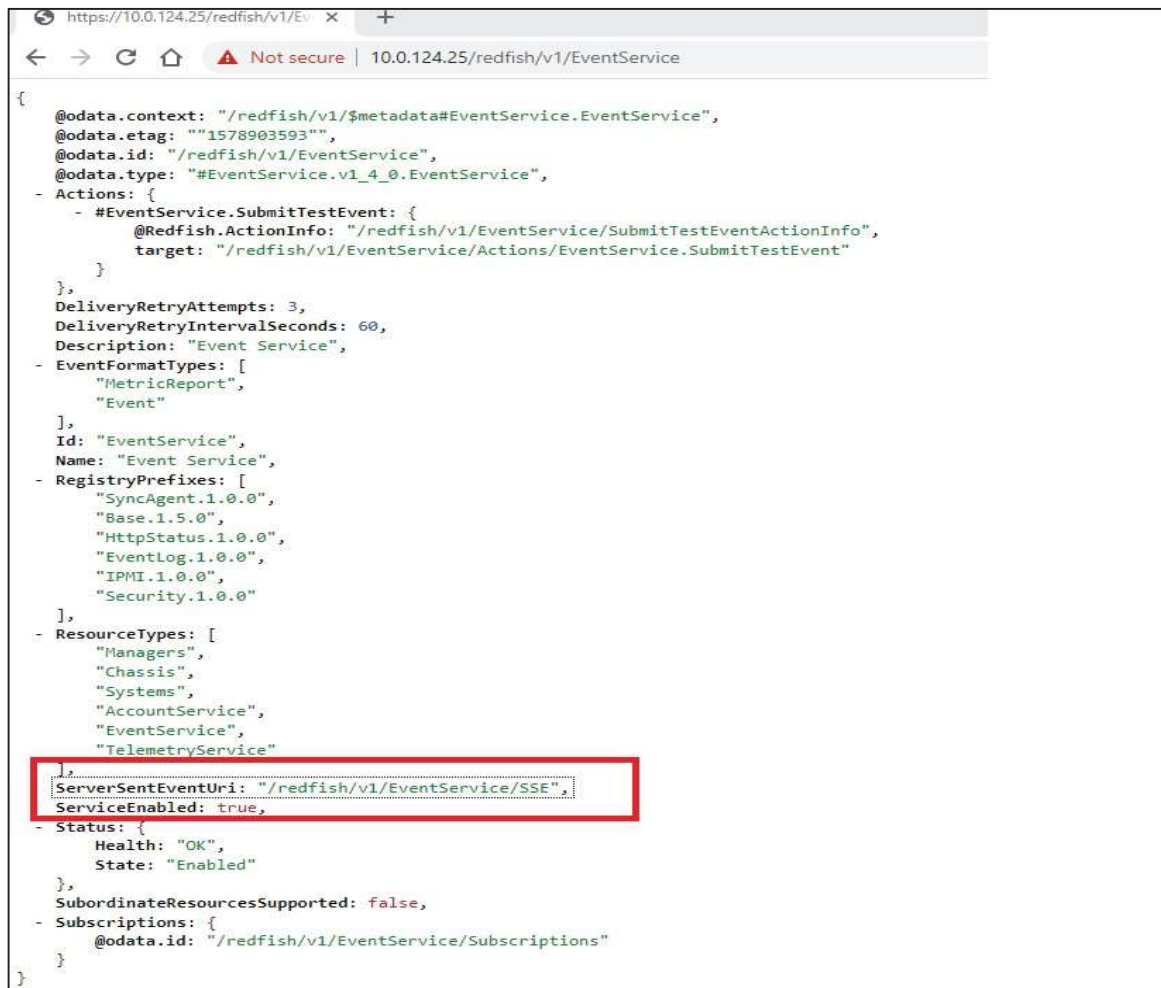
connection to end subsequent events as a stream with “text/event-stream” Content-Type header.

3.41.4.2 Workflow of ServerSentEvents

1. User can Check for the serversent URI from the property “ServerSentEventUri” from the following URI,

Get Request :

<https://{{ip}}/redfish/v1/EventService>



```

{
  @odata.context: "/redfish/v1/$metadata#EventService.EventService",
  @odata.etag: ""1578903593"",
  @odata.id: "/redfish/v1/EventService",
  @odata.type: "#EventService.v1_4_0.EventService",
  - Actions: {
    - #EventService.SubmitTestEvent: {
      @Redfish.ActionInfo: "/redfish/v1/EventService/SubmitTestEventActionInfo",
      target: "/redfish/v1/EventService/Actions/EventService.SubmitTestEvent"
    }
  },
  DeliveryRetryAttempts: 3,
  DeliveryRetryIntervalSeconds: 60,
  Description: "Event Service",
  - EventFormatTypes: [
    "MetricReport",
    "Event"
  ],
  Id: "EventService",
  Name: "Event Service",
  - RegistryPrefixes: [
    "SyncAgent.1.0.0",
    "Base.1.5.0",
    "HttpStatus.1.0.0",
    "EventLog.1.0.0",
    "IPMI.1.0.0",
    "Security.1.0.0"
  ],
  - ResourceType: [
    "Managers",
    "Chassis",
    "Systems",
    "AccountService",
    "EventService",
    "TelemetryService"
  ],
  ServerSentEventUri: "/redfish/v1/EventService/SSE",
  ServiceEnabled: true,
  - Status: {
    Health: "OK",
    State: "Enabled"
  },
  SubordinateResourcesSupported: false,
  - Subscriptions: {
    @odata.id: "/redfish/v1/EventService/Subscriptions"
  }
}

```

2. User Issues a GET Request to the ServerSentEventUri.

Get Request :

<https://{{ip}}/redfish/v1/EventService/SSE>

- The above requested is redirected from lighttpd to the serversent event listener which validates the request URI along with the given filter parameters if any and creates a subscription for successful validation in the following URI,

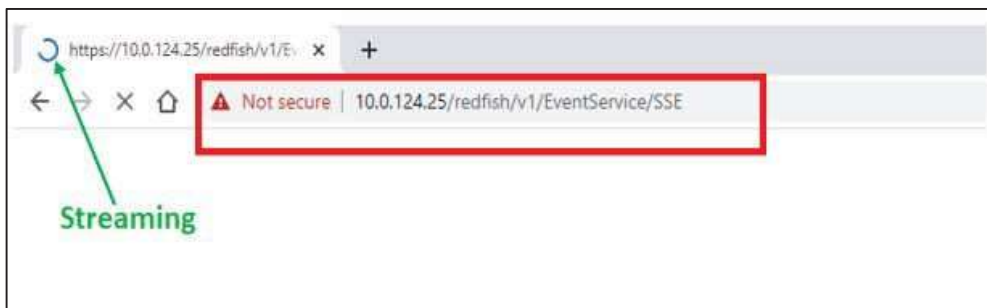
Get Request :

https://{{ip}}/redfish/v1/EventService/Subscriptions

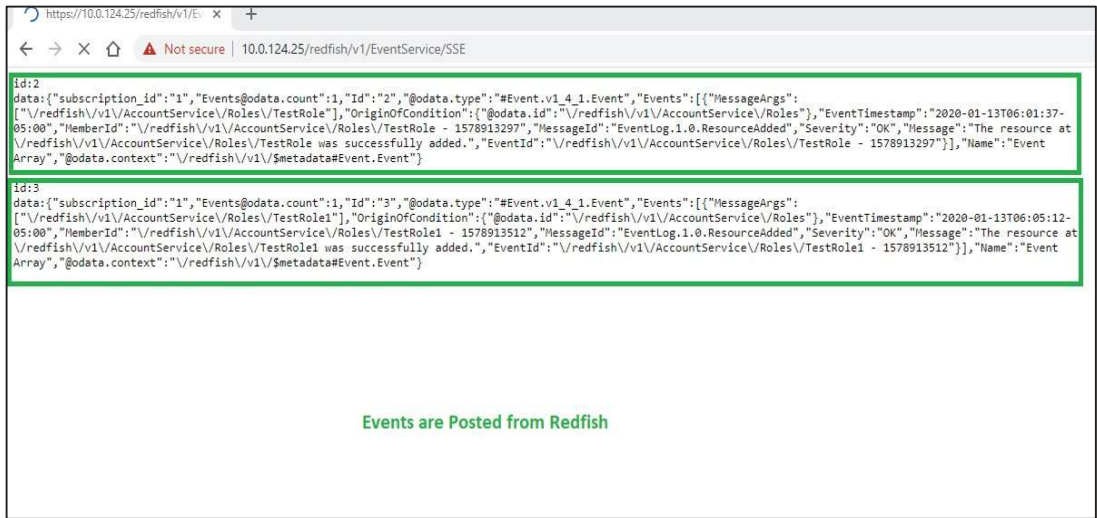


SSE Server also sends a HTTP Response with 200 Status Code along with Content-Type Header as “text/event-stream”.

- SSE client can be a curl or any browser supporting SSE as given in below link https://en.wikipedia.org/wiki/Server-sent_events
- Now SSE client is continuously listening for SSE Events Subscribed for EventFormatType value given in the filter or Event as the default EventFormatType.



- Whenever an event is triggered in Redfish, events are filtered according to the filter parameters as provided in the Event Subscription and is sent to the SSE Server. SSE Server sends the events as stream data to the SSE Event destinations.



7. Events gets filter by filter property values

SSE Supported Filter properties:

1. EventFormatType
2. MessageId
3. OriginResource
4. RegistryPrefix
5. ResourceType

SSE Not Supported Filter properties:

1. MetricReportDefinition
2. SubordinateResources

Examples:

EventFormatType

- Event:

When user creates an SSE Event Destination with EventFormatType as Event, then SSE client will get an Event in Event format.

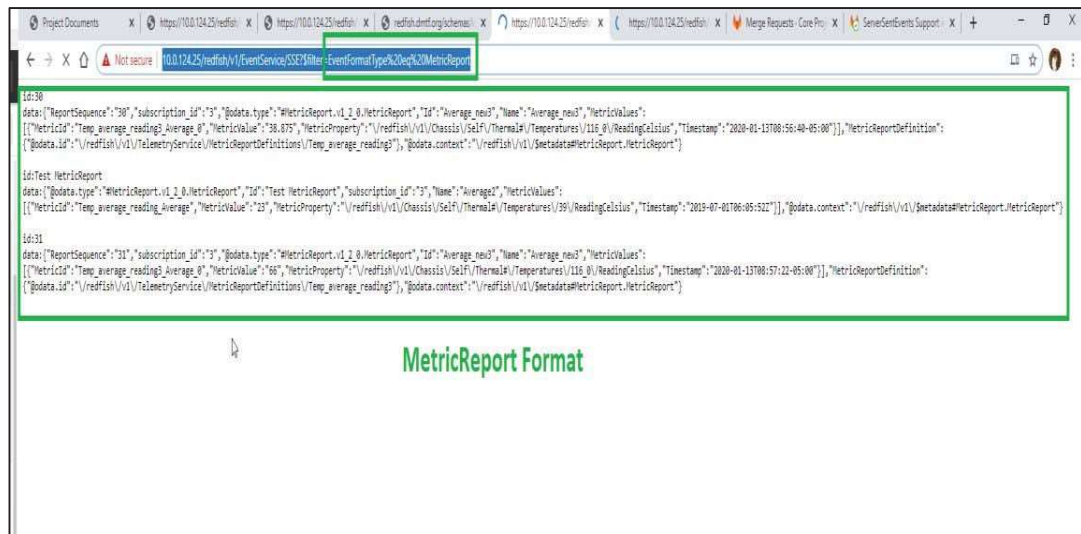
`https://{BMC_IP}/redfish/v1/EventService/SSE?$filter=EventFormatType eq Event`



- **MetricReport:**

When user creates an SSE Event Destination with EventFormatType as MetricReport, then SSE client will get an Event in MetricReport format.

https://{BMC_IP}/redfish/v1/EventService/SSE?filter=EventFormatType eq MetricReport



- **MessageId:**

When User creates an SSE Event Destination with supported MessageId in Registries https://{ip}/redfish/v1/Registries/{Registry_instance.json} then SSE client will get an event only if MessageId are matches with the generated event MessageId.

https://{BMC_IP}/redfish/v1/EventService/SSE?filter=MessageId eq EventLog.1.0.ResourceAdded or MessageId eq Base.1.5.CreateLimitReachedForResource



- OriginResource:

When User creates an SSE Event Destination with OriginResource then SSE client will get an event only if OriginResource are matches with the generated event OriginOfCondition.

`https://{BMC_IP}/redfish/v1/EventService/SSE?$filter=OriginResource eq /redfish/v1/AccountService/Accounts`



- RegistryPrefix:

When User creates an SSE Event Destination with supported RegistryPrefixes in (`https://{ip}/redfish/v1/EventService`), then SSE client will get an event only if RegistryPrefixes are matches with the generated event MessageId.

`https://{BMC_IP}/redfish/v1/EventService/SSE?$filter=RegistryPrefix eq Base or RegistryPrefix eq Security or RegistryPrefix eq EventLog`



- ResourceType:

When User creates an SSE Event Destination with supported ResourceTypes in EventService (https://{ip}/redfish/v1/EventService), then SSE client will get an event only if ResourceTypes are matches with the generated event OriginOfCondition.

https://{BMC_IP}/redfish/v1/EventService/SSE?\$filter=ResourceType eq AccountService or ResourceType eq Chassis

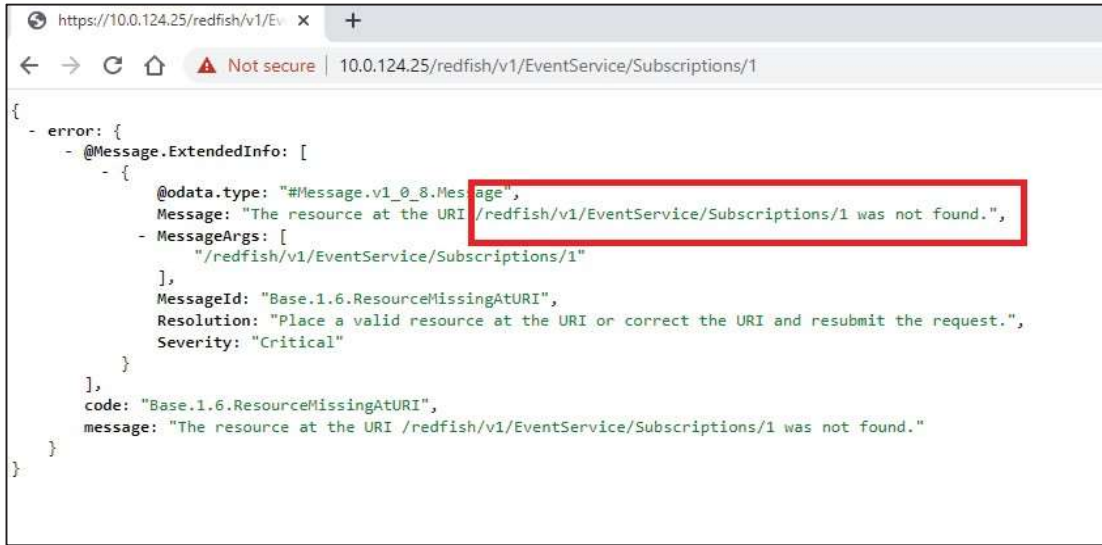


8. Whenever a SSE client closes the connection will stop streaming and the subscription related to the SSE client destination is deleted.

- Close SSE stream:



- SSE Subscription gets deleted:

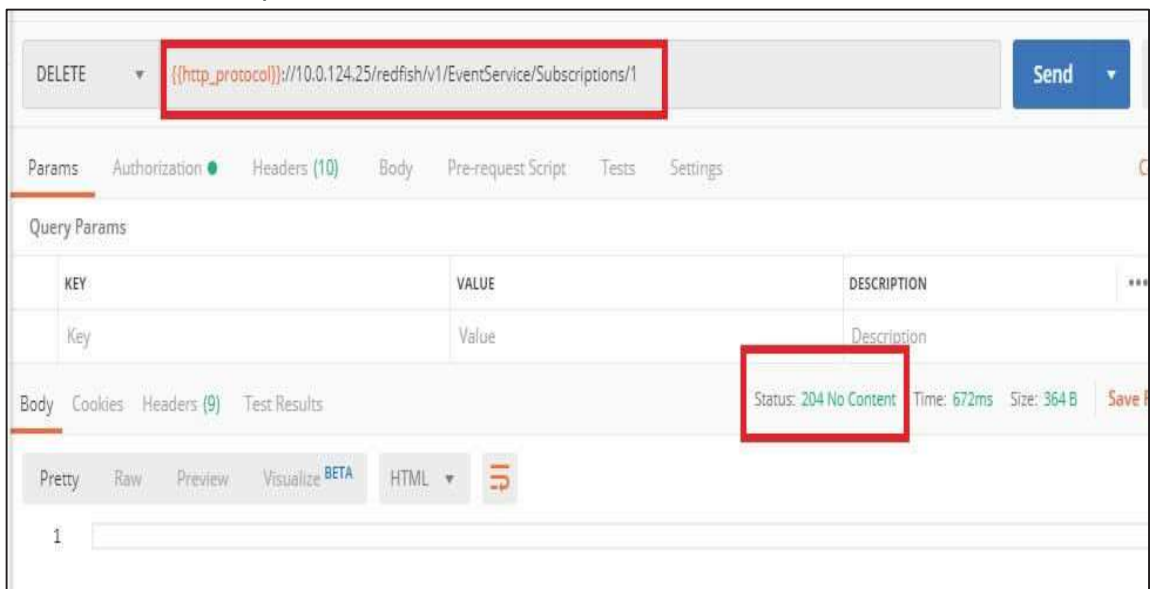


```

{
  - error: {
    - @Message.ExtendedInfo: [
      - {
        @odata.type: "#Message.v1_0_8.Message",
        Message: "The resource at the URI /redfish/v1/EventService/Subscriptions/1 was not found.",
        - MessageArgs: [
          "/redfish/v1/EventService/Subscriptions/1"
        ],
        MessageId: "Base.1.6.ResourceMissingAtURI",
        Resolution: "Place a valid resource at the URI or correct the URI and resubmit the request.",
        Severity: "Critical"
      }
    ],
    code: "Base.1.6.ResourceMissingAtURI",
    message: "The resource at the URI /redfish/v1/EventService/Subscriptions/1 was not found."
  }
}
    
```

9. Similarly whenever SSE subscription is deleted will close the respective SSE stream.

- Delete SSE Subscription:



DELETE {{http_protocol}}://10.0.124.25/redfish/v1/EventService/Subscriptions/1 Send

Params Authorization Headers (10) Body Pre-request Script Tests Settings

Query Params

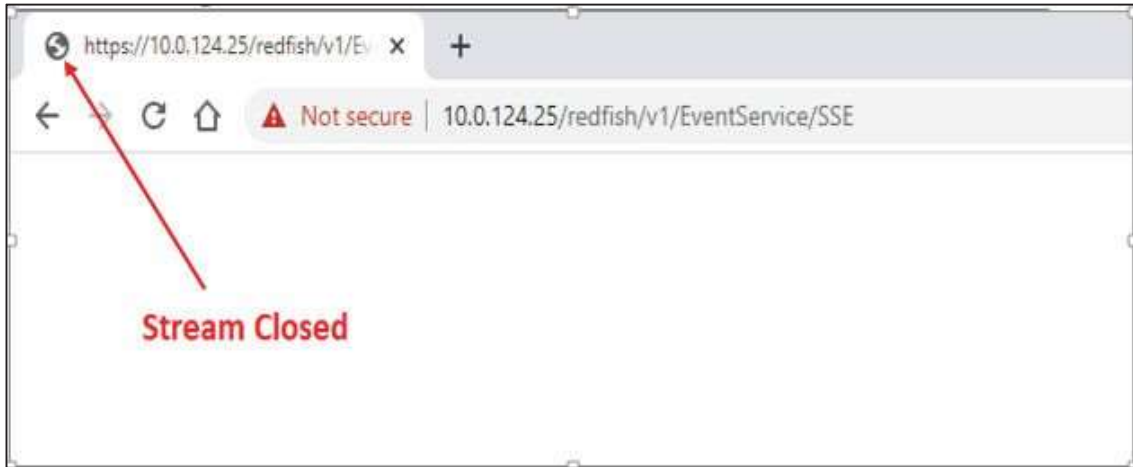
KEY	VALUE	DESCRIPTION
Key	Value	Description

Body Cookies Headers (9) Test Results

Status: 204 No Content Time: 672ms Size: 364 B Save

Pretty Raw Preview Visualize BETA HTML

- SSE Stream get closed:

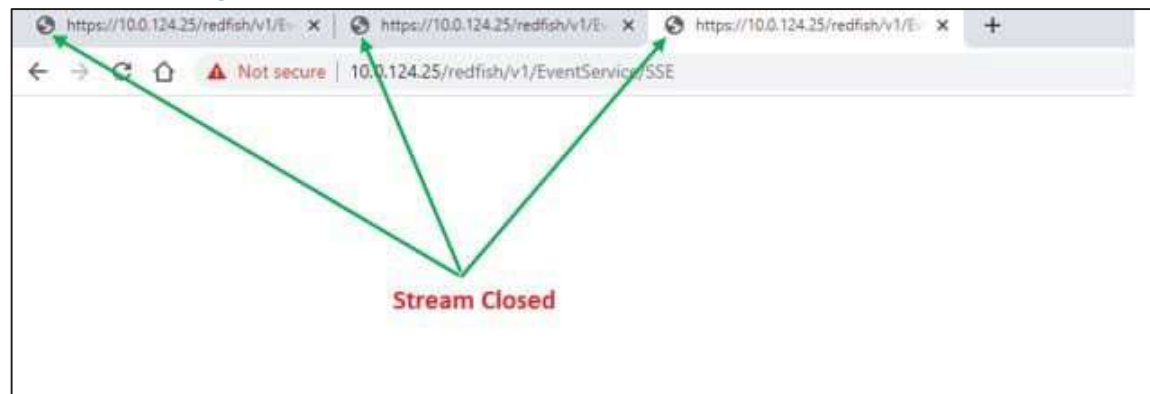


10. Whenever redfish-server stops/restart will close all connected SSE stream and all SSE related subscriptions is deleted.

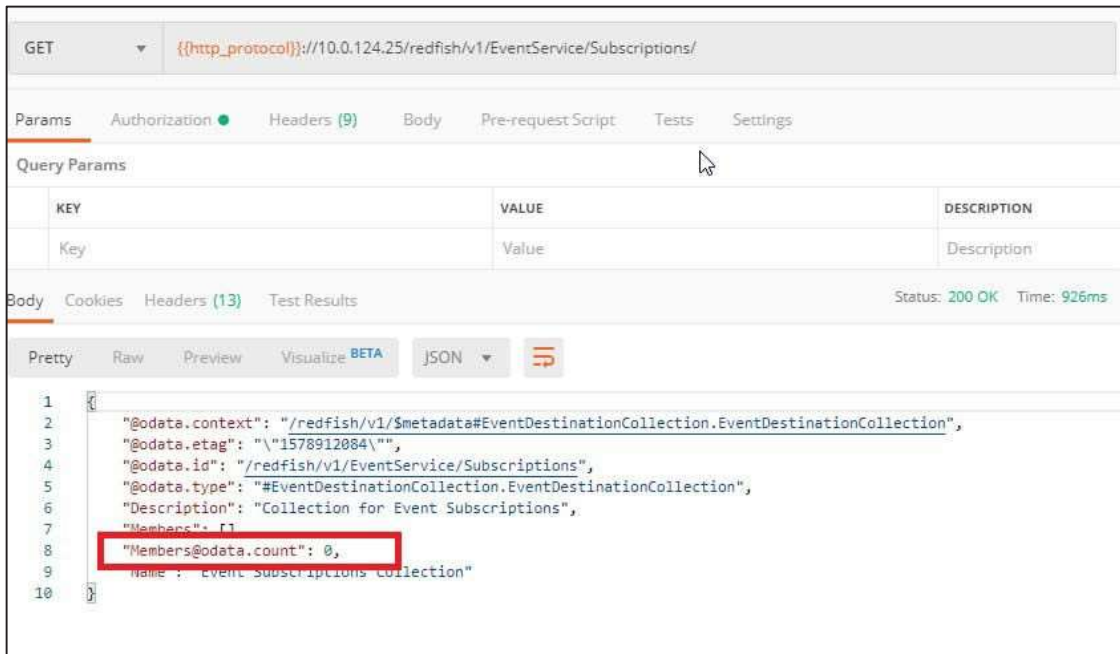
- redfish-server restart:

```
~ #  
~ # /etc/init.d/redfish-server restart  
Restarting Redfish Server  
Launching Task-Service...  
Launching Event-Service...  
~ #  
~ #
```

- All SSE stream get closed:



- All SSE Subscriptions gets deleted:



11. Max SSE connection allowed 5, more than 5 SSE connections are not allowed.



3.41.4.3 Limitations

1. Closing SSE Client Connection will have a delay of 2 minutes to get updated in the event subscription collection. (Step 8 in workflow of ServerSentEvents).
2. Last-Event-ID is not supported.

Note: At an interval of 2 minutes, SSE server will sent dummy comments to the clients to keep connection alive.

3.42 Event SubscriptionCollection

It displays a collection of ID's subscribed to this Redfish EventService and conforms to the Event Destination Collection Schema.

3.42.1 GET

3.42.1.1 Request

https://{{ip}}/redfish/v1/EventService/Subscriptions

Content-Type: application/json

3.42.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.42.2 POST

Please Refer [Section 15.2](#) for EventService Notification Examples.

Note:

The maximum limit for events subscription is 15 and it can be increased by editing the config file(redfish-lua) as per customer requirement.

Creation of Event Subscriptions will not send event to Event Destination.

3.42.2.1 Request

POST https://{{ip}}/redfish/v1/EventService/Subscriptions

Content-Type: application/json

Examples:

1. With EventFormatType, RegistryPrefixes and ResourceTypes:
User can check the list of supported EventFormatType, RegistryPrefixes and ResourceTypes values in https://{{ip}}/redfish/v1/EventService.

Request body:

```
{
  "Context": "ABCDEFGH",
  "Destination": "http://10.0.145.99:5000/event",
  "EventFormatType": "Event",
  "RegistryPrefixes":
  [
    "SyncAgent",
```

```

    "Base",
    "EventLog"
  ],
  "ResourceTypes":
  [
    "Chassis",
    "AccountService",
    "Systems",
    "EventService"
  ],
  "Protocol": "Redfish"
}

```

Response Body:

```

{
  "@odata.context": "/redfish/v1/$metadata#EventDestination.EventDestination",
  "@odata.etag": "\"1583725738\"",
  "@odata.id": "/redfish/v1/EventService/Subscriptions",
  "@odata.type": "#EventDestination.v1_6_0.EventDestination",
  "Context": "ABCDEFGH",
  "DeliveryRetryPolicy": "TerminateAfterRetries",
  "Description": "Event Subscription",
  "Destination": "http://10.0.145.99:5000/event",
  "EventFormatType": "Event",
  "Id": 1,
  "Name": "Subscription 1",
  "OriginResources@odata.count": 0,
  "Protocol": "Redfish",
  "RegistryPrefixes":
  [
    "SyncAgent",
    "EventLog",
    "Base"
  ],
  "ResourceTypes":
  [
    "EventService",
    "AccountService",
    "Chassis",
    "Systems"
  ],
}

```

```

    "Status":
    {
        "Health": "OK",
        "HealthRollup": "OK",
        "State": "Enabled"
    },
    "SubordinateResources": false
}

```

2. Without EventFormatType , RegistryPrefixes and ResourceTypes:

RegistryPrefixes, ResourceTypes values are empty or absent are accepted in POST call. In this case service shall sent events to destination with any ResourceTypes or any RegistryPrefixes.

If EventFormatType property was absent on POST call then default value will be Event.

Request Body:

- i) RegistryPrefixes & Resource Types are empty


```

      {
          "Context": "ABCDEFGH",
          "Destination": "http://10.0.145.99:5000/event",
          "RegistryPrefixes": [],
          "ResourceTypes": [],
          "Protocol": "Redfish"
      }
      
```
- ii) EventFormatType, ResgistryPrefixes & ResourceTypes are absent


```

      {
          "Context": "ABCDEFGH",
          "Destination": "http://10.0.145.99:5000/event",
          "Protocol": "Redfish"
      }
      
```

Response Body:

```

{
    "@odata.context": "/redfish/v1/$metadata#EventDestination.EventDestination",
    "@odata.etag": "\"1583726231\"",
    "@odata.id": "/redfish/v1/EventService/Subscriptions",
    "@odata.type": "#EventDestination.v1_6_0.EventDestination",
    "Context": "ABCDEFGH",

```

```

    "DeliveryRetryPolicy": "TerminateAfterRetries",
    "Description": "Event Subscription",
    "Destination": "http://10.0.145.99:5000/event",
    "EventFormatType": "Event",
    "Id": 2,
    "Name": "Subscription 2",
    "OriginResources@odata.count": 0,
    "Protocol": "Redfish",
    "Status":
    {
        "Health": "OK",
        "HealthRollup": "OK",
        "State": "Enabled"
    },
    "SubordinateResources": false
}

```

3.42.2.2 Response

The response status is 201 and the response body is a GET Response with the properties of the newly created EventDestination Entity as given below. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.43 Event Subscription

This resource shall be used to represent resources that represent the Event Subscriptions and conforms to the Event Destination Schema.

Note: A subscription instance is shown only when events are subscribed or posted using POST Action.

3.43.1 GET

3.43.1.1 Request

GET https://{{ip}}/redfish/v1/EventService/Subscriptions/{{Subscriptions_instance}}

Content-Type: application/json

3.43.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table:-

Table 74 Event Subscription Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3. Note: This property will be a part of JSON response only if an oem property is implemented according to How to Add "OEM extensions" document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Destination	String	True	This property shall contain a URI to the destination where the events will be sent.
Context	String	False	A client-supplied Description that is stored with the event destination subscription. This property shall contain a client supplied context that will remain with the connection through the connections lifetime.
Subscription Type	String	True	The value of this property shall indicate the type of subscription for events. If this property is not present, the SubscriptionType shall be assumed to be "RedfishEvent". "RedfishEvent" SubscriptionType indicates that the subscription follows the

			Redfish specification for event notifications, which is done by a service sending an HTTP POST to the subscriber's destination URI.	
Protocol	String	True	The protocol type of the event connection. This property shall contain the protocol type that the event will use for sending the event to the destination. A value of Redfish shall be used to indicate that the event type shall adhere to that defined in the Redfish specification. "enum": ["Redfish"]	
MessageIds	Array	True	A list of MessageIds that the service will only send. If this property is absent or the array is empty, then Events with any MessageId will be sent to the subscriber.	
OriginResource	Array	True	A list of resources for which the service will only send related events. If this property is absent or the array is empty, then Events originating from any resource will be sent to the subscriber.	
OriginResources@odata.count	Number	True	The number of items in a collection	
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.	
SubordinateResources	Boolean	True	This property specifying OriginResources when set to true. Note: Default value is false.	
EventFormatType	String	True	This property shall contain the types of message that will be sent to the Event destination.	
			Enum	Description
			MetricReport	The Subscription destination will receive JSON bodies as MetricReport format only when the TelemetryService has generated a new Metric Report or updated an existing Metric Report.
			Event	The Subscription destination will receive JSON bodies as Event format for all other types of Events.
RegistryPrefixes	Array	True	A list of Prefixes for the Message Registries that contain the MessageIds.	

ResourceTypes	Array	True	A list of Resource type values that corresponds to the OriginOfCondition.	
Status	Object	True	Refer Section 3.3 for Resource.Oem. Note: State will be changed to Disabled and Health and HealthRollup to Critical when the subscription get's Suspended.	
MetricReportDefinitions	Array	True	This property shall specify an array of metric report definitions that are the only allowable generators of metric reports for this subscription. Metric reports originating from metric report definitions not contained in this array shall not be sent to the subscriber. If this property is absent or the array is empty, the service shall send metric reports originating from any metric report definition to the subscriber. Note: This property will be allowed only if the EventFormatType is MetricReport. Also the Metric Report Definition must have the ReportAction as RedfishEvent.	
DeliveryRetryPolicy	String	False	This property shall indicate the subscription delivery retry policy for events where the subscription type is RedfishEvent. If this property is not present, the policy shall be assumed to be TerminateAfterRetries.	
			Enum	Description
			RetryForever	The subscription is not suspended or terminated, and attempts at delivery of future events shall continue even after the after the maximum number of retries is reached.
			SuspendRetries	The subscription is suspended after the maximum number of retries is reached.
			TerminateAfterRetries	The subscription is terminated after the maximum number of retries is reached.The subscription will get deleted after the retry attempts.

3.43.2 PATCH



3.43.2.1 Request

PATCH [https://{ip}/redfish/v1/EventService/Subscriptions/
{{Subscriptions_instance}}](https://{ip}/redfish/v1/EventService/Subscriptions/{{Subscriptions_instance}})

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Properties for which ReadOnly is False that can be sent as Request body parameters in json format.

Example Request Body:-

```
{  
  "Context": "Event_1"  
}
```

3.43.2.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.43.3 DELETE

Note:

Deletion of Event Subscriptions will not send event to Event Destination.

3.43.3.1 Request

DELETE [https://{ip}/redfish/v1/EventService/Subscriptions/
{{Subscriptions_instance}}](https://{ip}/redfish/v1/EventService/Subscriptions/{{Subscriptions_instance}})

Content-Type: application/json

3.43.3.2 Response

The response status is 204 and no response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.43.4 POST

This action shall resume a suspended event subscription, which affects the subscription status.

This action link is shown in the subscriptions instance only when the subscription gets suspended.

3.43.4.1 Request

POST `https://{{ip}}/redfish/v1/EventService/Subscriptions/{{Subscriptions_instance}}/Actions/EventDestination.ResumeSubscription`

Request Body

This action does not require any request body. Even if the request body is supplied, it will not be validated.

3.43.4.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.44 Task Service

This resource shall be used to represent a task service for a Redfish implementation. It represents the properties for the service itself and has links to the actual list of tasks.

3.44.1 GET

3.44.1.1 Request

`https://{{ip}}/redfish/v1/TaskService`

Content-Type: application/json

3.44.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 75 Task Service Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1

@odata.etag	String	True	Refer Section 3.1	
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document	
Id(M)	String	True	Resource Identifier	
Name(M) (C)	String	True	Name of the Resource	
Description (C)	String	True	Provides description of the resource. Refer Section 3.3	
CompletedTaskOverWritePolicy(C)	String	True	The value of this property shall indicate how completed tasks are handled should the task service need to track more tasks.	
			Enum	Description
			Manual	Completed tasks are not automatically overwritten.
			Oldest	Oldest completed tasks are overwritten.
DateTime	String	True	The current DateTime value for the TaskService, with offset from UTC, in Redfish Timestamp format.	
LifeCycleEventOnTaskStateChange	Boolean	True	The value of this property, if set to true, shall indicate that the service shall send a Life Cycle event to Listener Destinations registered for such events upon change of task state	
ServiceEnabled(C)	Boolean	True	This indicates whether this service is enabled.	
Status	Object	True	Refer Section 3.3 for Resource.Oem.	
Tasks	Object	True	The value of this property shall be a link to a resource of type Task Collection.	
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.	

3.45 Task Collection

It displays the collection of links to each task.

Note: If the HTTPS POST create operations or action required additional time to be completed, this will map into the async task and creating task.

The post response header "Location" will have the created task URI in the task collection for task monitor.

The following service URI will create a task to handle the job and add a member into URI /redfish/v1/TaskService/Tasks that makes user can monitor the state of the task.

1. Reset Actions:

/redfish/v1/Chassis/Self/Actions/Chassis.Reset

/redfish/v1/Managers/Self/Actions/Manager.Reset

/redfish/v1/Systems/Self/Actions/ComputerSystem.Reset

2. Logservice Actions:

/redfish/v1/Managers/Self/LogServices/SEL/Actions/LogService.ClearLog

/redfish/v1/Managers/Self/LogServices/AuditLog/Actions/LogService.ClearLog

/redfish/v1/Managers/Self/LogServices/EventLog/Actions/LogService.ClearLog

/redfish/v1/Chassis/Self/LogServices/Logs/Actions/LogService.ClearLog

/redfish/v1/Systems/Self/LogServices/BIOS/Actions/LogService.ClearLog

3. /redfish/v1/UpdateService/Actions/SimpleUpdate

4. Use subscribing service URI /redfish/v1/EventService/Subscriptions to subscribe BMC.

After subscribing, user triggers the event and Redfish send notification to event destination. Redfish send notification to destination will create the corresponding task into Task Collection.

You can use service URI /redfish/v1/EventService/Actions/EventService.SubmitTestEvent to trigger the event.

5. /redfish/v1/Managers/Self/Actions/Oem/AMIManager.RedfishDBReset

6. /redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR

7. /redfish/v1/AccountService/Accounts/Accounts_instance/Certificates/Certificates_instance/Actions/Certificate.Rekey

8. /redfish/v1/UpdateService/upload

3.45.1 GET

3.45.1.1 Request

https://{{ip}}/redfish/v1/TaskService/Tasks

Content-Type: application/jsonAccounts

3.45.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

Note : Maximum task count supported is 15

3.46 Task

Note:

1. The purpose of the Task Service daemon is to send the Event Notification to the Destination. The Task Service daemon will try for three times and if it is success, it will move on to the next Destination that had subscribed to the occurred event.
2. In case, the Event Receiver at the destination isn't up, the daemon will be unable to deliver the notification and after trying for three times, it will not delete the Event subscription.
3. Rather it will move on to the next Destination that had subscribed to the occurred event or it will wait for the next event to occur, to complete the same set of operations.
4. When the Task Service daemon is trying to deliver the Event Notification to the Destination, in case the BMC reboots, the Task Service/Event Service Daemons will exit and hence, the already running tasks will be interrupted in between.
5. When the BMC comes up again, the Task Service/Event Service Daemons will start to function again; at this time, the tasks which had stopped due to BMC reboot will be having TaskState as "New"/"Starting"/"Running".
6. These tasks which are in pending state, will be triggered again to be received by the Task Service Daemon and it will try to send the Event Notification to the Destination.
7. It will try for three times and based on success/failure, it will update the TaskState and TaskStatus attributes of the corresponding task.
8. As per the Redfish DMTF Schema, the supported enum values for TaskState are as defined below:

"New", "Starting", "Running", "Suspended", "Interrupted", "Pending", "Stopping", "Completed", "Killed", "Exception", "Service", "Cancelling", "Cancelled"

As per the current implementation in our Redfish Stack, we make use of the below mentioned enum values of TaskState :

"New", "Running", "Pending", "Completed", "Exception", "Cancelled"

However, we do provide support for all of the enum values as mentioned in the schema.

The enum values "Starting", "Suspended", "Interrupted", "Stopping", "Service", "Killed" and "Cancelling" can be used by any new feature according to their needs and will be utilised as and when found appropriate with respect to the new feature request.

3.46.1 GET

3.46.1.1 Request

https://{{ip}}/redfish/v1/TaskService/Tasks/{{task_instance}}

Content-Type: application/json

3.46.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 76 Task Property

Name	Type	Read Only	Description	
@odata.context	String	True	Refer Section 3.1	
@odata.id	String	True	Refer Section 3.1	
@odata.type	String	True	Refer Section 3.1	
@odata.etag	String	True	Refer Section 3.1	
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document	
Id(M)	String	True	Resource Identifier	
Name(M)	String	True	Name of the Resource	
Description	String	True	Provides description of the resource. Refer Section 3.3	
TaskState	String	True	The value of this property shall indicate the state of the task.	
			Enum	Description
			New	New shall be used to indicate that the task is a new task which has just been instantiated and is in the initial state and indicates it has never been started.
			Starting	Task is starting. Starting shall be used to indicate that the task is moving from the New,

				Suspended, or Service states into the Running state.
			Running	Task is running normally. Running shall be used to indicate that the Task is running.
			Suspended	Task has been suspended. Suspended shall be used to indicate that the Task is stopped (e.g., by a user), but can be restarted in a seamless manner.
			Interrupted	Task has been interrupted. Interrupted shall be used to indicate that the Task was interrupted (e.g., by a server crash) in the middle of processing, and the user should either re-run/restart the Task.
			Pending	Task is pending and has not started. Pending shall be used to indicate that the Task has been queued and will be scheduled for processing as soon as resources are available to handle the request.
			Stopping	Task is in the process of stopping. Stopping shall be used to indicate that the Task is in the process of moving to a Completed, Killed, or Exception state.
			Completed	Task has completed. Completed shall be used to indicate that the task has completed normally.
			Killed	Task was terminated. Killed shall be used to indicate that the task has been stopped by a Kill state change request (non-graceful shutdown).
			Exception	Task has stopped due to an exception condition. Exception shall be used to indicate that the Task is in an abnormal state that might be indicative of an error condition.
			Service	Task is running as a service. Service shall be used to indicate that the Task is in a state that supports problem discovery, or

			resolution, or both. This state is used when a corrective action is possible.				
			<table border="1"> <tr> <td>Cancelling</td> <td>Task is in the process of being cancelled.</td> </tr> <tr> <td>Cancelled</td> <td>Task has been cancelled by an operator or internal process. It will show reason for cancellation. For Error Responses refer Section 2.8.2 and Section 2.8.3.</td> </tr> </table>	Cancelling	Task is in the process of being cancelled.	Cancelled	Task has been cancelled by an operator or internal process. It will show reason for cancellation. For Error Responses refer Section 2.8.2 and Section 2.8.3 .
Cancelling	Task is in the process of being cancelled.						
Cancelled	Task has been cancelled by an operator or internal process. It will show reason for cancellation. For Error Responses refer Section 2.8.2 and Section 2.8.3 .						
StartTime	String	True	The date-time stamp that the task was last started. The value of this property shall indicate the time the task was started.				
EndTime	String	True	The value of this property shall indicate the time the task was completed.				
TaskStatus	String	True	The value of this property shall be the completion status of the task, as defined in the Status Section of the Redfish specification and shall not be set until the task has completed.				
Messages	Array	True	This is an array of messages associated with the task.				
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.				
HidePayload	Boolean	True	If value of this property is true will hide the contents of the Payload otherwise the Payload contents can be returned normally. Note : North Bound Support only available.				
PercentComplete	Integer	True	Completion percentage of this Task. Note : North Bound Support only available.				
Payload	Object	True	Refer Below table for Payload property details. Note : North Bound Support only available.				

Table 77 Payload Properties

Name	Type	Read Only	Description
HttpHeaders	Array	True	HTTP Headers used in the execution of this Task.
HttpOperation	String	True	HTTP Operation to execution for this Task.

JsonBody	String	True	JSON Payload used for this Task.
TargetUri	String	True	URI of the Target for this Task.

3.46.2 DELETE

3.46.2.1 Request

DELETE `https://{{ip}}/redfish/v1/TaskService/Tasks/{{task_instance}}`

Content-Type: application/json

3.46.2.2 Response

The response status is 204 and no response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.47 JSON Schema file collection

It displays the collection of links to each schema hosted locally for the OEM JSONSchemaFiles.

Note: The list will be populated and point the odata.id links to the JSONSchemas, only if any present otherwise the Members list will be empty.

3.47.1 GET

3.47.1.1 Request

`https://{{ip}}/redfish/v1/JsonSchemas`

Content-Type: application/json

3.47.1.2 Response

Please refer Section 3.5 for the JSON response properties.

3.48 JsonSchemaFile

This is the schema definition for the Schema File locator resource. This resource shall be used to represent the Schema File locator resource for a Redfish implementation.

Eg: /redfish/v1/JsonSchemas/Configurations.v1_0_0 represents the odata.id link to the Configurations Schema.

3.48.1 GET

3.48.1.1 Request

https://{ip}/redfish/v1/JsonSchemas/<json_schema_name>

Content-Type: application/json

3.48.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 78 JSON Schema file Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Languages(M)	Array	True	The value of this property shall be a Description consisting of an RFC 5646 language code.
Schema (M)	String	True	The value of this property shall be the value of the @odata.type property for that schema and shall conform to the syntax specified in the Redfish specification for the Type property.

Location (M)	Array	True	Location information for this schema file. Refer Table 79 JSON Schema File Location Property.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.

Table 79 JSON Schema File Location Property

Name	Type	Read Only	Description
Language	String	True	The language code for the file the schema is in.
Uri	String	True	Link to locally available URI for schema. The value of this property shall be a URI co-located with the Redfish service that specifies the location of the schema file. This property shall only be used for individual schema files. The file name portion of the URI shall conform to the format [SchemaType].[MajorVersion].[MinorVersion].json and be in conformance with the Redfish specification.
ArchiveUri	String	True	<p>If the schema is hosted on the service in an archive file, this is the link to the archive file. The value of this property shall be a URI co-located with the Redfish service that specifies the location of the schema file. This property shall only be used for archive files (zip or other formats). The value of ArchiveFile shall have the file name of the individual schema file within the archive file.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>
PublicationUri	String	True	<p>Link to publicly available (canonical) URI for schema. The value of this property shall be a URI not co-located with the Redfish service that specifies the canonical location of the schema file.</p> <p>This property shall only be used for individual schema files.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific</p>

			platform libraries support and hook between the specific libraries and gami module should be added.
ArchiveFile	String	True	<p>If the schema is hosted on the service in an archive file, this is the name of the file within the archive. The value of this property shall be the file name of the individual schema file within the archive file specified by the ArchiveUri property. The file name shall conform to the format</p> <p>[SchemaType].[MajorVersion].[MinorVersion].json and be in conformance with the Redfish specification.</p> <p>Note: Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>

3.49 SessionCollection

It displays the collection of links to each session.

Note: The list will be populated and point the odata.id links to the session resources, only if the sessions are created via the below given POST API otherwise the Members list will be empty.

3.49.1 GET

3.49.1.1 Request

https://{{ip}}/redfish/v1/SessionService/Sessions

Content-Type: application/json

3.49.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.49.2 POST [Creating new Session]

3.49.2.1 Request

POST https://{{ip}}/redfish/v1/SessionService/Sessions



Content-Type: application/json

3.49.2.2 Response

The response status is 201 and the response body is a GET Response with the properties of the newly created Session. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note:

Maximum number of active sessions is limited to 20.

Creation of new Session will add log in Managers EventLog.

3.50 Session Service

This resource shall be used to represent the Session Service Properties for a Redfish implementation. It represents the properties for the service itself and has links to the actual list of sessions.

3.50.1 GET

3.50.1.1 Request

https://{{ip}}/redfish/v1/SessionService

Content-Type: application/json

3.50.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 80 SessionService Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1

@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Status	Object	True	Refer Section 3.3 for Resource.Oem.
ServiceEnabled(C)	Boolean	False	This indicates whether this service is enabled. Default it will be null value
Session Timeout(C)	Number	False	This is the number of seconds of inactivity that a session may have before the session service closes the session due to inactivity. Minimum Value :30 & Maximum Value : 86400.
Sessions	Object	True	This property shall contain the link to a collection of Sessions.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.

3.50.2 PATCH

3.50.2.1 Request

PATCH `https://{{ip}}/redfish/v1/SessionService`

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 80 SessionService Property for which ReadOnly is False that can be sent as Request body in json format.

Example Request Body for Enabling or Disabling SessionService and setting the session timeout:-

```
{
  "ServiceEnabled": true,
  "SessionTimeout": 300
}
```


}

3.50.2.2 Response

The response status is success with status code as 200 with GET response. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.51 Session

Displays the Session details for the given session.

Note: This URI is available only when the session is created a by the above given POST API.

3.51.1 GET

3.51.1.1 Request

https://{{ip}}/redfish/v1/SessionService/Sessions/{{session_id}}

Content-Type: application/json

3.51.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 81 Session Property

Name	Type	Read Only	Description
@odata.cont ext	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.

Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
UserName	String	True	The UserName for the account for this session. The value of this property shall be the UserName that matches a registered account identified by a ManagerAccount resource registered with the Account Service.
Password	String	True	This property is used in a POST to specify a password when creating a new session. The value of this property shall be the password for this session. Note: This property would not be shown in GET Response.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.

3.51.2 DELETE

3.51.2.1 Request

DELETE https://{{ip}}/redfish/v1/SessionService/Sessions/{{session_id}}

Content-Type: application/json

3.51.2.2 Response

The response status is 204 and no response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note: Deletion of Session or Session Timeout will add log in Managers EventLog

3.52 Message Registry File Collection

Contains a list of registries supported by the redfish service.

3.52.1 GET

3.52.1.1 Request

<https://{{ip}}/redfish/v1/Registries>

Content-Type: application/json

3.52.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.53 MessageRegistry

This is the schema definition for all Message Registries. It represents the properties for the registries themselves. The MessageId is formed per the Redfish specification. It consists of the RegistryPrefix concatenated with the version concatenated with the unique identifier for the message registry entry.

For Eg:/redfish/v1/Registries/Base.1.5.0.json represents the Base Registry containing the messages for the redfish server.

3.53.1 GET

3.53.1.1 Request

https://{{ip}}/redfish/v1/Registries/{{Registry_instance.json}}

Content-Type: application/json

3.53.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 82 MessageRegistry Properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document

Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Language(M)	String	True	This is the RFC 5646 compliant language code for the registry. The value of this property shall be a Description consisting of an RFC 5646 language code.
RegistryPrefix(M)	String	True	This is the single word prefix used in messageIDs which uniquely identifies all of the messages in this registry as belonging to this registry.
RegistryVersion(M)	String	True	This is the message registry version which is used in the middle portion of a messageID. The format of this Description shall be of the format majorversion.minorversion.errata in compliance with Protocol Version Section of the Redfish specification
OwningEntity(M)	String	True	The value of this property shall be a Description that represents the publisher of this registry.
Messages(M)	Object	True	The pattern property shall represent the suffix to be used in the MessageID and shall be unique within this message registry.

3.54 MessageRegistryFile

This resource shall be used to represent the Schema File locator resource for a Redfish implementation. For Eg:/redfish/v1/Registries/Base.1.5.0 represents the Base registry file.

3.54.1 GET

3.54.1.1 Request

https://{{ip}}/redfish/v1/Registries/{{Registry_instance}}

Content-Type: application/json

3.54.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 83 Message Registry File Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Languages (M)	Array	True	Language codes for the schemas available. The value of this property shall be a Description consisting of an RFC 5646 language code.
Registry (M)	String	True	The value of this property shall be the value of the Registry Name, Major and Minor version and shall conform to the syntax specified in the Redfish specification for the MessageId property without the MessageKey.
Location (M)	Array	True	Location information for this schema file. Refer Table 79 JSON Schema File Location Property

3.55 NetworkInterfaceCollection

It displays the collection of network interface resource instances available in the system.

Note: NetworkInterfaceCollection resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.55.1 GET

3.55.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/NetworkInterfaces

Content-Type: application/json

3.55.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.56 NetworkInterface

A NetworkInterface contains references linking NetworkAdapter, NetworkPort, and NetworkDeviceFunction resources and represents the functionality available to the containing system.

Note: NetworkInterface resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.56.1 GET

3.56.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/NetworkInterfaces/{{NetworkInterface_instance}}

Content-Type: application/json

3.56.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 84 NetworkInterface Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1

Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Status	Object	True	Refer Section 3.3 for Resource.Oem.			
Links	Object	True	Links for this controller.			
			Name	Type	Read Only	Description
			NetworkAdapter(N)	Object	True	A reference to the collection of NetworkAdapter associated with this NetworkInterface.
NetworkDeviceFunctions (N)	Object	True	A reference to the collection of NetworkDeviceFunction associated with this NetworkInterface.			
NetworkPorts (N)	Object	True	A reference to the collection of NetworkPorts associated with this NetworkInterface.			
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			

3.57 NetworkDeviceFunctionCollection

It displays the collection of NetworkDeviceFunction resource instances.

Note: NetworkDeviceFunctionCollection resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.57.1 GET

3.57.1.1 Request

<https://{{ip}}/redfish/v1/Chassis/Self/NetworkAdapters/{{NetworkAdapter instance}}/NetworkDeviceFunctions>



Content-Type: application/json

3.57.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.58 NetworkDeviceFunction

A Network Device Function represents a logical interface exposed by the network adapter.

Note: NetworkDeviceFunction resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.58.1 GET

3.58.1.1 Request

https://{{ip}}/redfish/v1/Chassis/Self/NetworkAdapters/{{NetworkAdapter_instance}}/NetworkDeviceFunctions/{{NetworkDeviceFunctions_instance}}

Content-Type: application/json

3.58.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 85 NetworkDeviceFunction

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document

Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Status	Object	True	Refer Section 3.3 for Resource.Oem.			
NetDevFunc Type	String	True	The configured capability of this network device function.			
			Enum	Description		
			Disabled	Neither enumerated nor visible to the operating system.		
			Ethernet	Appears to the operating system as an Ethernet device.		
			FibreChannel	Appears to the operating system as a Fibre Channel device.		
			iSCSI	Appears to the operating system as an iSCSI device.		
			FibreChannelOverEthernet	Appears to the operating system as an FCoE device.		
DeviceEnabled	Boolean	True	Whether the network device function is enabled. Disabled network device functions shall not be enumerated or seen by the operating system.			
NetDevFunc Capabilities	Array	True	Capabilities of this network device function. Array Items are of Type NetDevFuncType.			
Ethernet	Object		This object shall contain Ethernet capabilities, status, and configuration values for this network device function.			
			Name	Type	Read Only	Description
			Permanent MACAddress	String	True	This is the permanent MAC address assigned to this network device function (physical function).
			MACAddress	String	False	This is the currently configured MAC address of the (logical port) network device function.

			VLANs	Object	True	This is a reference to a collection of VLANs and is only used if the interface supports more than one VLANs.
			MTUSize	Number	False	The Maximum Transmission Unit (MTU) configured for this network device function.
iSCSIBoot	Object		This object shall contain iSCSI boot capabilities, status, and configuration values for this network device function. Please refer Table 86 iSCSIBoot Properties. Note : The iSCSIBoot attributes can be deleted / removed by patching null value to each property inside iSCSIBoot object.			
FibreChannel	Object		This object shall contain Fibre Channel capabilities, status, and configuration values for this network device function. Please refer Table 87 FibreChannel Properties.			
BootMode	String	False	The boot mode configured for this network device function.			
			Enum		Description	
			Disabled		Do not indicate to UEFI/BIOS that this device is bootable.	
			PXE		Boot this device using the embedded PXE support. Only applicable if the NetworkDeviceFunctionType is set to Ethernet.	
			iSCSI		Boot this device using the embedded iSCSI boot support and configuration. Only applicable if the NetworkDeviceFunctionType is set to iSCSI.	
			FibreChannel		Boot this device using the embedded Fibre Channel support and configuration. Only applicable if the NetworkDeviceFunctionType is set to FibreChannel.	
			FibreChannelOverEthernet		Boot this device using the embedded Fibre Channel over Ethernet (FCoE)	

				boot support and configuration. Only applicable if the NetworkDeviceFunctionType is set to FibreChannelOverEthernet.		
VirtualFunctionsEnabled	Boolean	True	Whether Single Root I/O Virtualization (SR-IOV) Virtual Functions (VFs) are enabled for this Network Device Function.			
MaxVirtualFunctions	Number	True	The number of virtual functions (VFs) that are available for this Network Device Function.			
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			
AssignablePhysicalPorts	Array	True	An array of physical ports to which this network device function may be assigned.			
AssignablePhysicalPorts@odata.count	Number	True	Number of AssignablePhysicalPorts available.			
Links	Object	True	Links for this controller.			
			Name	Type	Read Only	Description
			Endpoints@odata.count	Number	True	An integer representing the number of items in a collection.
			Endpoints	Array	True	An array of references to endpoints associated with this network device function. The type shall contain an array property whose members reference resources, of type Endpoint, which are associated with this network device function.
			PhysicalPortAssignment	Object	True	The physical port that this network device function is currently assigned to.



			PCIeFunction	Object	True	A reference to the collection of members of this collection. Note: Will be populated through Host Interface.
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Table 86 iSCSIBoot Properties

Name	Type	Read Only	Description	
IPAddressType	String	False	Allowable values are as following Note: Redfish.AllowableValues array should always be shown to indicate the supported allow values Default it will be null value	
			Enum	Description
			IPv4	IPv4 addressing is used for all IP-fields in this object.
			IPv6	IPv6 addressing is used for all IP-fields in this object.
InitiatorIPAddress	String	False	The type of IP address (IPv6 or IPv4) being populated in the iSCSIBoot IP address fields. Default it will be null value	
InitiatorName	String	False	The iSCSI boot initiator name. Default it will be null value	
InitiatorDefaultGateway	String	False	The IPv6 or IPv4 iSCSI boot default gateway. Default it will be null value	
InitiatorNetmask	String	False	The IPv6 or IPv4 netmask of the iSCSI boot initiator. Default it will be null value	
TargetInfoViaDHCP	Boolean	False	Whether the iSCSI boot target name, LUN, IP address, and netmask should be obtained from DHCP. Default it will be null value	
PrimaryTargetName	String	False	The name of the iSCSI primary boot target. Default it will be null value	
PrimaryTargetIPAddress	String	False	The IP address (IPv6 or IPv4) for the primary iSCSI boot target. Default it will be null value	

PrimaryTargetTCPPort	Number	False	The TCP port for the primary iSCSI boot target. Default it will be null value
PrimaryLUN	Number	False	The logical unit number (LUN) for the primary iSCSI boot target. Default it will be null value
PrimaryVLANEnable	Boolean	False	This indicates if the primary VLAN is enabled. Default it will be null value
PrimaryVLANId	Number	False	The 802.1q VLAN ID to use for iSCSI boot from the primary target. Default it will be null value Minimum = "0" Maximum = "4094"
PrimaryDNS	String	False	The IPv6 or IPv4 address of the primary DNS server for the iSCSI boot initiator. Default it will be null value
SecondaryTargetName	String	False	The name of the iSCSI secondary boot target. Default it will be null value
SecondaryTargetIPAddresses	String	False	The IP address (IPv6 or IPv4) for the secondary iSCSI boot target. Default it will be null value
SecondaryTargetTCPPort	Number	False	The TCP port for the secondary iSCSI boot target. Default it will be null value
SecondaryLUN	Number	False	The logical unit number (LUN) for the secondary iSCSI boot target. Default it will be null value
SecondaryVLANEnable	Boolean	False	This indicates if the secondary VLAN is enabled. Default it will be null value
SecondaryVLANId	Number	False	The 802.1q VLAN ID to use for iSCSI boot from the secondary target. Default it will be null value Minimum = "0" Maximum = "4094"
SecondaryDNS	String	False	The IPv6 or IPv4 address of the secondary DNS server for the iSCSI boot initiator. Default it will be null value
IPMaskDNSViaDHCP	Boolean	False	Whether the iSCSI boot initiator uses DHCP to obtain the initiator name, IP address, and netmask. Default it will be null value

RouterAdvertisementEnabled	Boolean	False	Whether IPv6 router advertisement is enabled for the iSCSI boot target. Default it will be null value	
AuthenticationMethod	String	False	The iSCSI boot authentication method for this network device function. Default it will be null value	
			Allowable values are as following	
			Note: Redfish.AllowableValues array should always be shown to indicate the supported allow values	
			Enum	Description
			None	No iSCSI authentication is used.
CHAP	iSCSI Challenge Handshake Authentication Protocol (CHAP) authentication is used.			
MutualCHAP	iSCSI Mutual Challenge Handshake Authentication Protocol (CHAP) authentication is used.			
CHAPUsername	String	False	The username for CHAP authentication. Default it will be null value	
CHAPSecret	String	False	The shared secret for CHAP authentication. Default it will be null value	
MutualCHAPUsername	String	False	The CHAP Username for 2-way CHAP authentication. Default it will be null value	
MutualCHAPSecret	String	False	The CHAP Secret for 2-way CHAP authentication. Default it will be null value	

Table 87 FibreChannel Properties

Name	Type	Read Only	Description
PermanentWWPN	String	True	The value of this property shall be the permanent World-Wide Port Name (WWPN) of this network device function (physical function). This value is typically programmed during the manufacturing time. This address is not assignable.

PermanentW WNN	String	True	The value of this property shall be the permanent World-Wide Node Name (WWNN) of this network device function (physical function). This value is typically programmed during the manufacturing time. This address is not assignable.	
FibreChannel Id	String	True	The Fibre Channel Id assigned by the switch for this interface.	
WWPN	String	False	The value of this property shall be the effective current World-Wide Port Name (WWPN) of this network device function (physical function). If an assignable WWPN is not supported, this is a read only alias of the PermanentWWPN.	
WWNN	String	False	The value of this property shall be the effective current World-Wide Node Name (WWNN) of this network device function (physical function). If an assignable WWNN is not supported, this is a read only alias of the PermanentWWNN.	
WWNSource	String	False	The configuration source of the WWNs for this connection (WWPN and WWNN).	
			Enum	Description
			ConfiguredLocally	The set of FC/FCoE boot targets was applied locally through API or UI.
			ProvidedByFabric	The set of FC/FCoE boot targets was applied by the Fibre Channel fabric.
FCoELocalV LANId	Number	False	For FCoE connections, the value of this property shall be the VLAN ID configured locally by setting this property. This value shall be used for FCoE traffic to this network device function during boot unless AllowFIPVLANDiscovery is true and a valid FCoE VLAN ID is found via the FIP VLAN Discovery Protocol. Minimum = "0" Maximum = "4094"	
AllowFIPVLA NDiscovery	Boolean	False	For FCoE connections, the value of this property shall be a boolean indicating whether the FIP VLAN Discovery Protocol is used to determine the FCoE VLAN ID selected by the network device function for the FCoE connection. If true, and the FIP VLAN Discovery succeeds, the FCoEActiveVLANId property shall reflect the FCoE VLAN ID to be used for all FCoE traffic. If false, or if the FIP VLAN Discovery protocol fails, the	

			FCoELocalVLANId shall be used for all FCoE traffic and the FCoEActiveVLANId shall reflect the FCoELocalVLANId.			
FCoEActiveVLANId	Number	True	For FCoE connections, the value of this property shall be null or a VLAN ID currently being used for FCoE traffic. When the FCoE link is down this value shall be null. When the FCoE link is up this value shall be either the FCoELocalVLANId property or a VLAN discovered via the FIP protocol. Minimum = "0" Maximum = "4094"			
BootTargets	Array	False	An array of Fibre Channel boot targets configured for this network device function.			
			Name	Type	Read Only	Description
			WWPN	String	False	The World-Wide Port Name to boot from.
			LUNID	String	False	The Logical Unit Number (LUN) ID to boot from on the device referred to by the corresponding WWPN.
			BootPriority	Number	False	The value of this property shall be the relative priority for this entry in the boot targets array. Lower numbers shall represent higher priority, with zero being the highest priority. The BootPriority shall be unique for all entries of the BootTargets array.

3.59 NetworkAdapterCollection

It displays the collection of network adapter resource instances available in the system.

Note: NetworkAdapterCollection resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))



3.59.1 GET

3.59.1.1 Request

https://{{ip}}/redfish/v1/Chassis/Self/NetworkAdapters

Content-Type: application/json

3.59.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.60 NetworkAdapter

A NetworkAdapter represents the physical network adapter capable of connecting to a computer network. Examples include but are not limited to Ethernet, Fibre Channel, and converged network adapters.

Note: NetworkAdapter resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section 7](#))

3.60.1 GET

3.60.1.1 Request

https://{{ip}}/redfish/v1/Chassis/Self/NetworkAdapters/{{NetworkAdapter_instance}}

Content-Type: application/json

3.60.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 88 NetworkAdapter Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1

@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Status	Object	True	Refer Section 3.3 for Resource.Oem.
Manufacturer	String	True	The manufacturer or OEM of this network adapter.
Model	String	True	The model string for this network adapter.
SKU	String	True	The manufacturer SKU for this network adapter.
SerialNumber	String	True	The serial number for this network adapter.
PartNumber	String	True	Part number for this network adapter.
Controllers	Array		The set of network controllers ASICs that make up this NetworkAdapter.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.
NetworkDeviceFunctions (N)	Object	True	Contains a reference to the members of NetworkDeviceFunctionCollection.
NetworkPorts (N)	Object	True	Contains a reference to the members of NetworkPortCollection.
Assembly	Object	True	The link to the assembly Resource associated with this adapter.

Table 89 Controller Properties

Name	Type	Read Only	Description
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FirmwarePackageVersion	String	True	Resource Identifier			
Location	Object	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource.Location.			
PCIInterface	Object	True	The PCIe interface details for this controller. Refer Table 99 PCIInterface Properties.			
Identifiers	Object	True	The Durable names for the network adapter.			
			Name	Type	Read Only	Description
			DurableName	String	True	This indicates the world wide, persistent name of the resource.
			DurableName Format	String	True	This represents the format of the DurableName property.
Links	String	True	Links for this controller.			
			Name	Type	Read Only	Description
			PCIDevices@odata.count	Number	True	An integer representing the number of items in a collection. Note: Require PCIe support, only north bound available.
			PCIDevices	Array		An array of references to the PCIeDevice collection. Note: Require PCIe support, only north bound available.
Oem	Object	True	Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is			

						implemented according to “How to Add OEM extensions” document	
			NetworkPorts	Array	True	An array of links to the NetworkPorts associated with this Network Controller.	
			NetworkPorts@odata.count	Number	True	An integer representing the number of items in a collection.	
			NetworkDeviceFunctions@odata.count	Number	True	An integer representing the number of items in a collection.	
			NetworkDeviceFunctions	Array		An array of references to the NetworkDeviceFunctions.	
ControllerCapabilities	String	True	Description of the Resource				
			Name	Type	Read Only	Description	
			NetworkPortCount	Number	True	The number of physical ports on this controller.	
			NetworkDeviceFunctionCount	Number	True	The maximum number of physical functions available on this controller.	
			DataCenterBridging	Object		This object shall contain capability, status, and configuration values related to Data Center Bridging (DCB) for this controller.	
			VirtualizationOffload	Object		This object shall contain	
						capability, status, and configuration values related to virtualization offload for this controller.	

			NPAR	Object		NIC Partitioning (NPAR) capabilities for this controller.
			NPIV	Object		N_Port ID Virtualization (NPIV) capabilities for this controller.

Table 90 DataCenterBridging Properties

Name	Type	Read Only	Description
Capable	Boolean	True	Whether this controller is capable of Data Center Bridging (DCB).

Table 91 VirtualizationOffload Properties

Name	Type	Read Only	Description			
VirtualFunction	Object	True	Name	Type	Read Only	Description
			DeviceMaxCount	Number	True	The maximum number of Virtual Functions (VFs) supported by this controller.
			NetworkPortMaxCount	Number	True	The maximum number of Virtual Functions (VFs) supported per network port for this controller.
			MinAssignmentGroupSize	Number	True	The minimum number of Virtual Functions (VFs) that can be allocated or moved between physical functions for this controller.
SRIOV	String	True	Single-Root Input/Output Virtualization (SR-IOV) capabilities.			
			Name	Type	Read Only	Description



			SRIOV/VEPA Capable	Boolean	True	Whether this controller supports Single Root Input/Output Virtualization (SR-IOV) in Virtual Ethernet Port Aggregator (VEPA) mode
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Table 92 NPIV Properties

Name	Type	Read Only	Description
MaxDeviceLogins	Number	True	The maximum number of N_Port ID Virtualization (NPIV) logins allowed simultaneously from all ports on this controller.
MaxPortLogins	Number	True	The maximum number of N_Port ID Virtualization (NPIV) logins allowed per physical port on this controller.

Table 93 NPAR Properties

Name	Type	Read Only	Description
NparCapable	Boolean	True	Indicates whether or not NIC function partitioning is supported by a controller.
NparEnabled	Boolean	True	When true, NIC function partitioning is active on this controller.

3.61 Storage Collection

It displays the collection of storage resource instances available in the system.

Note: StorageCollection resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.61.1 GET

3.61.1.1 Request

`https://{{ip}}/redfish/v1/Systems/Self/Storage`



Content-Type: application/json

3.61.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.62 Storage

Storage defines a storage subsystem and its respective properties. A storage subsystem represents a set of storage controllers (physical or virtual) and the resources such as volumes that can be accessed from that subsystem.

Note: Storage resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.62.1 GET

3.62.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/Storage/{{Storage_instance}}

Content-Type: application/json

3.62.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 94 Storage Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 .

			Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Status	Object	True	Refer Section 3.3 for Resource.Oem.			
Links	Object	True	Contains references to other resources that are related to this resource.			
			Name	Type	Read Only	Description
			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
			Enclosures@odata.count	Number	True	An integer representing the number of items in a collection.
			Enclosures (N)	Array	True	An array of references to the chassis to which this storage subsystem is attached
StorageControllers@odata.count	Number	True	An integer representing the number of items in a collection.			
StorageControllers	Array	True	A collection that indicates all the storage controllers that this resource represents.			
Drives@odata.count	Number	True	An integer representing the number of items in a collection.			
Drives	Array	True	A collection that indicates all the drives attached to the storage controllers that this resource represents.			

Volumes	Object	True	A collection that indicates all the volumes produced by the storage controllers that this resource represents.
Redundancy@odata.count	Number	True	An integer representing the number of items in a collection.
Redundancy(N)	Array	True	Redundancy information for the storage subsystem. Note: Redundancy information can be configured through redis commands as specified in the Configurable Properties Section in “MegaRAC Redfish - How to Add OEM extensions” document

Table 95 Storage Controller Properties

Name	Type	Read Only	Description			
MemberId	String	True	This is the identifier for the member within the collection.			
Status	Object	True	Refer Section 3.3 for Resource.Oem.			
Assembly	Object	True	The link to the assembly associated with this storage controller.			
ControllerRates			This type describes the various controller rates used for processes such as Volume Rebuild or Consistency Checks.			
			Name	Type	Read Only	Description
			ConsistencyCheckRatePercent	Number	True	The percentage of controller Resources used for performing a data consistency check on volumes.
			RebuildRatePercent	Number	True	The percentage of controller Resources used for rebuilding/repairing volumes.
TransformationRatePercent	Number	True	The percentage of controller Resources used for transforming volumes from			

						one configuration to another.
Name	String	True	The name of the Storage Controller.			
Ports	Object	True	The link to the collection of Ports that exist on the storage controller.			
SpeedGbps	Number	True	The value of this property shall represent the speed of the Storage bus interface (in Gigabits per second).			
FirmwareVersion	String	True	The firmware version of this storage Controller.			
Manufacturer	String	True	This is the manufacturer of this storage controller.			
Model	String	True	This is the model number for the storage controller.			
SKU	String	True	This is the SKU for this storage controller.			
SerialNumber	String	True	The serial number for this storage controller.			
PartNumber	String	True	The part number for this storage controller.			
AssetTag	String	False	The user assigned asset tag for this storage controller. Default it will be null value			
SupportedControllerProtocols	Array	True	Refer Table 95 Storage Controller Properties - Protocol Properties for allowed Enum in Array.			
SupportedDeviceProtocols	Array	True	Refer Table 96 Protocol Properties - Protocol Properties for allowed Enum in Array.			
Identifiers	Array	True	This property shall contain a list of all known durable names for the associated storage controller. Please refer Resource Section 3.3 .			
Location	Object	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource.Location.			
CacheSummary	Object	True	This object describes the cache memory of the storage controller in general detail.			
			Name	Type	Read Only	Description

			PersistentCacheSizeMiB	Number	True	The portion of the cache memory that is persistent, measured in MiB.
			TotalCacheSizeMiB	Number	True	The total configured cache memory, measured in MiB.
			Status	Object	True	Refer Section 3.3 for Resource.Oem
PCIInterface	Object		The PCIe interface details for this controller. Refer Table 99 PCIeInterface Properties.			
SupportedRAIDTypes	Array	True	This object describes the RAID Types supported by the storage controller.			
			Enum	Description		
			RAID00	A placement policy that creates a RAID 0 stripe set over two or more RAID 0 sets		
			RAID01	A data placement policy that creates a mirrored device (RAID 1) over a set of striped devices (RAID 0)		
			RAID1	A placement policy where each logical block of data is stored on more than one independent storage device		
			RAID10	A placement policy that creates a striped device (RAID 0) over a set of mirrored devices (RAID 1)		
			RAID10E	A placement policy that uses a RAID 0 stripe set over two or more RAID 10 sets		
			RAID10Triple	A placement policy that uses a striped device (RAID 0) over a set of triple mirrored devices (RAID 1Triple)		
			RAID1E	A placement policy that uses a form of mirroring implemented over a set of independent storage devices where logical blocks are duplicated on a pair of independent storage devices so that data is uniformly distributed across the storage devices		

			RAID1 Triple	A placement policy where each logical block of data is mirrored three times across a set of three independent storage devices
			RAID3	A placement policy using parity-based protection where logical bytes of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device
			RAID4	A placement policy using parity-based protection where logical blocks of data are uniformly distributed across a set of independent storage devices and where the parity is stored on a dedicated independent storage device
			RAID5	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and one logical block of parity across a set of 'n+1' independent storage devices where the parity and data blocks are interleaved across the storage devices
			RAID50	A placement policy that uses a RAID 0 stripe set over two or more RAID 5 sets of independent storage devices
			RAID6	A placement policy using parity-based protection for storing stripes of 'n' logical blocks of data and two logical blocks of independent parity across a set of 'n+2' independent storage devices where the parity and data blocks are interleaved across the storage devices
			RAID60	A placement policy that uses a RAID 0 stripe set over two or more RAID 6 sets of independent storage devices
			RAID6 TP	A placement policy that uses parity-based protection for storing stripes of 'n' logical blocks of data and three logical blocks of independent parity across a set of 'n+3' independent storage devices where the parity

				and data blocks are interleaved across the storage devices. This is commonly referred to as Triple Parity RAID. Data stored using this form of RAID is able to survive any three independent storage device failures without data loss		
Links	Object	True	Contains references to other resources that are related to this resource.			
			Name	Type	Read Only	Description
			Endpoints@odata.count	Number	True	An integer representing the number of items in a collection.
			Endpoints (N)	Array	True	The value of this property shall be a reference to the resources that this system is associated with and shall reference a resource of type Endpoint. Note: These will be available only as a part of FPX Product.

Table 96 Protocol Properties

Member Name	Description
PCIe	PCI Express (Vendor Proprietary).
AHCI	Advanced Host Controller Interface.
UHCI	Universal Host Controller Interface.
SAS	Serial Attached SCSI.
SATA	Serial AT Attachment.
USB	Universal Serial Bus.
NVMe	Non-Volatile Memory Express.
FC	Fibre Channel.



iSCSI	Internet SCSI.
FCoE	Fibre Channel over Ethernet.
NVMeOverFabrics	NVMe over Fabrics.
SMB	Server Message Block (aka CIFS Common Internet File System).
NFSv3	Network File System version 3.
NFSv4	Network File System version 4.
HTTP	Hypertext Transport Protocol.
HTTPS	Secure Hypertext Transport Protocol.
FTP	File Transfer Protocol.
SFTP	Secure File Transfer Protocol.

3.63 Volume Collection

It displays the collection of volume resource instances available in the system.

Note: VolumeCollection resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.63.1 GET

3.63.1.1 Request

`https://{{ip}}/redfish/v1/Systems/Self/Storage/{{Storage_instance}}/Volumes`

Content-Type: application/json

3.63.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.64 Volume

Volume contains properties used to describe a volume, virtual disk, LUN, or other logical storage entity for any system.

Note: Volume resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.64.1 GET

3.64.1.1 Request

`https://{{ip}}/redfish/v1/Systems/Self/Storage/{{Storage_instance}}/Volumes/
{{Volume_instance}}`

Content-Type: application/json

3.64.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 97 Volume Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Status	Object	True	Refer Section 3.3 for Resource.Oem.
CapacityBytes	Number	True	This property shall contain the size in bytes of the associated volume.
VolumeType	String	True	This property shall contain the type of the associated Volume.

			Enum	Description
			RawDevice	The volume is a raw physical device without any RAID or other virtualization applied.
			NonRedundant	The volume is a non-redundant storage device.
			Mirrored	The volume is a mirrored device.
			StripedWithParity	The volume is a device which uses parity to retain redundant information.
			SpannedMirrors	The volume is a spanned set of mirrored devices.
			SpannedStripesWithParity	The volume is a spanned set of devices which uses parity to retain redundant information.
Encrypted	Boolean, False	True	This property shall contain a boolean indicator if the Volume is currently utilizing encryption or not. Default it will be null value	
EncryptionTypes	Array	True	This property shall contain the types of encryption used by this Volume.	
			Enum	Description
			NativeDriveEncryption	The volume is utilizing the native drive encryption capabilities of the drive hardware.
			ControllerAssisted	The volume is being encrypted by the storage controller entity.
			SoftwareAssisted	The volume is being encrypted by software running on the system or the operating system.
Identifiers	Array	True	This property shall contain a list of all known durable names for the associated volume.	
BlockSizeBytes	Number	True	The size of the smallest addressable unit (Block) of this volume in bytes.	
Operations	Array		The operations currently running on the Volume.	

			Name	Type	Read only	Description
			OperationName	String	True	The name of the operation.
			PercentageComplete	Number	True	The percentage of the operation that has been completed.
			AssociatedTask	Object	True	A reference to the task associated with the operation if any.
OptimumIOSizeBytes	Number	True	This property shall contain the optimum IO size to use when performing IO on this volume. For logical disks, this is the stripe size. For physical disks, this describes the physical sector size.			
Links			An array of references to the drives which contain this volume. This will reference Drives that either wholly or only partly contain this volume.			
			Name	Type	Read only	Description
			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
			Drives@odata.count	Number	True	An integer representing the number of items in a collection.
			Drives (N)	Array	True	An array of references to the chassis to which this storage subsystem is attached
Actions	Object	True	Volume.Initialize is the available actions for this resource			

3.65 PCIeDevice Collection

It displays the collection of PCIeDevice resource instances available in the Chassis.

Note: PCIeDeviceCollection resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.65.1 GET

3.65.1.1 Request

`https://{{ip}}/redfish/v1/Chassis/Self/PCIeDevices`

Content-Type: application/json

3.65.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.66 PCIeDevice

This is the schema definition for the PCIeDevice resource. It represents the properties of a PCIeDevice attached to a System.

Note: In BMC, PCIeDevice Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.66.1 GET

3.66.1.1 Request

`https://{{ip}}/redfish/v1/Chassis/Self/PCIeDevices/{{PCIeDevices_instance}}`

Content-Type: application/json

3.66.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 98 PCIeDevice Properties

Name	Type	Read Only	Description	
@odata.context	String	True	Refer Section 3.1	
@odata.id	String	True	Refer Section 3.1	
@odata.type	String	True	Refer Section 3.1	
@odata.etag	String	True	Refer Section 3.1	
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document	
Id(M)	String	True	Resource Identifier	
Name(M)	String	True	Name of the Resource	
Description	String	True	Provides description of the resource. Refer Section 3.3	
Status	Object	True	Refer Section 3.3 for Resource.Oem.	
Manufacturer	String	True	This is the manufacturer of this PCIe device.	
Model	String	True	This is the model number for the PCIe device.	
SKU	String	True	This is the SKU for this PCIe device.	
SerialNumber	String	True	The serial number for this PCIe device.	
PartNumber	String	True	The part number for this PCIe device.	
AssetTag	String	False	The user assigned asset tag for this PCIe device.	
DeviceType	String	True	The device type for this PCIe device.	
			Enum	Description
			SingleFunction	A single-function PCIe device.
			MultiFunction	A multi-function PCIe device.
			Simulated	A PCIe device which is not currently physically present, but is being simulated by the PCIe infrastructure.

FirmwareVersion	String	True	The version of firmware for this PCIe device.			
Links	Object	True	The links object contains the links to other resources that are related to this resource.			
			Name	Type	Read Only	Description
			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
			Chassis	Array	True	An array of references to the chassis in which the PCIe device is contained.
			Chassis@odata.count	Number	True	An integer representing the number of items in a collection.
Actions	Object	True	AmiBios.ChangeState is the only action under Oem.			
PCleFunctions	Object	True	An reference to PCleFunctionsCollection exposed by this device.			
PCleInterface	Object	True	This is the definition for a PCI Interface object. Refer Table 99 PCIeInterface Properties			
Assembly	Object	True	A reference to the Assembly resource associated with this PCIe device.			

Table 99 PCIeInterface Properties

Name	Type	Read Only	Description
LanesInUse	Number	True	This is the number of PCIe lanes in use by this device.
MaxLanes	Number	True	This is the number of PCIe lanes supported by this device.



MaxPCleType	String	True	The highest version of the PCIe specification supported by this device. Refer Table 98 PCIeDevice Properties
PCleType	String	True	The version of the PCIe specification in use by this device.
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document

Table 100 PCIe Service Properties

Enum	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.

3.67 PCIeFunction Collection

It displays the collection of PCIeFunctions resource instances available under the PCIeDevice.

Note: PCIeFunctionCollection resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.67.1 GET

3.67.1.1 Request

https://{{ip}}/redfish/v1/Chassis/Self/PCleDevices/{{PCleDeviceInstance}}/
PCleFunctions

Content-Type: application/json



3.67.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.68 PCIeFunction

This is the schema definition for the PCIeFunction resource. It represents the properties of a PCIeFunction attached to a System.

Note: In BMC, PCIeFunctions Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.68.1 GET

3.68.1.1 Request

`https://{{ip}}/redfish/v1/Chassis/Self/PCIeDevices/{{PCIeDevices_instance}}/PCIeFunctions/{{PCIeFunctions_instance}}`

Content-Type: application/json

3.68.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 101 PCIeFunction Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1

Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document		
Id(M)	String	True	Resource Identifier		
Name(M)	String	True	Name of the Resource		
Description	String	True	Provides description of the resource. Refer Section 3.3		
Status	Object	True	Refer Section 3.3 for Resource.Oem. PCIeFunction will take the State & Health values as per the parent PCIeDevice.		
FunctionId	Number	True	The the PCIe Function identifier.		
FunctionType		True	The value of this property shall be the function type of the PCIe device function such as Physical or Virtual.		
DeviceClass		True	The value of this property shall be the device class of the PCIe device function such as Storage, Network, Memory etc.		
DeviceId	String	True	The Device ID of this PCIe function.		
VendorId	String	True	The Vendor ID of this PCIe function.		
ClassCode	String	True	The Class Code of this PCIe function.		
RevisionId	String	True	The Revision ID of this PCIe function.		
SubsystemId	String	True	The Subsystem ID of this PCIe function.		
SubsystemVendorId	String	True	The Subsystem Vendor ID of this PCIe function.		
Actions	Object	True	AmiBios.ChangeState is the only action under Oem. Note : This action is supported by ami_bios DRE using HostInterface communication.		
Links	Object	The links object contains the links to other resources that are related to this resource.			
		Name	Type	Read Only	Description
		Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is

					implemented according to “How to Add OEM extensions” document	
			Drives	Array	True	An array of references to the drives which the PCIe device produces.
			Drives@odata.count	Number	True	An integer representing the number of items in a collection.
			StorageControllers	Array	True	An array of references to the storage controllers which the PCIe device produces.
			StorageControllers@odata.count	Number	True	An integer representing the number of items in a collection.
			EthernetInterfaces	Array	True	An array of references to the ethernet interfaces which the PCIe device produces.
			EthernetInterfaces@odata.count	Number	True	An integer representing the number of items in a collection.
			NetworkDeviceFunctions	Array	True	An array of references to the Network Device Functions which the PCIe device produces. Currently, BIOS doesn’t populate this data.
			NetworkDeviceFunctions@odata.count	Number	True	An integer representing the number of items in a collection.
			PCIeDevice	Object	True	The value of this property shall be a reference to the resource that this function is a part of and shall reference

						a resource of type PCIeDevice.
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3.69 UpdateService

This is the schema definition for the Update Service and its properties.

3.69.1 GET

3.69.1.1 Request

https://{{ip}}/redfish/v1/UpdateService

Content-Type: application/json

3.69.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 102 UpdateService Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer UpdateService Oem Object Table as given below in Table 104 UpdateService - UpdateInformation. Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier

Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Status	Object	True	Refer Section 3.3 for Resource.Oem. PCIeFunction will take the State & Health values as per the parent PCIeDevice.			
ServiceEnabled	Boolean	False	This indicates whether this service is enabled.			
Actions	Object	True	UpdateService allows the user to perform UpdateService.SimpleUpdate Action. It can also contain an Oem Object under Oem attribute under this Actions. Refer Section 3.75.2			
			Enum	Description		
			UpdateService.BMCFwUpdate	Perform Single/Dual image BMCFwUpdate and HPMFwUpdate Action.		
			UpdateService.UploadFirmwareImage	Upload FirmwareImage.		
			UpdateService.UploadCABundle	Upload CA Bundle.		
FirmwareInventory	Object	True	This property shall contain a link to a Resource of type SoftwareInventoryCollection. Refer			
			Name	Type	Read Only	Description
			@odata.id	String	True	Refer Section 3.1
MaxImageSizeBytes	Integer	False	The maximum size in bytes of the software update image that this Service supports.			
MultipartHttpPushUri	String	False	The URI used to perform a Redfish Specification-defined Multipart HTTP or HTTPS push update to the Update Service. Refer Table 113, Table 114, Table 115, 3.69.3.5			

Table 103 UpdateService Oem Object

Name	Type	Read Only	Description
------	------	-----------	-------------



AMIUpdateService	Object	True	Contains information related to AMI features supported by the Update Service.			
			Name	Type	Read only	Description
			@odata.type	String	True	Refer Section 3.1
			FlashPercentage	String	True	Percentage of flash done
			UpdateStatus	String	True	Stage of UpdateService
			UpdateTarget	String	True	Update Target
			UpdateInformation	Object	True	Update Information Note: please refer Error! Reference source not found.

Table 104 UpdateService - UpdateInformation

Name	Type	Read Only	Description
UpdateComponent	String	True	Component name for Update Information

Table 105 UpdateService SimpleUpdateActionInfo Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Parameters	Object		A parameter associated with the specified Redfish Action.



			Please refer to the Table 106 SimpleUpdateActionInfo Parameters Properties.
--	--	--	---

Table 106 SimpleUpdateActionInfo Parameters Properties

Name	Type	Read Only	Description
Name	String	True	The name of the parameter for this Action.
Required	Boolean	True	Indicates whether the parameter is required to perform this Action.
DataType	String	True	The JSON property type used for this parameter. Allowable Enums are "Boolean, Number, NumberArray, String, StringArray, Object, ObjectArray".
AllowableValues	Array	True	A list of values for this parameter supported by this Action target.

Table 107 UpdateService Actions SimpleUpdate Properties

Name	Type	Read Only	Description	
TransferProtocol	String	False	Enum	Description
			HTTP	HTTP protocol.
			HTTPS	HTTPS protocol Note: It is required to upload the CA bundle for verifying the SSL certificate on server during SSL handshake. Refer 3.69.3.2 and Table 116 UpdateService Actions - UpdateService.UploadCABundle Properties
			FTP	File Transfer Protocol.
ImageURI	String	False	This action is used to update software components.	
User	String	False	User for FTP TransferProtocol.	

Password	String	False	Password for FTP TransferProtocol
----------	--------	-------	-----------------------------------

Table 108 UpdateService - Response Properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section 3.1
Messages	Array	True	This property shall contain an array of messages associated with the settings. Refer Table 133 Slots Properties.

Table 109 UpdateService - BMCFwUpdateActionInfo Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Parameters	Object		A parameter associated with the specified Redfish Action. Please refer to the Table 110 UpdateService - Actions - BMCFwUpdateActionInfo - Parameters Properties.

Table 110 UpdateService - Actions - BMCFwUpdateActionInfo - Parameters Properties

Name	Type	Read Only	Description
Name	String	True	The name of the parameter for this Action.
Required	Boolean	True	Indicates whether the parameter is required to perform this Action.

DataType	String	True	The JSON property type used for this parameter. Allowable Enums are "Boolean, Number, NumberArray, String, StringArray, Object, ObjectArray".
AllowableValues	Array	True	A list of values for this parameter supported by this Action target.

Table 111 UpdateService - Actions - UpdateService.BMCFwUpdate Properties

Name	Type	Read Only	Description	
FlashType	String	False	Enum	Description
			FULLFwUpdate	Perform Single image BMCFwUpdate Action.
			DUALIMAGEFwUpdate	Perform Dual image BMCFwUpdate Action.
			HPMFwUpdate	Perform HPMFwUpdate Action.
UploadSelector	String	False	Enum	Description
			AutoInactive	Updates only the inactive firmware image
			Image1	Updates BMC firmware image1
			Image2	Updates BMC firmware image2.
			ImageBoth	Updates both the firmware images.
			Default	Updates BMC firmware image

Table 112 UpdateService - Actions - UpdateService.UploadFirmwareImage Properties

Name	Type	Read Only	Description	
image_file	String	False	Enum	Description
			image_file path.	Perform Upload Firmware Image Action.

Table 113 UpdateService - Actions MultipartHttpPush Properties

Name	Type	Read Only	Description
UpdateFile	File	False	Image binary for update
UpdateParameters	File	False	DMTF defined standard parameters in json format.Refer Table 114 UpdateService Actions MultipartHttpPush UpdateParameters Properties.
OemParameters	File	False	AMI OEM parameters in json format. Refer Table 115 UpdateService - Actions MultipartHttpPush OemParameters Properties.

Table 114 UpdateService Actions MultipartHttpPush UpdateParameters Properties

Name	Type	Read Only	Description						
Targets	Array	False	<p>An array of URIs that indicate where to apply the update image. If this parameter is not present or contains no targets, the Service shall apply the software image to all applicable targets, as determined by the Service.</p> <p>Note:</p> <p>As each BMC firmware support different component update with different PRJ configuration, it is able to look up the list with GET FirmwareInventory Collection. Refer 3.70</p> <p>If Targets is not present or contains no targets in dual image support BMC and the ImageType is BMC or HPM image contains BMC component, Redfish will update only the inactive firmware image.</p> <table border="1"> <thead> <tr> <th>Enum</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>/redfish/v1/UpdateService/FirmwareInventory/BMC</td> <td>Indicate to update BMC firmware</td> </tr> <tr> <td>/redfish/v1/UpdateService/FirmwareInventory/BMCImage1</td> <td>Indicate to update BMC Image1 for dual image</td> </tr> </tbody> </table>	Enum	Description	/redfish/v1/UpdateService/FirmwareInventory/BMC	Indicate to update BMC firmware	/redfish/v1/UpdateService/FirmwareInventory/BMCImage1	Indicate to update BMC Image1 for dual image
Enum	Description								
/redfish/v1/UpdateService/FirmwareInventory/BMC	Indicate to update BMC firmware								
/redfish/v1/UpdateService/FirmwareInventory/BMCImage1	Indicate to update BMC Image1 for dual image								

			/redfish/v1/UpdateService/FirmwareInventory/BMCImage2	Indicate to update BMC Image2 for dual image
			/redfish/v1/UpdateService/FirmwareInventory/BIOS	Indicate to update BIOS component
			/redfish/v1/UpdateService/FirmwareInventory/ME	Indicate to update ME component
			/redfish/v1/UpdateService/FirmwareInventory/CPLD	Indicate to update CPLD component
			/redfish/v1/UpdateService/FirmwareInventory/MMC	Indicate to update MMC component

Table 115 UpdateService - Actions MultipartHttpPush OemParameters Properties

Name	Type	Read Only	Description	
ImageType	String	False	Enum	Description
			BMC	Indicate uploaded file is a signed BMC image.
			HPM	Indicate uploaded file is an image in HPM format.
			BIOS	Indicate uploaded file is a signed BIOS image.

Table 116 UpdateService Actions - UpdateService.UploadCABundle Properties

Name	Type	Read Only	Description	
ca_bundle	file	False	Enum	Description

			CA bundle path.	Provides CA bundle file in pem format which contains all required RootCA certificates and intermediate certificates for verifying SSL certificate on HTTPS server during SSL handshake.
--	--	--	-----------------	---

3.69.2 PATCH

3.69.2.1 Request

https://{ip}/redfish/v1/UpdateService

Content-Type: application/json

Example PATCH Request Body:

```
{ "ServiceEnabled": true }
```

3.69.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.69.3 POST

3.69.3.1 SimpleUpdate

3.69.3.1.1 Request

The TransferProtocol can be one of the following values: "HTTP", "HTTPS", "FTP".

Note: After SimpleUpdate successfully, it will reset automatically that Redfish will be stopped.

POST https://{ip}/redfish/v1/UpdateService/Actions/SimpleUpdate

Content-Type: application/json

Example POST Request Body:

Anonymous:\

```
{
```

```
  "TransferProtocol": "FTP ", "ImageURI": " ftp://{FTP\_server\_IP}/{image\_name}.ima"
```

```

}
{
  "TransferProtocol": " HTTP", "ImageURI":
  http://{HTTP\_server\_IP}/{image\_name}.ima
}
user account:
{
  "TransferProtocol": " FTP ",
  "ImageURI": "ftp://{FTP_server_IP}/{image_name}.ima",
  "User": "user_account",
  "Password": "user_password"
}

```

Note: The {FTP_server_IP/HTTP_server_IP}/{image_name} must be filled with the FTP/HTTP Server IP and the Image Name, and filled User/Password property for FTP server if necessary, .

3.69.3.1.2 Response

The response status is 202 with the response message (refer Table 108). For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.69.3.2 UploadCABundle

To prevent Man-in-the-middle attack while downloading image with SimpleUpdate Action via HTTPS, https client verifies server certificate with CA Bundle during SSL handshake. CA Bundle is a file contains all trusted certificate(s) of Intermediate CA(s) and RootCA(s).

It is necessary to upload CA Bundle with the UpdateCABundle Action for there is no trusted CA certificate on BMC by default.

3.69.3.2.1 Request

POST <https://{ip}/redfish/v1/UpdateService/>

Actions/Oem/UpdateService.UploadCABundle

Content-Type: multipart/form-data; boundary=-----493918603359346570222237

Note:

Boundary is usually generated by http client and may change for each request.

This URI does not have any Request Body size limit for POST/PATCH/PUT methods.

Example POST Request Body:

-----493918603359346570222237

Content-Disposition: form-data; name=" ca_bundle"; filename="ca.pem"

Content-Type: application/x-x509-ca-cert

<ca bundle content>

-----493918603359346570222237--

3.69.3.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.69.3.3 UploadFirmwareImage

3.69.3.3.1 Request

POST https://{ip}/redfish/v1/UpdateService/Actions/
Oem/UpdateService.UploadFirmwareImage

Content-Type: multipart/form-data; boundary=-----493918603359346570222237

Note: boundary.is usually generated by http client and may change for each request.

Example POST Request Body:

-----493918603359346570222237

Content-Disposition: form-data; name="image_file";
filename="encrypted_rom.ima_enc"

Content-Type: application/octet-stream

<image_binary>

-----493918603359346570222237--

3.69.3.3.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.69.3.4 BMCFwUpdate

3.69.3.4.1 Request

Prerequisites for action BMCFwUpdate : Upload FirmwareImage by POST action UploadFirmwareImage.

The FlashType can be one of the following values: " FULLFwUpdate", " DUALIMAGEFwUpdate", " HPMFwUpdate" and UploadSelector can be one of the following values: " Default ", " AutoInactive ", " Image1 ", " Image2 ", " ImageBoth". (When FlashType are FULLFwUpdate or HPMFwUpdate, UploadSelector need to be Default)

Note: After SimpleUpdate successfully, it will reset automatically that Redfish will be stopped.

POST <https://{{ip}}/redfish/v1/UpdateService/Actions/>

Oem/UpdateService.BMCFwUpdate

Content-Type: application/json

Example POST Request Body:

```
{" FlashType":" FULLFwUpdate","UploadSelector":"Default"}
```

```
{" FlashType":" DUALIMAGEFwUpdate", "UploadSelector":"ImageBoth"}
```

3.69.3.4.2 Response

The response status is 202 with the response message(refer Table 106). For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.69.3.5 MultipartHttpPush

3.69.3.5.1 Request

The request body shell be in the format of multipart/form-data and contain UpdateFile, UpdateParameters and OemParameters metions. Refer Table 113, Table 114, Table 115

The ImageType in OemParamters can be one of the following values: "BMC", "HPM", "BIOS".

The Targets in Parameters should be an array whose element is FirmwareInventory URI or an empty array. Refer Table 114.

Note: After MultipartHttpPush successfully, it will reset automatically that Redfish will be stopped.

POST <https://{{ip}}/redfish/v1/UpdateService/upload>

Content-Type: multipart/form-data; boundary=-----493918603359346570222237

Note: boundary.is usually generated by http client and may change for each request.

Example POST Request Body:

-----493918603359346570222237

Content-Disposition: form-data; name="UploadFile";
filename="encrypted_rom.ima_enc" Content-Type: application/octet-stream

<image_binary>

-----493918603359346570222237

Content-Disposition: form-data; name="UpdateParameters";
filename="parameters.json" Content-Type: application/json

```
{
  "Targets":
  [
    "/redfish/v1/UpdateService/FirmwareInventory/BMC  "
  ]
}
```

-----493918603359346570222237

Content-Disposition: form-data; name="OemParameters";
filename="oem_parameters.json" Content-Type: application/json

```
{
  "ImageType":"BMC"
}
```

-----493918603359346570222237--

3.69.3.5.2 Response

The response status is 202 with the response message(refer Table 76). For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.70 FirmwareInventory Collection

This resource shall be used to represent a collection of firmware inventory.

3.70.1 GET

3.70.1.1 Request

https://{{ip}}/redfish/v1/UpdateService/FirmwareInventory

Content-Type: application/json

3.70.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.71 FirmwareInventory

Chassis resource represents the physical components properties for any system. The non-CPU/device centric parts of the schema are all accessed either directly or indirectly through this resource. This one object is intended to represent racks, rack mount servers, blades, standalone, modular systems, enclosures, and all other containers.

3.71.1 GET

3.71.1.1 Request

https://{{ip}}/redfish/v1/UpdateService/FirmwareInventory/{{firmwareinventory_instance}}

Content-Type: application/json

3.71.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 117 FirmwareInventory Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions ”document.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Updateable	Boolean	True	An indication of whether the Update Service can update this firmware.
Version	String	True	The version of this software. Note:only BMC version supported

3.72 SecureBoot

This resource contains UEFI Secure Boot information. It represents properties for managing the UEFI Secure Boot functionality of a system.

Note: This API will be patchable by Host Interface, (Extra AMI Bios Support is needed)

Important: Please contact with your sales representative for further information on AMI BIOS Image with required modules distribution.

3.72.1 GET

3.72.1.1 Request

`https://{ip}/redfish/v1/Systems/Self/SecureBoot`

Content-Type: application/json

3.72.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 118 SecureBoot Properties

Name	Type	Read Only	Description	
@odata.context	String	True	Refer Section 3.1	
@odata.id	String	True	Refer Section 3.1	
@odata.type	String	True	Refer Section 3.1	
@odata.etag	String	True	Refer Section 3.1	
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document	
Id(M)	String	True	Resource Identifier	
Name(M)	String	True	Name of the Resource	
Description	String	True	Provides description of the resource. Refer Section 3.3	
SecureBootEnable	Boolean	False	Setting this property to true enables UEFI Secure Boot, and setting it to false disables it. This property can be enabled only in UEFI boot mode. Default it will be null value	
Actions	Object	True	This action is used to reset the Secure Boot keys. SecureBoot allows the user to perform SecureBoot. ResetKeys action and it’s allowable values are as given below. It can also contain an Oem Object under Oem attribute under this Actions. Note : Out-Of-Band request for this action will blocked during the Host System Booting until the inventory is processed by the redfish service and the request will respond with status code 503 and Service Not Available message.	
			Enum	Description
			ResetKeys	Reset the content of all UEFI Secure Boot key databases to their default values.

SecureBootCurrentBoot	String	True	The value of this property shall indicate the UEFI Secure Boot state during the current boot cycle.	
			Enum	Description
			Enabled	Secure Boot is currently enabled.
			Disabled	Secure Boot is currently disabled.
SecureBootMode	String	True	Current Secure Boot Mode as defined in the UEFI Specification.	
			Enum	Description
			SetupMode	Secure Boot is currently in Setup Mode.
			UserMode	Secure Boot is currently in User Mode.
			AuditMode	Secure Boot is currently in Audit Mode.
			DeployedMode	Secure Boot is currently in Deployed Mode.

3.72.2 PATCH

3.72.2.1 Request

https://{{ip}}/redfish/v1/Systems/Self/SecureBoot

Content-Type: application/json

Example PATCH Request Body:

```
{ "SecureBootEnable": true }
```

3.72.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

Note : Out-Of-Band PATCH for SecureBoot will be blocked during the Host System Booting until the inventory is processed by the redfish service and the request will respond with status code 503 and Service Not Available message.

Note: The SecureBoot properties will get updated only after booting the system to a third party OS.

3.73 Drives

This is the schema definition for the Drives. It represents the properties of a Drives attached to a System.

Note: Drives resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.73.1 GET

3.73.1.1 Request

`https://{{ip}}/redfish/v1/Systems/Self/Storage/1/Drives/{{Drives_instance}}`

Content-Type: application/json

3.73.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 119 Drives Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object	False	Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document

Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Status	Object	True	Refer Section 3.3 for Resource.Oem.			
Manufacturer	String	True	This is the manufacturer of this Drive			
Model	String	True	This is the model number for the Drive			
SKU	String	True	This is the SKU for this Drive.			
SerialNumber	String	True	The serial number for this Drive.			
PartNumber	String	True	The part number for this Drive			
AssetTag	String	True	The user assigned asset tag for this Drive. Default it will be null value			
Revision	String	True	The revision of this Drive. This is typically the firmware/hardware version of the drive.			
Links	Object	True	The links object contains the links to other resources that are related to this resource.			
			Name	Type	Read Only	Description
			Endpoints	Array	True	An array of references to the endpoints that connect to this drive.
			Endpoints@odata.count	Number	True	An integer representing the number of items in a collection.
			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Chassis	Object	True	A reference to the Chassis which contains this Drive.			

			PCleFunctions	Array	True	An array of references to the PCIe Functions which the drive produces.
			PCleFunctions@odata.count	Number	True	An integer representing the number of items in a collection.
			Volumes	Array	True	An array of references to the volumes contained in this drive. This will reference Volumes that are either wholly or only partly contained by this drive.
			Volumes@odata.count	Number	True	An integer representing the number of items in a collection.
Operations	Object	True	The operations currently running on the Drive.			
			Name	Type	Read Only	Description
			Operation Name	String	True	The name of the operation.
			Percentage Complete	Number	True	The percentage of the operation that has been completed.
			Associated Task	Object	True	A reference to the task associated with the operation if any.
StatusIndicator	String	True	The state of the status indicator, used to communicate status information about this drive.			
			Enum		Description	
			OK		The drive is OK.	
			Fail		The drive has failed.	
			Rebuild		The drive is being rebuilt.	
			PredictiveFailureAnalysis		The drive is still working but predicted to fail soon.	

			Hotspare	The drive is marked to be automatically rebuilt and used as a replacement for a failed drive.
			InACriticalArray	The array that this drive is a part of is degraded.
			InAFailedArray	The array that this drive is a part of is failed.
IndicatorLED	String	True	The state of the indicator LED, used to identify the drive. Default it will be null value	
			Enum	Description
			Lit	The Indicator LED is lit.
			Blinking	The Indicator LED is blinking.
			Off	The Indicator LED is off.
CapacityBytes	Number	True	The size in bytes of this Drive.	
FailurePredicted	Boolean	True	Is this drive currently predicting a failure in the near future.	
PhysicalLocation	Object	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource.Location.	
Protocol	String	True	The protocol this drive is using to communicate to the storage controller.	
			Enum	Description
			PCIe	PCI Express (Vendor Proprietary)
			AHCI	Advanced Host Controller Interface
			UHCI	Universal Host Controller Interface
			SAS	Serial Attached SCSI
			SATA	Serial AT Attachment
			USB	Universal Serial Bus
			NVMe	Non-Volatile Memory Express
			FC	Fibre Channel

			iSCSI	Internet SCSI
			FCoE	Fibre Channel over Ethernet
			NVMeOverFabrics	NVMe over Fabrics
			SMB	Server Message Block (aka CIFS Common Internet File System)
			NFSv3	Network File System version 3
			NFSv4	Network File System version 4
			HTTP	Hypertext Transport Protocol
			HTTPS	Secure Hypertext Transport Protocol
			SFTP	Secure File Transfer Protocol
			FTP	File Transfer Protocol
MediaType	String	True	The type of media contained in this drive.	
			Enum	Description
			HDD	The drive media type is traditional magnetic platters.
			SSD	The drive media type is solid state or flash memory.
			SMR	The drive media type is shingled magnetic recording.
Identifiers	Array	True	Refer for Table 14 Resource.v1_8_1 schema properties Resource.Identifiers.	
EncryptionAb ility	String	True	The encryption abilities of this drive.	
			Enum	Description
			None	The drive is not capable of self encryption.
			SelfEncryptingDrive	The drive is capable of self encryption per the Trusted Computing Group's Self Encrypting Drive Standard.

			Other	The drive is capable of self encryption through some other means.
HotspareType	String	True	The type of hotspare this drive is currently serving as.	
			Enum	Description
			None	The drive is not currently a hotspare.
			Global	The drive is currently serving as a hotspare for all other drives in the storage system.
			Chassis	The drive is currently serving as a hotspare for all other drives in the chassis.
			Dedicated	The drive is currently serving as a hotspare for a user defined set of drives.
EncryptionStatus	String	True	The status of the encryption of this drive.	
			Enum	Description
			Unencrypted	The drive is not currently encrypted. Deprecated: Use Unencrypted.
			Unlocked	The drive is currently encrypted but the data is accessible to the user unencrypted.
			Locked	The drive is currently encrypted and the data is not accessible to the user, however the system has the ability to unlock the drive automatically.
			Unencrypted	The drive is not currently encrypted.
			Foreign	The drive is currently encrypted, the data is not accessible to the user, and the system requires user intervention to expose the data.
RotationSpeedRPM	Number	True	The rotation speed of this Drive in Revolutions per Minute (RPM).	

BlockSizeBytes	Number	True	The size of the smallest addressable unit (Block) of this drive in bytes.	
CapableSpeedGbs	Number	True	The speed which this drive can communicate to a storage controller in ideal conditions in Gigabits per second.	
NegotiatedSpeedGbs	Number	True	The speed which this drive is currently communicating to the storage controller in Gigabits per second.	
PredictedMediaLifeLeftPercent	Number	True	The percentage of reads and writes that are predicted to still be available for the media.	
HotspareReplacementMode	String	True	The replacement mode for the hotspare drive.	
			Enum	Description
			NonRevertible	A hotspare drive that is commissioned due to a drive failure will remain as a data drive and will not revert to a hotspare if the failed drive is replaced.
Revertible	A hotspare drive that is commissioned due to a drive failure will revert to being a hotspare once the failed drive is replaced and rebuilt.			
WriteCacheEnabled	Boolean	True	This property shall indicate whether the drive write cache is enabled.	

3.74 NetworkPort Collection

It displays the collection of NetworkPort resource instances available in the system.

Note: NetworkPortCollection resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.74.1 GET



3.74.1.1 Request

https://{{ip}}/redfish/v1/Chassis/Self/NetworkAdapters/{{NetwrokAdapter_instance}}/
NetworkPorts

Content-Type: application/json

3.74.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.75 NetworkPort

A Network Port represents a discrete physical port capable of connecting to a network.

Note: NetworkPort resource can be populated by Host Interface, (Extra ASUS BIOS Support is needed Refer [section7](#))

3.75.1 GET

3.75.1.1 Request

https://{{ip}}/redfish/v1/Chassis/Self/NetworkAdapters/{{NetwrokAdapter_instance}}/
NetworkPorts/{{NetworkPort_instance}}

Content-Type: application/json

3.75.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

Table 120 Network Port Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1

Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document				
Id(M)	String	True	Resource Identifier				
Name(M)	String	True	Name of the Resource				
Description	String	True	Provides description of the resource. Refer Section 3.3				
Status	Object	True	Refer Section 3.3 for Resource.Oem.				
PhysicalPort Number	String	True	The physical port number label for this port.				
LinkStatus	Object	True	The status of the link between this port and its link partner.				
			Enum	Description			
			Down	The port is enabled but link is down.			
			Up	The port is enabled and link is good (up).			
SupportedLinkCapabilities	Array of Objects	True	This object shall describe the static capabilities of the port, irrespective of transient conditions such as cabling, interface module presence, or remote link partner status or configuration.				
			Name	Type	Read Only	Description	
			LinkNetworkTechnology	String	True	The self-described link network technology capabilities of this port.	
						Enum	Description
						Ethernet	The port is capable of connecting to an Ethernet network.
InfiniBand	The port is capable of connecting to an InfiniBand network.						

						FibreChannel	The port is capable of connecting to a Fibre Channel network.
			CapableLinkSpeedMbps	Number	True	The set of link speed capabilities of this port.	
			AutoSpeedNegotiation	Boolean	True	An indication of whether the port is capable of auto-negotiating speed.	
ActiveLinkTechnology	String	True	Network Port Active Link Technology.				
			Enum			Description	
			Ethernet			The port is capable of connecting to an Ethernet network.	
			InfiniBand			The port is capable of connecting to an InfiniBand network.	
			FibreChannel			The port is capable of connecting to a Fibre Channel network.	
SupportedEthernetCapabilities	String	True	The value of this property shall be an array of zero or more Ethernet capabilities supported by this port.				
			Enum			Description	
			WakeOnLAN			Wake on LAN (WoL) is supported on this port.	
			EEE			IEEE 802.3az Energy Efficient Ethernet (EEE) is supported on this port.	
NetDevFuncMinBWAlloc	Array of Objects	True	The array of minimum bandwidth allocation percentages for the Network Device Functions associated with this port.				
			Name		Type	Read Only	Description
			MinBWAllocPercent		Number	True	The minimum bandwidth allocation percentage allocated to the corresponding network device function instance.

			NetworkDevice Function	Object	True	Contains the members of this collection.
AssociatedNetworkAddresses	Array	True	The array of configured network addresses (MAC or 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.			
EEEEnabled	Boolean	True	Whether IEEE 802.3az Energy Efficient Ethernet (EEE) is enabled for this network port.			
WakeOnLANEnabled	Boolean	True	Whether Wake on LAN (WoL) is enabled for this network port.			
PortMaximumMTU	Number	True	The value of this property shall be the largest maximum transmission unit (MTU) that can be configured for this network port.			
FlowControlStatus	String	True	The value of this property shall be the 802.3x flow control behavior negotiated with the link partner for this network port (Ethernet-only). Enums are same as FlowControlConfiguration given below.			
FlowControlConfiguration	String	True	The value of this property shall be the locally configured 802.3x flow control setting for this network port.			
			Enum	Description		
			None	No IEEE 802.3x flow control is enabled on this port.		
			TX	IEEE 802.3x flow control may be initiated by this station.		
			RX	IEEE 802.3x flow control may be initiated by the link partner.		
			TX_RX	IEEE 802.3x flow control may be initiated by this station or the link partner.		
SignalDetected	Boolean	True	The value of this property shall be a boolean indicating whether the port has detected enough signal on enough lanes to establish link.			
CurrentLinkSpeedMbps	Number	True	The value of this property shall be the current configured link speed of this port.			



FCFabricName	String	True	The FC Fabric Name provided by the switch.	
FCPortConnectionType	String	True	This is the connection type of this port.	
			Enum	Description
			ExtenderFabric	This port connection type is an extender fabric port.
			Generic	This port connection type is a generic fabric port.
			NPort	This port connects via an N-Port to a switch.
			NotConnected	This port is not connected.
			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.
MaxFrameSize	Number	True	The maximum frame size supported by the port.	
NumberDiscoveredRemotePorts	Number	True	The number of ports not on this adapter that this port has discovered.	
VendorId	String	True	The Vendor Identification for this port.	
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.	

3.76 MemoryDomain Collection

It displays a list of Memory instances. This represents the collection of Memory resources.

Note: In BMC, MemoryDomains Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.76.1 GET

3.76.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/MemoryDomains

Content-Type: application/json

3.76.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.77 MemoryDomains

Displays the information about the Memory devices like DIMM supported by the host connected to the BMC.

Note: In BMC, MemoryDomains Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.77.1 GET

3.77.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/MemoryDomains/{{MemoryDomain_instance}}

Content-Type: application/json

3.77.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 121 Memory Domain Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1

Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
AllowsMemoryChunkCreation	Boolean	True	Indicates if this Memory Domain supports the creation of Memory Chunks.			
AllowsBlockProvisioning	Boolean	True	Indicates if this Memory Domain supports the provisioning of blocks of memory.			
InterleavableMemorySets	Array		This is the interleave sets for the memory chunk.			
			Name	Type	Read only	Description
			MemorySet@odata.count	Number	true	Count of MemorySets
			MemorySet	Array of Objects	True	This is the collection of memory for a particular interleave set
MemoryChunks	Object	True	A reference to the collection of Memory Chunks associated with this Memory Domain.			
AllowsMirroring	Boolean	True	Indicates if this Memory Domain supports the creation of Memory Chunks with mirroring enabled.			
AllowsSparing	Boolean	True	Indicates if this Memory Domain supports the creation of Memory Chunks with sparing enabled.			
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			

3.78 MemoryChunks Collection

It displays a list of Memory instances. This represents the collection of Memory resources.



Note: In BMC, MemoryChunks Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.78.1 GET

3.78.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/MemoryDomains/{{MemoryDomain_instance}}/MemoryChunks

Content-Type: application/json

3.78.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.79 MemoryChunks

Displays the information about the Memory devices like DIMM supported by the host connected to the BMC.

Note: In BMC, MemoryChunks Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.79.1 GET

3.79.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/MemoryDomains/{{MemoryDomain_instance}}/MemoryChunks/{{MemoryChunks_instance}}

Content-Type: application/json

3.79.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 122 Memory Chunks Properties

Name	Type	Read Only	Description
------	------	-----------	-------------

@odata.context	String	True	Refer Section 3.1			
@odata.id	String	True	Refer Section 3.1			
@odata.type	String	True	Refer Section 3.1			
@odata.etag	String	True	Refer Section 3.1			
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Status	Object	True	Refer Section 3.3 for Resource.Oem.			
MemoryChunkSizeMiB	Number	True	Size of the memory chunk in MiB.			
AddressRangeType	String	True	Memory type of this memory chunk.			
			Enum	Description		
			Volatile	Volatile memory.		
			PMEM	Byte accessible persistent memory.		
			Block	Block accessible memory.		
InterleaveSets	Array		This is the interleave sets for the memory chunk.			
			Name	Type	Read only	Description
			RegionId	String	True	DIMM region identifier.
			OffsetMiB	Number	True	Offset within the DIMM that corresponds to the start of this memory region, with units in MiB.
			SizeMiB	Number	true	Size of this memory region in MiB.

			MemoryLevel	Number	true	Level of the interleave set for multi-level tiered memory.
			Memory	Objects	true	Ref. to memory device of the interleave set
IsSpare	Boolean	True	Spare enabled status.			
IsMirrorEnabled	Boolean	True	Mirror Enabled status.			
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			

3.80 MemoryMetrics

Displays the information about the Memory devices like NV DIMM supported by the host connected to the BMC.

Note: In BMC, MemoryMetrics Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer Section 10 Redfish Inventory Support for detailed information.

3.80.1 GET

3.80.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/Memory/{{Memory_instance}}/MemoryMetrics

or

<https://{{ip}}/redfish/v1/Systems/Self/MemorySummary/MemoryMetrics>

Content-Type: application/json

3.80.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 123 Memory Metrics Properties



Name	Type	Read Only	Description												
@odata.context	String	True	Refer Section 3.1												
@odata.id	String	True	Refer Section 3.1												
@odata.type	String	True	Refer Section 3.1												
@odata.etag	String	True	Refer Section 3.1												
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document												
Id(M)	String	True	Resource Identifier												
Name(M)	String	True	Name of the Resource												
BlockSizeBytes	Number	True	The block size, in bytes.												
BandwidthPercent	Number	True	memory bandwidth utilization as a percentage												
CurrentPeriod	Object	True	The memory metrics since the last system reset.												
			<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read Only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>BlocksRead</td> <td>Number</td> <td>True</td> <td>The number of blocks read since reset.</td> </tr> <tr> <td>BlocksWritten</td> <td>Number</td> <td>True</td> <td>The number of blocks written since reset.</td> </tr> </tbody> </table>	Name	Type	Read Only	Description	BlocksRead	Number	True	The number of blocks read since reset.	BlocksWritten	Number	True	The number of blocks written since reset.
			Name	Type	Read Only	Description									
			BlocksRead	Number	True	The number of blocks read since reset.									
BlocksWritten	Number	True	The number of blocks written since reset.												
LifeTime	Object	True	The memory metrics since the last system reset.												
			<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read Only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>BlocksRead</td> <td>Number</td> <td>True</td> <td>The number of blocks read for the lifetime of the memory.</td> </tr> <tr> <td>BlocksWrittn</td> <td>Number</td> <td>True</td> <td>The number of blocks written for the lifetime of the memory.</td> </tr> </tbody> </table>	Name	Type	Read Only	Description	BlocksRead	Number	True	The number of blocks read for the lifetime of the memory.	BlocksWrittn	Number	True	The number of blocks written for the lifetime of the memory.
			Name	Type	Read Only	Description									
			BlocksRead	Number	True	The number of blocks read for the lifetime of the memory.									
BlocksWrittn	Number	True	The number of blocks written for the lifetime of the memory.												

HealthData	Object	True	This object shall contain properties which describe the HealthData metrics for the current resource.			
			Name	Type	Read Only	Description
			LastShutdownSuccess	Boolean	True	Status of last shutdown.
			DataLossDetected	Boolean	True	Data loss detection status.
			PerformanceDegraded	Boolean	True	Performance degraded mode status.
			RemainingSpareBlockPercentage	Number	True	The remaining spare blocks, as a percentage.
			AlarmTrips	Object	True	Alarm trip information about the memory. Refer Alarm Trips Table below.
			PredictedMediaLifeLeftPercent	Number	True	The percentage of reads and writes that are predicted to still be available for the media.

Table 124 AlarmTrips

Name	Type	Read Only	Description
Temperature	Boolean	True	Temperature threshold crossing alarm trip detected status.
SpareBlock	Boolean	True	Spare block capacity crossing alarm trip detected status.
AddressParityError	Boolean	True	An indication of whether an address parity error was detected that a retry could not correct.
CorrectableECCError	Boolean	True	An indication of whether a temperature threshold alarm trip was detected.
UncorrectableECCError	Boolean	True	An indication of whether the uncorrectable error threshold alarm trip was detected.



3.81 ActionInfo

The ActionInfo schema describes the parameters and other information necessary to perform a Redfish Action on a particular Action target. Parameter support can differ between vendors and even between instances of a resource.

This data can be used to ensure Action requests from applications contain supported parameters. It is a Redfish Annotation of the form as given below:-

```
"@Redfish.ActionInfo": "/redfish/v1/Managers/Self/LogServices/SEL/ClearlogActionInfo"
```

It comes with all Actions as follows:-

```
"Actions":
  {
    "#LogService.ClearLog":
      {
        "@ Redfish.ActionInfo":
          "/redfish/v1/Managers/Self/LogServices/SEL/ClearlogActionInfo", "target":
            "/redfish/v1/Managers/Self/LogServices/SEL/Actions/LogService.ClearLog"
      }
  }
```

Table 125 ActionInfo Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Id (M)	String	True	Refer Section 3.3
Name (M)	String	True	Refer Section 3.3
Parameters	Object	True	A parameter associated with the specified Redfish Action.

			Please refer to the Table 106 SimpleUpdateActionInfo Parameters Properties.
--	--	--	---

Table 126 ActionInfo - Parameters Properties

Name	Type	Read Only	Description
Name (M)	String	True	The name of the parameter for this Action.
Required	Boolean	True	Indicates whether the parameter is required to perform this Action.
DataType	String	True	The JSON property type used for this parameter. Allowable Enums are "Boolean, Number, NumberArray, String, StringArray, Object, ObjectArray".
ObjectDataType	String	True	This property shall describe the entity type definition (in @odata.type format) for the parameter. This property shall be required for parameters with a DataType of Object or ObjectArray, and shall not be present for parameters with other DataType(s).
AllowableValues	Array	True	A list of values for this parameter supported by this Action target.

3.81.1 Redfish ActionInfo

Table 127 Redfish ActionURLList

Action Name	ActionURI	Parameters		
		Name	DataType	Allowable Values
Chassis.Reset	/redfish/v1/Chassis/Self/ResetActionInfo	ResetType	String	GracefulShutdown, On, ForceRestart, ForceOff
Manager.Reset	/redfish/v1/Managers/Self/ResetActionInfo	ResetType	String	ForceRestart

ComputerSystem.Reset	/redfish/v1/Systems/Self/ResetActionInfo	ResetType	String	GracefulShutdown, On, ForceRestart, ForceOff
LogService.ClearLog - Managers AuditLog	/redfish/v1/Managers/Self/LogServices/AuditLog/ClearlogActionInfo	ClearType	String	ClearAll
LogService.ClearLog - Managers SEL	/redfish/v1/Managers/Self/LogServices/SEL/ClearlogActionInfo	ClearType	String	ClearAll
LogService.ClearLog - Managers EventLog	/redfish/v1/Managers/Self/LogServices/EventLog/ClearlogActionInfo	ClearType	String	ClearAll
LogService.ClearLog - Chassis Logs	/redfish/v1/Chassis/Self/LogServices/Logs/ClearlogActionInfo	ClearType	String	ClearAll
LogService.ClearLog - Systems BIOS	/redfish/v1/Systems/Self/LogServices/BIOS/ClearlogActionInfo	ClearType	String	ClearAll
LogService.ClearLog - Telemetry	/redfish/v1/TelemetryService/LogService/ClearlogActionInfo	ClearType	String	ClearAll
Bios.ResetBios	/redfish/v1/Systems/Self/Bios/ResetBiosActionInfo	ResetBiosType	String	Reset
Bios.ChangePassword	/redfish/v1/Systems/Self/Bios/ChangePasswordActionInfo	NewPassword	String	
		OldPassword	String	
		PasswordName	String	
SecureBoot.ResetKeys	/redfish/v1/Systems/Self/SecureBoot/ResetKeysActionInfo	ResetKeysType	String	ResetAllKeysToDefault, DeletePK, DeleteAllKeys
EventService.SubmitTestEvent	/redfish/v1/EventService/SubmitTestEventActionInfo	EventId	String	
		EventTimestamp	String	



		MessageArgs	Array	
		MessageId	String	
		OriginOfCondition	String	
		Severity	String	
TelemetryService.SubmitTestMetricReport	/redfish/v1/TelemetryService/SubmitTestMetricReportActionInfo	MetricReportName	String	
		GeneratedMetricReportValues	String	
		MetricId	String	
		Metricproperty	String	
		MetricValue	String	
		Timestamp	String	
UpdateService.SimpleUpdate	/redfish/v1/UpdateService/SimpleUpdateActionInfo	ImageURI	String	
		TransferProtocol	String	HTTP,FTP,HTTPS
		User	String	
		Password	String	
EjectMedia	/redfish/v1/Managers/Self/VirtualMedia/CD1/EjectMediaActionInfo	Empty		{}
InsertMedia	/redfish/v1/Managers/Self/VirtualMedia/CD1/InsertMediaActionInfo	Image	string	
		Inserted	boolean	True
		TransferMethod	string	Stream
		TransferProtocolType		NFS
		WriteProtected	boolean	True

3.81.2 AMI OEM ActionInfo

Table 128 Redfish OEM ActionURList

Action Name	ActionURI	Parameters		
		Name	Data Type	Allowable Values
RedfishDBReset	/redfish/v1/Managers/{{manager_instance}}/Oem/RedfishDBResetActionInfo	RedfishDBResetType	String	ResetAll
AmiBios.ChangeState	/redfish/v1/Systems/{{system_instance}}/Memory/{{memory_instance}}ChangeStateActionInfo	State	String	Enable, Disabled
AmiBios.ChangeState	/redfish/v1/Chassis/{{chassis_instance}}/PCleDevices/{{PCleDevice_instance}}ChangeStateActionInfo	State	String	Enable, Disabled
UpdateService.BMCFwUpdate	/redfish/v1/UpdateService/BMCFwUpdateActionInfo	FlashType	String	FULLFwUpdate, DUALIMAGEFwUpdate, HPMFwUpdate
UpdateService.UploadFirmwareImage"	/redfish/v1/UpdateService/UploadFirmwareImageActionInfo	image_file	File	Image path
UpdateService.UploadCABundle	/redfish/v1/UpdateService/UploadCABundleActionInfo	ca_bundle	file	CA bundle path.
VirtualMedia.EnableRMediaActionInfo	/redfish/v1/Managers/Self/Oem/EnableRMediaActionInfo	RMediaState	String	Enable
VirtualMedia.ConfigureCDInstanceActionInfo	/redfish/v1/Managers/Self/Oem/ConfigureCDInstanceActionInfo	CDInstance	String	
UploadLDAPCertificateActionInfo	/redfish/v1/Managers/Self/Oem/LDAPCertificateUploadActionInfo	CACertificateId, CertificateId	Number	1,2

3.82 ProcessorMetrics

ProcessorMetrics contains usage and health statistics for a Processor (all Cores).

Note: In BMC, ProcessorMetrics Inventory will be populated via HostInterface communication with AMI BIOS.

Please refer [Section 10](#) for detailed information.

3.82.1 GET

3.82.1.1 Request

`https://{ip}/redfish/v1/Systems/Self/Processors/{Processors_instance}/ProcessorMetrics`

Content-Type: application/json

3.82.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 129 ProcessorMetrics Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource

Description	String	True	Description of the Resource
AverageFrequencyMHz	Number	True	The average frequency of the processor. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
BandwidthPercent	Number	True	The CPU bandwidth as a percentage.
Cache	Array		The processor cache metrics. Refer Table 130 Cache Properties.
ConsumedPowerWatt	Number	True	The power consumed by the processor.
CoreMetrics	Array		The processor core metrics. Refer Table 131 CoreMetrics Properties.
FrequencyRatio	Number	True	The frequency relative to the nominal processor frequency ratio.
KernelPercent	Number	True	The percentage of time spent in kernel mode.
LocalMemoryBandwidthBytes	Number	True	The local memory bandwidth usage in bytes.
RemoteMemoryBandwidthBytes	Number	True	The remote memory bandwidth usage in bytes.
TemperatureCelsius	Number	True	The temperature of the processor.
ThrottlingCelsius	Number	True	The CPU margin to throttle (temperature offset in degree Celsius).
UserPercent	Number	True	The percentage of time spent in user mode.

Table 130 Cache Properties

Name	Type	Read Only	Description
CacheMiss	Number	True	The number of cache line misses in millions.
CacheMisses PerInstruction	Number	True	The number of cache misses per instruction.
HitRatio	Number	True	The cache line hit ratio.
Level	String	True	The cache level.
OccupancyBytes	Number	True	The total cache level occupancy in bytes.
OccupancyPercent	Number	True	The total cache occupancy percentage.

Table 131 CoreMetrics Properties

Name	Type	Read Only	Description			
CoreCache	Array	True	The cache metrics of this core in the processor. Refer Table 130 Cache Properties.			
CoreId	String	True	The processor core identifier.			
IOStallCount	Number	True	The number of stalled cycles due to I/O operations.			
InstructionsPerCycle	Number	True	The number of instructions per clock cycle of this core.			
MemoryStallCount	Number	True	The number of stalled cycles due to memory operations.			
UnhaltedCycles	Number	True	The unhalted cycles count of this core.			
CStateResidency	Array	True	The C-state residency of this core in the processor.			
			Name	Type	Read only	Description
			Level	String	True	The level of C-state, e.g. C0, C1, C2.



			ResidencyPercent	Number	True	The percentage of time that the processor or core has spent in this particular level of C-state.
--	--	--	------------------	--------	------	--

3.83 PCIeSlots

PCIeSlots contains set of PCIe slot information.

Note: In BMC, PCIeSlots Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.83.1 GET

3.83.1.1 Request

`https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/PCIeSlots`

Content-Type: application/json

3.83.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 132 PCIeSlots Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 .

			Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Description of the Resource
HotPluggable	boolean	True	Indicates whether the PCIe slot supports hotplug.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
Slots	Array		The PCI Slots information. Refer Table 133 Slots Properties

Table 133 Slots Properties

Name	Type	Read Only	Description
Lanes	Number	True	Maximum number of PCIe lanes supported by the slot.
Links	Object		Refer Table 133 Slots Properties
Location	Object		Refer for Table 14 Resource.v1_8_1 schema properties Resource.Location. Note: Northbound is supported and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.

PCleTypes	String	True	PCle Specification supported by this slot.
SlotType	String	True	PCle Slot type for this slot.
Status	Object	True	Refer Section 3.3 for Resource.Oem.

Table 134 Links Properties

Name	Type	Read Only	Description
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
PCleDevice	Array	True	PCle Devices connected in this slot.
PCleDevice@odata.count	Number	True	The number of items in PCleDevices.

3.84 CertificateService

CertificateService describes a Certificate Service that represents the actions available to manage certificates and links to the certificates.

3.84.1 GET

3.84.1.1 Request

GET `https://{{ip}}/redfish/v1/CertificateService`

Content-Type: application/js

3.84.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.



Table 135 CertificateService Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
CertificateLocations	Object	True	This object describes a Resource that an administrator can use in order to locate all certificates installed on a given service.

3.84.2 POST

3.84.2.1 GenerateCSR

3.84.2.1.1 Request

POST `https://{ip}/redfish/v1/CertificateService/Actions/
CertificateService.GenerateCSR`
Content-Type: application/json
Request Body

Table 136 GenerateCSR Request Body

Name	Type	Description
AlternativeNames	String	The additional host names of the component to secure.
CertificateCollection(M)	String	This object will contain the actions for this resource under Oem property if any.
ChallengePassword	String	The challenge password to apply to the certificate for revocation requests.
City(M)	String	The city or locality of the organization making the request.
CommonName(M)	String	The fully qualified domain name of the component to secure.
ContactPerson	String	The name of the user making the request.
Country(M)	String	The two-letter country code of the organization making the request.
Email	String	The email address of the contact within the organization making the request.
GivenName	String	The given name of the user making the request.
Initials	String	The initials of the user making the request.
KeyBitLength	Number	The length of the key, in bits Note : If KeyBitLength is not specific, the default value is 2048.
KeyUsage	Array	The usage of the key contained in the certificate.
Organization(M)	String	The name of the organization making the request.
OrganizationalUnit(M)	String	The name of the unit or division of the organization making the request.
State(M)	String	The state, province, or region of the organization making the request.
Surname	String	The surname of the user making the request.
UnstructuredName	String	The unstructured name of the subject.

Note:

1. The property KeyPairAlgorithm is not supported. Using Default RSA Algorithm(TPM_ALG_RSA) which is the most common used in PKI.
2. The property KeyCurveId which for Elliptic Curve Cryptography Public Key Algorithm(ECC) is not supported.
3. If CertificateCollection is Boot Certificate Collection, then the Oem OwnerGuid property will set one default Guid value from 00000000-0000-0000-0000-000000000000 to 00000000-0000-0000-0000- FFFFFFFF.
4. If CertificateCollection is HTTPS Certificate Collection, then the old certificate instance would be replaced. (There is always only one HTTPS Certificate Instance.)
5. HTTPS Certificate Instance should follow these limitation that based on Lighttpd :
 - a. Max server certificate size is 10240.
 - b. Max server private key size is 10240.
 - c. Min server public key and private key size is 2048.
 - d. Private key should not be encrypted.
 - e. Certificate should not expire.

Example POST Request Body:

```
{  
  "Country": "US",  
  "State": "Oregon",  
  "City": "Portland",  
  "Organization": "Contoso",  
  "OrganizationalUnit": " Service Processors",  
  "CommonName": "manager.contoso.org",  
  "AlternativeNames": [ "manager.contoso.com", "manager.contoso.us" ],  
  "Email": "admin@contoso.org",  
  "KeyBitLength": 512,  
  "KeyUsage": [ "DigitalSignature", "ServerAuthentication" ],  
  "ChallengePassword" : "challengepassword",  
  "GivenName" : "userGivenName",  
  "ContactPerson" : "AMI Manager",  
  "Initials" : "userInitials",  
  "Surname" : "userSurname",  
  "UnstructuredName" : "userUnstructuredName",
```

```
"CertificateCollection" : {"@odata.id" :
"/redfish/v1/Managers/Self/NetworkProtocol/HTTPS/Certificates"}
}
```

3.84.2.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 137 GenerateCSR Response Property

Name	Type	Read Only	Description
CSRString(M)	String	True	The string for the certificate signing request.
CertificateCollection(M)	Object	True	The link to the Certificate Resource Collection where the certificate is installed.
Messages	Array	True	This property shall contain an array of messages associated with the settings. Refer Table 135 CertificateService Property

After successful post call, the new Task will be created and please check the certificate signing result in the corresponding Task. The Messages property will contain the Task information.

3.84.2.2 ReplaceCertificate

3.84.2.2.1 Request

POST <https://{{ip}}/redfish/v1/CertificateService/Actions/CertificateService.ReplaceCertificate>

Content-Type: application/json

Request Body

Table 138 ReplaceCertificate Request Body

Name	Type	Description
CertificateString (M)	String	The string for the certificate. This string should contain the certificate string and private key string
CertificateType (M)	String	The format of the certificate.
CertificateUri(M)	Object	The link to the certificate that is being replaced.

Example POST Request Body:

```
{
  "CertificateString": "-----BEGIN CERTIFICATE-----
\nMIIC2DCCAOICCCQDrKFHkCkpC2zANBgkqhkiG9w0BAQsFADCB8jELMAkGA1UEBh
MC\nVVMxDzANBgNVBAGMBk9yZWdvbjERMA8GA1UEBwwlUG9ydGxhbmQxEDAOb
gNVBAoM\nB0NvbRvc28xDDAKBgNVBAsMA0FCQzEcMBoGA1UEAwwTbWFuYWdl
ci5jb250b3Nv\nLm9yZzEgMB4GCSqGSIb3DQEJARYRYWRtaW5AY29udG9zby5vcmc
xGjAYBgNVBCKM\nEXRlc3RDb250YWN0UGVyc29uMRYwFAYDVQQqDA10ZXN0R2I
2ZW50YW11MRUwEwYD\nVQQRDAx0ZXN0SW5pdGlhbHMxFDASBgNVBAQMC3Rlc3
RTdXJuYW11MB4XDTE5MTIx\nOTAYNTg0NVoxDTIwMDExODAYNTg0NVowgflxCzAJ
BgNVBAYTAIVTMQ8wDQYDVQQI\nnDAZPcmVnb24xETAPBgNVBAcMCFBvcnRsYW5
kMRAwDgYDVQQKDAAdDb250b3NvMQww\nnCgYDVQQQLDANBQkMxHDAaBgNVBAM
ME21hbmFnZXluY29udG9zby5vcmcxIDAeBgkq\nnhkiG9w0BCQEWEFkbWluQGNvb
Rvc28ub3JnMR0wGAYDVQQpDBF0ZXN0Q29udGFj\nndFBIcnNvbG9wEwMBQGA1UEKgw
NdGVzdEdpdmVuTmFtZTEVMBMGA1UEKwwMdGVzdElu\nnaXRpYWxzMRQwEgYDV
QQEDAt0ZXN0U3VybmFtZTBcMA0GCSqGSIb3DQEBAQUAA0sA\nnMEgCQQC2vTAZt
vPrByReb065z6E/n7Rv8ymt4Goowjet6s0kfm/WnJumTt0/eJfk\n2j5c+XSg6q1wgmZOZA
+NZVL7DFUjAgMBAAEwDQYJKoZIhvcNAQELBQADQQCsYyRY\nn3RX7fsLQR0M/LgH
CHF9ke9mF8KsockAQIZLkXuwSZHe6+0b7p6OeWrduiul6cpmO\nnb32QIGFrKWq8JXD+
\n-----END CERTIFICATE-----\n-----BEGIN PRIVATE KEY-----
\nMIIBVgIBADANBgkqhkiG9w0BAQEFAASCAUAWggE8AgEAAkEAtr0wGbbz6wckXm9
O\nuc+hP5+0b/MpreBqKMI3rerNJH5v1pybpbk7dP3iX5No+XPI0oOqtclJmTmQPjWVS\n
+wxVlwlDAQABAkEAn6j0WcNL0f/KTM/KYGLdTdoQ1fFVrH4jtwCleZAJlygClt\nnKcb1A
OsO/jxKFak/ZUUVk5IWomxnZBy641r+AQlhANpX0+K7kUUm4L7x1VgFfRUh\nnal8ns1
MneAkbL0z0j+NjAiEA1kFjSAJlki1fkakXtixdiZz9GdRbgLBFM4cZJXtT\nn00ECIQCNkCld
wBTI7BMNWghD4JMfryGjff8DK/Tkmo6Ja4sbFwlhAKF1FwcNyXh2\nnvt06qsa6uiZY6pbL
Y8UfkJabCUUooevBAiAzw38GApvYqlQeSRQcHTMx/LN6a6NY\nnJlxeaUXwCcsluw==\n
-----END PRIVATE KEY-----\n",
  "CertificateType": "PEM",
  "CertificateUri" : {"@odata.id": "/redfish/v1/Managers/Self/NetworkProtocol/HTTPS/Certifi
cates/1"}
}
```

Note :

1. HTTPS Certificate Instance should follow these limitation that based on Lighttpd :
 - a. Max server certificate size is 10240.
 - b. Max server private key size is 10240.

- c. Min server public key and private key size is 2048.
- d. Private key should not be encrypted.
- e. Certificate should not expire.

3.84.2.2.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.85 CertificateLocations

CertificateLocations describes a Resource that an administrator can use in order to locate all certificates installed on a given service.

3.85.1 GET

3.85.1.1 Request

GET `https://{ip}/redfish/v1/CertificateService/CertificateLocations`

Content-Type: application/json

3.85.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 139 CertificateLocations Property

Name	Type	Read Only	Description
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 .

			Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.			
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Links	Object	True	Contains references to other resources that are related to this resource.			
			Name	Type	Read Only	Description
			Certificates	Array	True	An array of links to the certificates installed on this service.
			Certificates@odata.count	Number	True	An integer representing the number of items in a collection.

3.86 CertificateCollection

CertificateCollection describes a collection of Certificate Resource instances.

3.86.1 GET

3.86.1.1 Request

GET `https://{ip} /redfish/v1/AccountService/Accounts/`

`{ManagerAccountId}/Certificates`

GET `https://{ip} /redfish/v1/Managers/{ManagerId}/`



NetworkProtocol/HTTPS/Certificates

GET https://{ip}/redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates

GET https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/

LDAP/Certificates

GET https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/

LDAP/Certificates/Oem/Ami/ClientCertificates

Content-Type: application/json

Note:

https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates is the collection URI for viewing root CA certificate collection required for LDAP authentication

https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/Oem/Ami/ClientCertificates is the collection URI for viewing client certificate collection required for LDAP authentication

3.86.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.86.2 POST[Createing new Certificate]

3.86.2.1 Request

POST https://{ip}/redfish/v1/AccountService/Accounts/

{ManagerAccountId}/Certificates

POST https://{ip}/redfish/v1/Managers/{ManagerId}/NetworkProtocol/

HTTPS/Certificates

POST https://{ip}/redfish/v1/Systems/{ComputerSystemId}

/Boot/Certificates

POST https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/

LDAP/Certificates

POST https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/

LDAP/Certificates/Oem/Ami/ClientCertificates

Content-Type: application/json

Note:

- Performing POST operation to `https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates` will create/upload root CA certificate required for LDAP authentication.
- Performing POST operation to `https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/Oem/Ami/ClientCertificates` will create/upload root CA certificate required for LDAP authentication. The private key required to upload into BMC will a part of the POST body in this URI.

Request Body

Table 140 CertificateCollection POST Request Property

Name	Type	Description
CertificateString (M)	String	<p>The string for the certificate signing request.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. CertificateString must contain certificate string and private key string. Only support PKCS#1 and PKCS#8 (not encrypted) for private key string. 2. CertificateString should reserve all end-of-line string from certificate file or from private key file, and they should be replaced as \n in request body. 3. CertificateString should concatenate certificate string and private key string with \n, and certificate string should be in front of private key string.
CertificateType (M)	String	<p>The link to the Certificate Resource Collection where the certificate is installed.</p> <p>Note: CertificateType property only supports PEM format.</p>

Example POST Request Body:

```
{
  "CertificateString": "-----BEGIN CERTIFICATE-----
\nMIIC2DCCAoiCCQDrKFHkCkpC2zANBgqhkiG9w0BAQsFADCB8jELMAkGA1UEBhMC\nVV
```




```
MxDzANBgNVBAgMBk9yZWdvdjERMA8GA1UEBwwlUG9ydGxhbmQxEDAOBgNVBAoM\nB0NvbnRvc28xDDAKBgNVBAAsMA0FCQzEcMBoGA1UEAwwTbWVudG9zby5vcmcxGjAYBgNVBCKM\nMB4GCSqGSIb3DQEJARYRYWRtaW5AY29udG9zby5vcmcxGjAYBgNVBCKM\n0YWN0UGVyc29uMRYwFAYDVQQqDA10ZXN0R2l2ZW50YW1IMRUwEwYD\n0SW5pdGlhbHMxFDASBgNVBAQMC3Rlc3RTdXJuYW11MB4XDTE5MTIx\n0MDExODAyNTg0NVowglxGzAJBgNVBAYTAIVTMQ8wDQYDVQQQI\nnDAZPcmVnb24xETAPBgNVBACMFVcnRsYW5kMRAwDgYDVQQKDA\nHDAaBgNVBAMME21hbmFnZXluY29udG9zby5vcmcxIDAeBgkq\nQGNvbnRvc28ub3JnMR0wGAYDVQQqDBF0ZXN0Q29udGFj\nNdGVzdEdpdmVuTmFtZTEVMBMGA1UEKwwMdGVzdElu\nQYJKoZIhvcNAQELBQADQCcsYyRY\nPRIVATE KEY-----\nMIIBVgIBADANBgkqhkiG9w0BAQEFAASCAUAWggE8AgEAAKEAtr0wGbbz6wckXm9O\nP5+0b/MpreBqKMI3rerNJH5v1pybpk7dP3iX5No+XPI0oOqtclJmTmQPjWVS\nkEAN6j0WcNLolF/KTM/KYGLdtdoQ1fVrH4jtwCleZAJlygClt\nmxnZBy641r+AQIhANpX0+K7kUUm4L7x1VgFfRUh\nakXtixdiZz9GdRbgLBFM4cZJXtT\nFwlhAKF1FwcNyXh2\nLN6a6NY\n-----END PRIVATE KEY-----"
```

"CertificateType": PEM"

}

Note :

1. HTTPS Certificate Collection DID NOT support POST operation because Lighttpd only accept one certificate.
2. Maximum allowed size of CertificateString for all Boot Certificate Instance is 20 KB.

3.86.2.2 Response

The response status is 201 and the response body is a GET Response with the properties of the newly created Certificate. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).



3.87 Certificate

Certificate describes a certificate that proves the identify of a component, account, or service.

3.87.1 GET

3.87.1.1 Request

```
GET      https://{ip}/redfish/v1/AccountService/Accounts/
{ManagerAccountId}/Certificates/{CertificateId}
GET      https://{ip}/redfish/v1/Managers/{ManagerId}/
NetworkProtocol/HTTPS/Certificates/{CertificateId}
GET      https://{ip}/redfish/v1/Systems/{ComputerSystemId}/
Boot/Certificates/{CertificateId}
GET      https://{ip}/redfish/v1/Managers/Self/
RemoteAccountService/LDAP/Certificates/1
GET      https://{ip}/redfish/v1/Managers/Self/
RemoteAccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1
```

Content-Type: application/json

Note:

- <https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/1> is the root CA certificate required for LDAP authentication uploaded into BMC
- <https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1> is the client certificate required for LDAP authentication uploaded into BMC
- Since single certificate is maintained in BMC for root ca, or the client certificate required for LDAP authentication, single certificate instance is maintained from Redfish as well.

3.87.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 141 Certificate Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Issuer	Object	True	The issuer of the certificate.
KeyUsage	Array	True	The key usage extension, which defines the purpose of the public keys in this certificate.
Subject	Object	True	The subject of the certificate.
ValidNotAfter	String	True	The date when the certificate is no longer valid.
ValidNotBefore	String	True	The date when the certificate becomes valid.
CertificateString	String	True	This property shall contain the certificate, and the format shall follow the requirements specified by the CertificateType property value.

CertificateType	String	True	The format of the certificate.
-----------------	--------	------	--------------------------------

3.87.2 DELETE

3.87.2.1 Request

```
DELETE https://{ip}/redfish/v1/AccountService/Accounts/
{ManagerAccountId}/Certificates/{CertificateId}
DELETE https://{ip}/redfish/v1/Managers/{ManagerId}/
NetworkProtocol/HTTPS/Certificates/{CertificateId}
DELETE https://{ip}/redfish/v1/Systems/{ComputerSystemId}/
Boot/Certificates/{CertificateId}
DELETE https://{ip}/redfish/v1/Managers/Self/
RemoteAccountService/LDAP/Certificates/1
DELETE https://{ip}/redfish/v1/Managers/Self/
RemoteAccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1
```

Content-Type: application/json

Note:

- HTTPS Certificate Instance DID NOT support DELETE operation because Lighttpd should always have one certificate.
- Default certificates from BIOS (that keys matched Lighttpd keys) should not be deleted from Boot Certificate Instance.
- DELETE operation on `https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/1` and `https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1` cannot be performed when LDAP configuration is saved for SSL and StartTLS. User has to change the LDAP configuration to NoEncryption and can perform DELETE operation to delete, root ca, client certificate and the private key used for LDAP authentication.

3.87.2.2 Response

The response status is 204 and no response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

3.87.3 POST

3.87.3.1 Rekey

Rekey action generates a new key pair for an existing certificate by using the existing certificate data. The response contains a Certificate Signing Request (CSR) that is used to be signed by a Certificate Authority (CA).

3.87.3.1.1 Request

POST https://{ip}/redfish/v1/AccountService/Accounts/

{ManagerAccountId}/Certificates/{CertificateId}/Actions/Certificate.Rekey

POST https://{ip}/redfish/v1/Managers/Self/NetworkProtocol/HTTP/Certificates/{CertificateId}/Actions/Certificate.Rekey

POST https://{ip}/redfish/v1/Systems/Self/Boot/Certificates/{CertificateId}/Actions/Certificate.Rekey

POST https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/1/Actions/Certificate.Rekey

POST https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1/Actions/Certificate.Rekey

Content-Type: application/json

Request Body

Table 142 Rekey Action Request Body Property

Name	Type	Description
ChallengePassword	String	The challenge password to apply to the certificate for revocation requests.
KeyBitLength	Number	The length of the key, in bits Note : If KeyBitLength is not specific, the default value is 2048.

1. If using Rekey action for Boot Certificate Collection, then the Oem OwnerGuid property will set one default Guid value from 00000000-0000-0000-0000-000000000000 to 00000000-0000-0000-0000- FFFFFFFF.
2. HTTPS Certificate Instance should follow these limitation that based on Lighttpd :
 - a. Max server certificate size is 10240.
 - b. Max server private key size is 10240.
 - c. Min server public key and private key size is 2048.
 - d. Private key should not be encrypted.
 - e. Certificate should not expire.

Example POST Request Body:

```
{
  "KeyBitLength": 512,
  "ChallengePassword" : "challengepassword"
}
```

3.87.3.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 143 Rekey Action Response Property

Name	Type	Read Only	Description
CSRString(M)	String	True	The string for the certificate signing request.
Certificate (M)	Object	True	The link to the certificate being rekeyed.
Messages	Array	True	This property shall contain an array of messages associated with the settings. Refer Table 133 Slots Properties.

After successful post call, the new Task will be created and please check the certificate signing result in TaskService. The Messages property will contain the Task information.



3.87.3.2 Renew

3.87.3.2.1 Request

POST <https://{ip}/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}/Actions/Certificate.Renew>

POST <https://{ip}/redfish/v1/Managers/Self/NetworkProtocol/HTTPS/Certificates/{CertificateId}/Actions/Certificate.Renew>

POST <https://{ip}/redfish/v1/Systems/Self/Boot/Certificates/{CertificateId}/Actions/Certificate.Renew>

POST <https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/1/Actions/Certificate.Rekey>

POST <https://{ip}/redfish/v1/Managers/Self/RemoteAccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1/Actions/Certificate.Rekey>

Content-Type: application/json

Request Body

Table 144 Renew Action Request Body Property

Name	Type	Description
ChallengePassword	String	The challenge password to apply to the certificate for revocation requests.

Example POST Request Body:

```
{
  "ChallengePassword" : "challengepassword"
}
```

3.87.3.2.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 145 Renew Action Response Property



Name	Type	Read Only	Description
CSRString(M)	String	True	The string for the certificate signing request.
Certificate (M)	Object	True	The link to the certificate being rekeyed.
Messages	Array	True	This property shall contain an array of messages associated with the settings. Refer Table 133 Slots Properties.

3.88 AccelerationFunctions Collection

Refer [section 7](#) for a detailed information. We need corresponding ASUS BIOS module support for the same.

3.88.1 GET

3.88.1.1 Request

https://{{ip}}/redfish/v1/Systems/Self/Processors/{{Processors_instance}}/
AccelerationFunctions

Content-Type: application/json

3.88.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.89 AccelerationFunction

Note: In BMC, AccelerationFunction Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer [Section 10](#) for detailed information.

3.89.1 GET

3.89.1.1 Request

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/Processors/
{{Processor_instance}}/AccelerationFunctions/{{AccelerationFunction_instance}}

Content-Type: application/json

3.89.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 146 AccelerationFunction Properties

Name	Type	Read Only	Description	
@odata.context	String	True	Refer Section 3.1	
@odata.id	String	True	Refer Section 3.1	
@odata.type	String	True	Refer Section 3.1	
@odata.etag	String	True	Refer Section 3.1	
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document	
Id(M)	String	True	Resource Identifier	
Name(M)	String	True	Name of the Resource	
Description	String	True	Description of the Resource	
AccelerationFunctionType	String	True	The type of acceleration function.	
			Enum	Description
			AudioProcessing	An audio processing function.
			Compression	A compression function.
			Encryption	An encryption function.
			OEM	An OEM-defined acceleration function.
			PacketInspection	A packet inspection function.
			PacketSwitch	A packet switch function.
			Scheduler	A scheduler function.
			VideoProcessing	A video processing function.

Links	Object	True	Name	Type	Read only	Description
			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions ” document.
			Endpoints	Array	True	An array of references to the endpoints that connect to this acceleration function.
			Endpoints@odata.count	Number	True	The number of items in Endpoints.
			PCleFunctions	Array	True	An array of references to the PCleFunctions associated with this acceleration function.
			PCleFunctions@odata.count	Number	True	The number of items in PCleFunctions.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.			
FpgaReconfigurationSlots	Array	True	An array of the reconfiguration slot identifiers for an FPGA.			
Manufacturer	String	True	The acceleration function code manufacturer.			
PowerWatts	Number	True	The acceleration function power consumption.			
UUID	String	True	The universal unique identifier (UUID) for this acceleration function.			
Version	String	True	The acceleration function version.			

Status	Object	True	Refer Section 3.3 for Resource.Oem.
--------	--------	------	---

3.90 Assembly

Note: In BMC, Assembly Inventory will be populated via HostInterface communication with ASUS BIOS. Please refer Section 10 for detailed information.

3.90.1 GET

3.90.1.1 Request

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Assembly
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage/{StorageId}/Assembly
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}/Drives/{{Drive_instance}}/Assembly
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Processors/{{Processor_instance}}/Assembly
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Processors/{{Processor_instance}}/SubProcessors/{{SubProcessor_instance}}/Assembly
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Memory/{{Memory_instance}}/Assembly
https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/Assembly
https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/PCleDevices/{{PCleDevice_instance}}/Assembly

Content-Type: application/json

3.90.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 147 Assembly Properties

Name	Type	Read Only	Description
------	------	-----------	-------------

@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Description of the Resource
Assemblies	Array	True	This is the definition for an assembly information record. Refer Table 147 Assembly Properties.
Assemblies @odata.count	Number	True	The count of Assemblies.

Table 148 Assemblies properties.

Name	Type	Read Only	Description
@odata.id(M)	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Name	String	True	Name of the Resource
Description	String	True	Description of the Resource
MemberId(M)	String	True	This is the identifier for the member within the collection.
BinaryDataURI	String	True	URI that provides the ability to access an image of the assembly information.

EngineeringChangeLevel	String	True	Engineering change level of the Assembly.
Model	String	True	Model number of the Assembly.
PartNumber	String	True	Part number of the Assembly.
PhysicalContext	String	True	Describes the area or device to which this assembly data applies.
Producer	String	True	Producer or manufacturer of the Assembly.
ProductionDate	String	True	Production date of the Assembly.
SKU	String	True	SKU of the Assembly.
SerialNumber	String	True	The serial number of this assembly.
SparePartNumber	String	True	Spare part number of the Assembly.
Status	Object	True	Refer Section 3.3 for Resource.Oem.
Vendor	String	True	Vendor of the Assembly.
Version	String	True	Version of the Assembly.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.

3.91 Redfish.Settings

Redfish settings shall describe any settings of a Resource.

Table 149 Redfish.Settings properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section 3.1
ETag	String	True	The entity tag (ETag) of the Resource to which the settings were applied, after the application. This property shall contain the entity tag (ETag) of the Resource to which the settings were applied, after the application. The client can check this value against the ETag of

			this Resource to determine whether the Resource had other changes.	
Maintenance WindowResource	Object	True	The location of the maintenance window settings. This property shall contain a link to a Resource that contains the @Redfish.MaintenanceWindow property that governs this Resource. This property should be supported if the SupportedApplyTimes property contains AtMaintenanceWindowStart or InMaintenanceWindowOnReset.	
Messages	Array	True	This property shall contain an array of messages associated with the settings. Refer Table 150 Redfish.Settings Messages Properties.	
SettingsObject	Object	True	This property shall contain the URI of the Resource that the client may PUT or PATCH to modify the Resource.	
SupportedApplyTimes	Array	True	The time when the settings can be applied. A service shall advertise its apply time capabilities using this property as to when a Setting resource can be applied.	
			Enum	Description
			Immediate	Apply immediately.
			OnReset	Apply on a reset
			AtMaintenanceWindowStart	Apply during a maintenance window as specified by an administrator.
			InMaintenanceWindowOnReset	Apply after a reset but within maintenance window as specified by an administrator.
Time	String	True	This property shall indicate the time when the settings were applied to the Resource.	

Table 150 Redfish.Settings Messages Properties

Name	Type	Read Only	Description
MessageId	String	True	This property shall be a key into message registry as described in the Redfish specification.



Message	String	True	This property shall contain an optional human readable message.
MessageArgs	Array	True	This property shall contain the message substitution arguments for the specific message referenced by the MessageId and shall only be included if the MessageId is present.
RelatedProperties	Array	True	This property shall contain an array of JSON Pointers indicating the properties described by the message, if appropriate for the message.
Severity	String	True	The value of this property shall be the severity of the error, as defined in the Status section of the Redfish specification.
Resolution	String	True	This property shall contain an override of the Resolution of the message in message registry, if present.
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.

3.92 Sensor Collection

This resource shall represent a resource collection of Sensor instances for a Redfish implementation.

3.92.1 GET

3.92.1.1 Request

`https://{ip}/redfish/v1/Chassis/{chassis_instance}/Sensors`

Content-Type: application/json

3.92.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

3.93 Sensor

This Resource represents a Sensor for a Redfish implementation.

Note: Northbound only support. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.

We added the threshold sensor instances into the /redfish/v1/Chassis/Self/Thermal and /redfish/v1/Chassis/Self/Power Collections before. Now we add the discrete sensor instances into the /redfish/v1/Chassis/Self/Sensors Collection.

Many of the properties in the Sensor schema can't be fetched by the discrete sensors. Here I only added the properties which WEB UI added, like Id, Name, Reading, and Status.State to the Sensor instance.

3.93.1 GET

3.93.1.1 Request

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Sensors/{{sensor_instance}}

Content-Type: application/json

3.93.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 151 Sensor Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Accuracy	Number	True	The estimated percent error of measured versus actual values.
AdjustedMax AllowableOperatingValue	Number, Null	True	The adjusted maximum allowable operating value for this equipment based on the environmental conditions.
AdjustedMin AllowableOperatingValue	Number, Null	True	The adjusted minimum allowable operating value for this equipment based on the environmental conditions.

ApparentVA	Number, Null	True	The product of voltage and current for an AC circuit, in Volt-Amperes units.	
ElectricalContext	String, Null	True	The combination of current-carrying conductors.	
			Enum	Description
			Line1	The circuits that share the L1 current-carrying conductor.
			Line1ToLine2	The circuit formed by L1 and L2 current-carrying conductors when PhaseWiringType.TwoPhase3Wire, TwoPhase4Wire, ThreePhase4Wire, or ThreePhase5Wire.
			Line1ToNeutral	The circuit formed by L1 and Neutral current-carrying conductors when PhaseWiringType.OnePhase3Wire, TwoPhase4Wire, ThreePhase4Wire, or ThreePhase5Wire.
			Line1ToNeutral AndL1L2	The circuits formed by L1, L2, and Neutral current-carrying conductors when PhaseWiringType.TwoPhase4Wire or ThreePhase5Wire.
			Line2	The circuits that share the L2 current-carrying conductor when PhaseWiringType.ThreePhase4Wire, TwoPhase4Wire, or ThreePhase5Wire.
			Line2ToLine3	The circuit formed by L2 and L3 current-carrying conductors when PhaseWiringType.ThreePhase4Wire or ThreePhase5Wire.
			Line2ToNeutral	The circuit formed by L2 and Neutral current-carrying conductors when PhaseWiringType.TwoPhase4Wire or ThreePhase5Wire.
			Line2ToNeutral AndL1L2	The circuits formed by L1, L2, and Neutral current-carrying conductors when PhaseWiringType.

				TwoPhase4Wire or ThreePhase5Wire.
			Line2ToNeutral AndL2L3	The circuits formed by L2, L3, and Neutral current-carrying conductors when PhaseWiringType. ThreePhase5Wire.
			Line3	The circuits that share the L3 current-carrying conductor when PhaseWiringType.ThreePhase4Wire or ThreePhase5Wire.
			Line3ToLine1	The circuit formed by L3 and L1 current-carrying conductors when PhaseWiringType.ThreePhase4Wire or ThreePhase5Wire.
			Line3ToNeutral	The circuit formed by L3 and Neutral current-carrying conductors when PhaseWiringType.ThreePhase5Wire .
			Line3ToNeutral AndL3L1	The circuits formed by L3, L1, and Neutral current-carrying conductors when PhaseWiringType. ThreePhase5Wire.
			LineToLine	The circuit formed by two current-carrying conductors when PhaseWiringType.TwoPhase3Wire, TwoPhase4Wire, ThreePhase4Wire, or ThreePhase5Wire.
			LineToNeutral	The circuit formed by a line and Neutral current-carrying conductor when PhaseWiringType. OnePhase3Wire, TwoPhase4Wire, ThreePhase4Wire, or ThreePhase5Wire.
			Neutral	The grounded current-carrying return circuit of current-carrying conductors when PhaseWiringType. OnePhase3Wire, TwoPhase4Wire, or ThreePhase5Wire.

			Total	The circuits formed by all current-carrying conductors for any PhaseWiringType.
LoadPercent	Number, Null	True	The power load utilization for this sensor.	
Location	Object		The location information for this sensor. For property details, see Location in Table 14 Resource.v1_8_1 schema properties Table 14.	
MaxAllowableOperatingValue	Number, Null	True	The maximum allowable operating value for this equipment.	
MinAllowableOperatingValue	Number, Null	True	The minimum allowable operating value for this equipment.	
PeakReading	Number, Null	True	The peak sensor value.	
PeakReadingTime	String, Null	True	The time when the peak sensor value occurred.	
PhysicalContext	String, Null	True	The area or device to which this sensor measurement applies.	
			Enum	Description
			Accelerator	An accelerator.
			ACInput	An AC input.
			ACMaintenanceBypassInput	An AC maintenance bypass input.
			ACOutput	An AC output.
			ACStaticBypassInput	An AC static bypass input.
			ACUtilityInput	An AC utility input.
			ASIC	An ASIC device, such as a networking chip or chipset component.
			Back	The back of the chassis.

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

			PowerSupplyBay	Within a power supply bay.
			Rectifier	A rectifier device.
			Room	The room.
			StorageBay	Within a storage bay.
			StorageDevice	A storage device.
			SystemBoard	The system board (PCB).
			Transformer	A transformer.
			Upper	The upper portion of the chassis.
			VoltageRegulator	A voltage regulator device.
PhysicalSub Context	String, Null	True	The usage or location within a device to which this sensor measurement applies.	
			Enum	Description
			Input	The input.
			Output	The output.
PowerFactor	Number, Null	True	The power factor for this sensor.	
Precision	Number, Null	True	The number of significant digits in the reading.	
ReactiveVAR	Number, Null	True	The square root of the difference term of squared ApparentVA and squared Power (Reading) for a circuit, in VAR units.	
Reading	Number, Null	True	The sensor value.	
ReadingRange Max	Number, Null	True	The maximum possible value for this sensor.	
ReadingRange Min	Number, Null	True	The minimum possible value for this sensor.	
ReadingType	String, Null	True	The type of sensor.	
			Enum	Description
			AirFlow	Airflow.

			Altitude	Altitude.		
			Barometric	Barometric pressure.		
			Current	Current.		
			EnergyJoules	Energy (Joules).		
			EnergykWh	Energy (kWh).		
			Frequency	Frequency.		
			Humidity	Relative Humidity.		
			LiquidFlow	Liquid flow.		
			LiquidLevel	Liquid level.		
			Power	Power.		
			Pressure	Pressure.		
			Rotational	Rotational.		
			Temperature	Temperature.		
			Voltage	Voltage (AC or DC).		
ReadingUnits	String, Null	True	The units of the reading and thresholds.			
SensingFrequency	Number, Null	True	The time interval between readings of the physical sensor.			
SensorResetTime	String, Null	True	The date and time when the time-based properties were last reset.			
Status	Object		<p>The status and health of the Resource and its subordinate or dependent Resources.</p> <p>For property details, see Status in Table 13 Resource Complex Types.</p>			
Thresholds	Object		The set of thresholds defined for this sensor.			
			Name	Type	Read only	Description
			LowerCaution	Object		The value at which the reading is below normal range.

						Please refer the below Table 152 Threshold Properties table for the sub attributes under this attribute.
			LowerCritical	Object		The value at which the reading is below normal range but not yet fatal. Please refer the below Table 152 Threshold Properties table for the sub attributes under this attribute.
			LowerFatal	Object		The value at which the reading is below normal range and fatal. Please refer the below Table 152 Threshold Properties table for the sub attributes under this attribute.
			UpperCaution	Object		The value at which the reading is above normal range. Please refer the below Table 152 Threshold Properties table for the sub attributes under this attribute.
			UpperCritical	Object		The value at which the reading is above normal range but not yet fatal. Please refer the below Table 152 Threshold Properties table for the sub attributes under this attribute.

			UpperFatal	Object		The value at which the reading is above normal range and fatal. Please refer the below Table 152 Threshold Properties table for the sub attributes under this attribute.
VoltageType	String, Null	True	The voltage type for this sensor.			
			Enum		Description	
			AC		Alternating current.	
			DC		Direct current.	

Table 152 Threshold Properties

Name	Type	Read Only	Description			
Activation	String, Null	True	The direction of crossing that activates this threshold.			
			Enum		Description	
			Decreasing		Value decreases below the threshold.	
			Either		Value crosses the threshold in either direction.	
		Increasing		Value increases above the threshold.		
DwellTime	String, Null	True	The duration the sensor value must violate the threshold before the threshold is activated.			
Reading	Number, Null	True	The threshold value.			

4 Redundancy

This is the schema definition for the Redundancy resource. This is the redundancy definition to be used in other resource schemas.

Note: These properties are configured through redis commands as specified in the Configurable Properties Section in “MegaRAC Redfish - How to Add OEM extensions” document

Table 153 Redundancy Properties

Name	Type	Read Only	Description	
MemberId	String	True	This is the identifier for the member within the collection.	
Name(M)	String	True	Name of the Resource	
Mode(M)	String	True	This is the redundancy mode of the group.	
			Enum	Description
			Failover	Failure of one unit will automatically cause its functions to be taken over by a standby or offline unit in the redundancy set.
			N+m	Multiple units are available and active such that normal operation will continue if one or more units fail.
			Shairng	Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail.
			Sparing	One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.
MaxNumSupported (M)	Number	True	This is the maximum number of members allowable for this particular redundancy group.	
MinNumNeeded(M)	Number	True	This is the minimum number of members needed for this group to be redundant.	

Status (M)	Object	True	Refer Section 3.3 for Resource.Oem. Note: Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.
Redundancy Set(M)	Array	True	Contains any ids that represent components of this redundancy set.
Redundancy Enabled	Boolean	False	This indicates whether redundancy is enabled.

5 HostInterface

The term "Host Interface" refers to interfaces that can be used by software running on a computer system to access the Redfish Service that is used to manage that computer system.

The API's given in this Section can be accessed both through Redfish Ethernet and USB Interfaces and will be available only when Host Interface support is enabled in PRJ.

For a detailed information on Host Interface configuration and verification in Redfish, please refer "MegaRAC Redfish – HostInterface (LanOverUSB)".

Notes:

Important: LAN over USB will work only for SPX-13 RTP 1.8.

The Allow Header values of Outofband interface will be used for Host Interface also. We will not show different allow Headers value in Host Interface.

Important: Host interface support should be enabled in PRJ.

5.1 HostInterface Collection

It displays a collection of Host Interfaces available in Managers

5.1.1 GET

5.1.1.1 Request

https://{{ip}}/redfish/v1/Managers/Self/HostInterfaces

Content-Type: application/json

5.1.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

5.2 HostInterface

In HostInterface specification HostAutoFW & HostAutoOS are the only 2 Accounts allowed for this Interface.

- InterfaceEnabled should be true for HostInterface communication to happen.
- HostAutoFW, HostAutoOS can't be deleted or modified.
- HostAutoFW and HostAutoOS accounts have FirmwareAuthRoleId and KernelAuthRoleId RoleId' s associated with them respectively.
- HostAutoFW and HostAutoOS accounts can be created only when FirmwareAuthEnabled and KernelAuthEnabled are enabled respectively.
- HostAutoFW and HostAutoOS accounts are created by BIOS during boot process and HostAutoFW will be automatically deleted after boot into OS.
- HostAutoFW account is used by BIOS / EFI applications.
- HostAutoOS account is used by OS.

5.2.1 GET

5.2.1.1 Request

https://{{ip}}/redfish/v1/Managers/Self/HostInterfaces/{{hostinterface_instance}}

Content-Type: application/json

5.2.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 154 HostInterface Properties

Name	Type	Read Only	Description
@odata.cont ext	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier

Name(M)	String	True	Name of the Resource	
Description	String	True	Provides description of the resource. Refer Section 3.3	
HostInterface Type	String	True	Enum value: NetworkHostInterface	
Status	Object	True	Refer Section 3.3 for Resource.Oem.	
InterfaceEnabled	Boolean	False	This indicates whether this interface is enabled. Note: "False" value of this property indicates that HostInterface communication is disabled.	
ExternallyAccessible	Boolean	True	This indicates whether this interface is accessible by external entities.	
AuthenticationModes (C)	Array	True	This indicates the authentication modes available on this interface. Note: Configurable under PRJ ONLY.	
			Enum	Description
			AuthNone	Requests without any sort of authentication are allowed. Note : This enum will be populated only when NO_AUTH is selected for HI-AuthMode in PRJ
			BasicAuth	Requests using HTTP Basic Authentication are allowed. Note: Not Supported till Redfish v1.1. This enum will be populated only when BASIC_AUTH is selected for HI-AuthMode in PRJ.
			RedfishSessionAuth	Requests using Redfish Session Authentication are allowed. Note: Not Supported till Redfish v1.1. This enum will be populated only when BASIC_AUTH is selected for HI-AuthMode in PRJ.
OemAuth	Requests using OEM authentication mechanisms are allowed. Note: Not Supported till Redfish v1.7			

KernelAuthRoleId	String	False	<p>This property contains the Role for kernel authentication on this interface.</p> <p>Note: Default value for this RoleId is Administrator and can be patched to any one of the RoleId's "Operator", "ReadOnly" or User defined RoleId's.</p> <p>If the value of this property is ReadOnly then the Privilege of the HI Account (HostAutoOS) will be mapped to the AssignedPrivileges of the ReadOnly Role in AccountService.</p> <p>Refer section 13.4 for Predefined Roles and Privileges.</p>		
KernelAuthEnabled	Boolean	False	<p>This indicates whether this kernel authentication is enabled for this interface.</p> <p>Note: Only if this property is Enabled i.e true, HostAutoOS account can be created.</p>		
FirmwareAuthRoleId	String	False	<p>This property contains the Role for firmware authentication on this interface.</p> <p>Note: Default value for this RoleId is Administrator and can be patched to any one of the RoleId's - "Operator", "ReadOnly" or User defined RoleId's.</p> <p>If the value of this property is ReadOnly then the Privilege of the HI Account (HostAutoFW) will be mapped to the AssignedPrivileges of the ReadOnly Role in AccountService.</p> <p>Refer section 13.4 for Predefined Roles and Privileges.</p>		
FirmwareAuthEnabled	Boolean	False	<p>This indicates whether this firmware authentication is enabled for this interface.</p> <p>Note: Only if this property is Enabled i.e true, HostAutoFW account can be created.</p>		
Links	Object	This is a reference to the network services and their settings that the Manager controls. It is here that clients will find network configuration options as well as network services.			
		Name	Type	Read Only	Description
		ComputerSystems@odata.count	Number	True	An integer representing the number of items in a collection

			ComputerSystems	Array	True	An array of references to the Computer Systems connected to this Host Interface.
			KernelAuthRole	Object	True	A reference to the Role object defining Privileges for this Host Interface when using kernel authentication.
			FirmwareAuthRole	Object	True	A reference to the Role object defining Privileges for this Host Interface when using firmware authentication.
HostEthernetInterfaces	Object	True	This is a reference to a collection of NICs that Computer Systems use for network communication with this Host Interface.			
ManagerEthernetInterface	Object	True	This is a reference to a single NIC that this Manager uses for network communication with this Host Interface.			
NetworkProtocol	Object	True	This is a reference to the network services and their settings that the Manager controls. It is here that clients will find network configuration options as well as network services. Refer Section 3.29 .			
AuthNoneRoleId	String	False	The Role used when no authentication on this interface is used.			

5.2.2 PATCH

5.2.2.1 Request

https://{{ip}}/redfish/v1/Managers/Self/HostInterfaces/{{hostinterface_instance}}

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in HostInterface properties table for which ReadOnly is False that can be sent as Request body in json format.

5.2.2.2 Response

The response status is success by following scenario:



- The response status 200 means success and the response body is a GET Response with the changed values specified in the Patchable properties in Request body
- On error, the response status will be 400 and the body will contain the response error.

For Detailed Error Response Format refer [Section 2.8.2](#) and [Section 2.8.3](#).

5.3 HostEthernetInterface Collection

This resource shall be used to represent the collection of host side Ethernet interfaces.

Note: This URI points to a collection of EthernetInterfaces that Computer Systems use as the Host Interface to this Manager.

5.3.1 GET

5.3.1.1 Request

`https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/HostInterfaces/{{hostinterface_instance}}/HostEthernetInterfaces`

Content-Type: application/json

5.3.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

5.4 Manager EthernetInterface

This resource shall be used to represent the EthernetInterfaces in the manager.

5.4.1 GET –Manager EthernetInterface Instance

5.4.1.1 Request for EthernetInterface Instance

`https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces/usb0`

Content-Type: application/json

Table 155 Manager EthernetInterface usb0 Properties

Name	Type	Read Only	Description												
@odata.context	String	True	Refer Section 3.1												
@odata.id	String	True	Refer Section 3.1												
@odata.type	String	True	Refer Section 3.1												
@odata.etag	String	True	Refer Section 3.1												
Id(M)	String	True	Resource Identifier												
Name(M)	String	True	Name of the Resource												
MACAddress	String	True	<p>The value of this property shall be the effective current MAC Address of this interface. If an assignable MAC address is not supported, this is a read only alias of the PermanentMACAddress</p> <p>Note: Eventhough the ReadOnly attribute in Redfish schema for managers is specified as "False", In Redfish API, patching MACAddress is not allowed. Changing MACAddress will change the IP address and if user is using redfish in remote with no access to host/BMC, it will be an issue in obtaining new IP address and also change in MACAddress could result in mac address collision if there is a device on the local network with the same mac address.</p>												
Ipv4Addresses	Array of Objects	True	This property shall describe an IPv4 address assigned to an interface.												
			<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read Only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Address</td> <td>String</td> <td>False</td> <td>This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only.</td> </tr> <tr> <td>SubnetMask</td> <td>Object</td> <td>False</td> <td>This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only. String</td> </tr> </tbody> </table>	Name	Type	Read Only	Description	Address	String	False	This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only.	SubnetMask	Object	False	This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only. String
			Name	Type	Read Only	Description									
			Address	String	False	This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only.									
SubnetMask	Object	False	This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only. String												
Address	String	False	This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only.												
SubnetMask	Object	False	This is the Ipv4 address. If DHCPv4 is enabled on the interface, this property becomes read-only. String												

						with pattern “^(?:[0-9]{1,3}\.){3}[0-9]{1,3}\$”
Status	Object	True	Refer Section 3.3 for Status under Resource Complex Types.			
InterfaceEnabled	Boolean	False	This indicates whether this interface is enabled.			

5.4.1.2 Response

The response of the request will be in JSON format. Please refer the above Table for the properties.

Note: POST - Manager EthernetInterface Instance is not supported for this instance.

6 Redfish AMI OEM Entities

This section provides the API's that are available as part of AMI OEM Extensions.

Important: AMI OEM Extensions support should be enabled in PRJ.

6.1 Configurations

This gives support for Certificate Authentication(CA) by enabling the user to upload the public certificate to the redfish server. This allows additional configuring of the Redfish service.

6.1.1 GET

6.1.1.1 Request

GET `https://{{ip}}/redfish/v1/configurations`

Content-Type: application/json

Table 156 configuration Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
Id	String	True	Resource Identifier
Name	String	True	Name of the Resource
CertificateAuthorityUrl	String	False	The URL for the web server where the CA certificate is stored.

6.1.1.2 Response

The response of the request will return 200 with response body in JSON format with the OData properties.

6.1.2 PATCH

6.1.2.1 Request

PATCH `https://{ip}/redfish/v1/configurations`

Content-Type: application/json

The request property is same as Get Response "CertificateAuthorityUrl" property.

Example PATCH Request Body

```
{
  "CertificateAuthorityUrl": "https://{ip}/cert/ca-cert.pem"
}
```

In addition user can use custom DHCP option that will send the URL when a lease is given. This is done by adding a custom option to the DHCP server with name "REDFISH_CA_CERTIFICATE", code 248, and value as the URL where the CA certificate can be downloaded.

CertificateAuthorityUrl take priority over the DHCP option, so if a URL is PATCHed, then the URL from the DHCP option will not be used until the CertificateAuthorityUrl field gets PATCHed to null. This operation will look like the below:

PATCH `https://{ip}/redfish/v1/configurations`

Content-Type: application/json

```
{
  "CertificateAuthorityUrl": null
}
```

6.1.2.2 Response

The response status is success by following scenario:

- The response status 200 means success and the response body is a GET Response with the changed values specified in the Patchable properties in Request body
- On error, the response status will be 400 and the body will contain the response error.

For Detailed Error Response Format refer [Section 2.8.2](#) and [Section 2.8.3](#).

6.2 PAM Configuration

6.2.1 GET

6.2.1.1 Request

GET `https://{{ip}}/redfish/v1/AccountService/Configurations`

Content-Type: application/json

Table 157 Account Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Id	String	True	Resource Identifier
Name	String	True	Name of the Resource
PAMEnabled	Boolean	False	Indicates whether or not PAM authentication should be used when authenticating Redfish requests.
PAMOrder	Array	False	Array that represents the order the PAM modules will be checked for authentication. Allowable values are {"ACTIVE DIRECTORY", "RADIUS", "IPMI", "LDAP"}. Note: PAMOrder can change only when PAMEnabled in true state

6.2.1.2 Response

The response of the request will return 200 with response body in JSON format with the OData properties.

6.2.2 PATCH

6.2.2.1 Request

PATCH `https://{{ip}}/redfish/v1/AccountService/Configurations`

Content-Type: application/json

Example PATCH Request Body

```
{
  "PAMEnabled": true,
  "PAMOrder": ["ACTIVE DIRECTORY", "RADIUS", "IPMI", "LDAP"]
}
```

Note:

PAMOrder can change only when PAMEnabled in true.

6.2.2.2 Response

The response status is success by following scenario:

- The response status 200 means success and the response body is a GET Response with the changed values specified in the Patchable properties in Request body
- A message will be included in the response when the lighttpd web server needs to be restarted

On error, the response status will be 400 and the body will contain the response error.

For Detailed Error Response Format refer [Section 2.8.2](#) and [Section 2.8.3](#).

6.3 Memory Action

State of any Memory instance can be changed by this API. DIMM's can be either enabled or disabled.

Note:

This Action will be reflected in Actual hardware only when ASUS BIOS with DRE is used.

This feature needs Host Interface support & AMI OEM Extension Support in ASUS BMC and ASUS BIOS with corresponding modules.

6.3.1 POST

6.3.1.1 Request

```
POST https://{{ip}}/redfish/v1/Systems/Self/Memory/
{{Memory_instance}}/Actions/AmiBios.ChangeState
```

Content-Type: application/json

Example POST Request Body

```
{
  "State": "Disabled"
}
```

6.3.1.2 *Response*

The response of the request will be 204 No content.

6.4 PCIeFunctions Instance Action

State of any PCIeDevice instance can be changed by this API.

Note:

This Action will be reflected in Actual hardware only when ASUS BIOS with DRE is used.

This feature needs Host Interface support & AMI OEM Extension Support in ASUS BMC and ASUS BIOS with corresponding modules.

6.4.1 POST

6.4.1.1 *Request*

```
POST https://{ip}/redfish/v1/Chassis/Self/PCIeDevices/
{{PCIeDevices_instance}}/PCIeFunctions/
{{PCIeFunctions_instance}}Actions/AmiBios.ChangeState
```

Content-Type: application/json

Example POST Request Body

```
{
  "State": "Disabled"
}
```

6.4.1.2 *Response*

The response of the request will be 204 No content.

6.5 Manager RedfishDB Reset

The RedfishDBReset action in Redfish will clear the Redfish database, repopulate it with default values using db_init and then repopulate data from IPMI to Redfish.

Note:

On a successful “RedfishDBReset” action, the db_init will repopulate the default values of several modules like Action-Info, AccountService, TelemetryService, TaskService, EventService, CompositionService etc.

And the properties of modules like VirtualMedia, NetworkProtocol, LDAP, SEL LogServices, SerialInterfaces will be repopulated with the values synced with IPMI.

6.5.1 POST

6.5.1.1 Request

```
POST https://{ip}/redfish/v1/Managers/Self/Actions/
Oem/AMIManager.RedfishDBReset
```

Content-Type: application/json

Example POST Request Body

```
{
  "RedfishDBResetType": "ResetAll"
}
```

6.5.1.2 Response

The response of the request will be 202 with below content.

```
{
  "@odata.context":
  "/redfish/v1/$metadata#Task.Task(TaskState,Description,Name,Id)",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_2.Task",
  "Description": "Task for RedfishDBReset Task",
  "Id": "1",
  "Name": "RedfishDBReset Task",
  "TaskState": "New"
}
```



```
}

```

Note: This URI is used for debugging purpose (DEBUG ONLY FEATURE). System inventories like processor, memory etc provided by BIOS will be cleared from database and needs host reboot for BIOS to populate data again. Using TaskId Can check the TaskStatus.

6.6 Manager ConfigureCDInstance Action

This ConfigureCDInstance action is used to configure the number of CD/DVD devices that are to be supported for Virtual Media redirection. If it is set to 0, no CD instances will be displayed under Virtualmedia collection. The default value of CD instance is 1. The CDInstance values ranges from zero to four.

Note:

This feature is not supported in SPX-13.0 RTP 1.8 release as VirtualMedia is not enabled.

The POST action is not allowed when any one of the CD / HD media redirection is in progress. Redirection can be initiated through WebUI / Redfish/ KVM.

6.6.1 POST

6.6.1.1 Request

```
POST https://{ip}/redfish/v1/Managers/Self/Actions/Oem/AMIVirtualMedia.ConfigureCDInstance
```

```
Content-Type: application/json
```

Example POST Request Body

```
{
  "CDInstance": "4"
}
```

6.6.1.2 Response

The response status code should be 200 with the below message in the response.

```
{
  "@Message.ExtendedInfo":
  [
    {
```

```

"@odata.type": "#Message.v1_0_8.Message",
"Message": " ConfigureCDInstance action has been initiated successfully.
Please allow upto 4-5 secs and verify the value of CDInstances OEM
property in /redfish/v1/Managers/Self instance",
"MessageArgs":
[
    "ConfigureCDInstance",
    "CDInstances OEM",
    "/redfish/v1/Managers/Self"
],
"MessageId": "Ami.1.0.DelayInActionCompletion",
"Resolution": "Check the property value update after 4-5 seconds",
"Severity": "OK"
}
]
}

```

Note: When the CD instance is modified through Redfish, it will also be reflected in Web UI

6.7 Manager EnableRMedia Action

CD Media collection will be displayed under VirtualMedia only when RMedia support is enabled. This EnableRMedia action is used to Enable/Disable RMedia support.

Note :

This feature is not supported in SPX-13.0 RTP 1.8 release as VirtualMedia is not enabled.

The POST action is not allowed when any one of the CD / HD media redirection is in progress. Redirection can be initiated through WebUI / Redfish/ KVM.

6.7.1 POST

6.7.1.1 Request

```

POST      https://{ip} /redfish/v1/Managers/Self/
          Actions/Oem//AMIVirtualMedia.EnableRMedia
Content-Type: application/json

```

Example POST Request Body

```
{
  "RMediaState": "Enable"
}
```

6.7.1.2 Response

The response status code should be 200 with the below message in the response.

```
{
  "@Message.ExtendedInfo":
  [
    {
      "@odata.type": "#Message.v1_0_8.Message",
      "Message": "EnableRMedia action has been initiated successfully. Please
allow upto 4-5 secs and verify the value of RMediaStatus OEM property in
/redfish/v1/Managers/Self instance",
      "MessageArgs":
      [
        "EnableRMedia",
        "RMediaStatus OEM",
        "/redfish/v1/Managers/Self"
      ],
      "MessageId": "Ami.1.0.DelayInActionCompletion",
      "Resolution": "Check the property value update after 4-5 seconds",
      "Severity": "OK"
    }
  ]
}
```

6.8 Managers OEM Properties

6.8.1 GET

6.8.1.1 Request

GET <https://{{ip}}/redfish/v1/Managers/Self>

Content-Type: application/json

Table 158 Managers Self O EM properties

Name	Type	Read Only	Description			
RADIUS	Object	True	Name	Type	Read only	Description
			@odata.id	String	True	Refer Section 3.1
VirtualMedia	Object	True	Name	Type	Read only	Description
			@odata.type	String	True	Refer Section 3.1
			CDInstances	String	True	Specifies the number of CD instances allowed for redirection
			RMediaStatus	String	True	Specifies the current status of RMedia settings

6.8.1.2 Response

The response of the request will return 200 with response body in JSON format with the OData properties.

6.9 InventoryData Status URI

This URI is used to see the status of BIOS inventory file processing. This URI will only be available in server root, once inventory file is posted.

6.9.1 GET

6.9.1.1 Request

GET <https://{{ip}}/redfish/v1/Oem/Ami/InventoryData/Status>

Content-Type: application/json



6.9.1.2 Response

The response of the request will be 200 OK with response body.

Table 159 InventoryData Status properties

Name	Type	Read Only	Description																							
@odata.context	String	True	Refer Section 3.1																							
@odata.id	String	True	Refer Section 3.1																							
@odata.type	String	True	Refer Section 3.1																							
@odata.etag	String	True	Refer Section 3.1																							
Id	String	True	Resource Identifier																							
Name	String	True	Name of the Resource																							
Description	String	True	Provides description of the resource. Refer Section 3.3																							
InventoryData	Object	True	<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>DeletedModules</td> <td>Array</td> <td>True</td> <td>This is an array CrcElementes that have been updated in this Inventory population. Refer Allowed values for DeletedModules Table.</td> </tr> <tr> <td>Messages</td> <td>Array</td> <td>True</td> <td>This is an array messages that is created during Inventory population.</td> </tr> <tr> <td>ProcessingTime</td> <td>Number</td> <td>True</td> <td>This is the time taken to process and populate the Inventory file.</td> </tr> <tr> <td>Status</td> <td>String</td> <td>True</td> <td>Specifies the status of inventory file processing.</td> </tr> </tbody> </table>				Name	Type	Read only	Description	DeletedModules	Array	True	This is an array CrcElementes that have been updated in this Inventory population. Refer Allowed values for DeletedModules Table.	Messages	Array	True	This is an array messages that is created during Inventory population.	ProcessingTime	Number	True	This is the time taken to process and populate the Inventory file.	Status	String	True	Specifies the status of inventory file processing.
			Name	Type	Read only	Description																				
			DeletedModules	Array	True	This is an array CrcElementes that have been updated in this Inventory population. Refer Allowed values for DeletedModules Table.																				
			Messages	Array	True	This is an array messages that is created during Inventory population.																				
			ProcessingTime	Number	True	This is the time taken to process and populate the Inventory file.																				
Status	String	True	Specifies the status of inventory file processing.																							

Table 160 Allowed values for DeletedModules

Enum	Description
CPU	This element corresponds to all data related to Processor, like Processors and ProcessorsMetrics.
DIMM	This element corresponds to all data related to Memory, like Memory, MemoryDomains, MemoryChunks and MemoryMetrics
PCIE	This element corresponds to all data related to Storage, PCleDevices, NetworkInterfaces, NetworkAdapters.

Table 161 Enum values for Status

Enum	Description
Ready	This signifies that Inventory file processing is completed.
Queued	This signifies that Inventory processing task is queued in SouthBound.
In-Progress	This signifies that Inventory file is being processed in background.
Failed	This signifies that Inventory file processing failed.
Completed	This signifies that Inventory file processing is completed.

6.10 AccountService LDAP OEM Properties

6.10.1 GET

6.10.1.1 Request

GET <https://{{ip}}/redfish/v1/AccountService>

Content-Type: application/json

Table 162 Account Service LDAP OEM Properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section 3.1
EncryptionType	String	False	Indicates the EncryptionType used for UsernameandPassword encryption. Allowable Enums are:- “NoEncryption”, “SSL”, “StartTLS”.

CommonNameType	String	False	It represents the Server name. It contains 2 allowable values : "IPAddress", "FQDN". Note: FQDN can be patched only when the EncryptionType is "StartTLS".
----------------	--------	-------	---

6.10.1.2 Response

The response of the request will return 200 with response body in JSON format with the OData properties.

6.10.2 PATCH

6.10.2.1 Request

PATCH `https://{ip}/redfish/v1/AccountService`

Content-Type: application/json

Example PATCH Request Body - NoEncryption

```
{
  "LDAP":
  {
    "Authentication":
    {
      "Username": "cn=admin,dc=coretesting,dc=com",
      "Password": "ubuntu",
      "Oem":
      {
        "Ami":
        {
          "EncryptionType": "NoEncryption",

          "CommonNameType": "IPAddress"
        }
      }
    }
  },
}
```

```

"LDAPService":
{
  "SearchSettings":
  {
    "BaseDistinguishedNames": ["dc=coretesting,dc=com"],
    "GroupsAttribute": "cn"
  }
},
"ServiceAddresses": [ "10.0.122.61:389" ],
"ServiceEnabled": true
}
}

```

Example PATCH Request Body - StartTLS

```

{
  "LDAP":
  {
    "Authentication":
    {
      "Username": "cn=admin,dc=coretesting,dc=com",
      "Password": "ubuntu",
      "Oem":
      {
        "Ami":
        {
          "EncryptionType": "StartTLS",
          "CommonNameType": "FQDN"
        }
      }
    }
  },
}

```



```

"LDAPService":
{
  "SearchSettings":
  {
    "BaseDistinguishedNames": [ "dc=coretesting,dc=com" ],
    "GroupsAttribute": "cn"
  }
},
"ServiceAddresses": [ "10.0.122.61:389" ],
"ServiceEnabled": true
}
}

```

6.11 AccountService ActiveDirectory OEM Properties

6.11.1 GET

6.11.1.1 Request

GET https://{ip}/redfish/v1/AccountService

Content-Type: application/json

Table 163 Account Service Active Directory OEM Properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section 3.1
DomainName	String	False	Specify the Domain Name for the user
DomainControllerServerAddress1	String	False	IP address of Active Directory server. At least one Domain Controller Server Address must be configured. The following address formats are supported: IPv4 Address format. IPv6 Address format.

DomainControllerServerAddress2	String	False	IP address of Active Directory server. At least one Domain Controller Server Address must be configured. The following address formats are supported: IPv4 Address format. IPv6 Address format.
DomainControllerServerAddress3	String	False	IP address of Active Directory server. At least one Domain Controller Server Address must be configured. The following address formats are supported: IPv4 Address format. IPv6 Address format.
GroupID	String	False	GroupID of the five available roles in RoleMapping
KVMAccess	String	False	Status of KVM access of the particular role in RoleMapping
VMediaAccess	String	False	Status of VMedia access of the particular role in RoleMapping

6.11.1.2 Response

The response of the request will return 200 with response body in JSON format with the OData properties.

6.11.2 PATCH

6.11.2.1 Request

PATCH <https://{{ip}}/redfish/v1/AccountService>

Content-Type: application/json

Example PATCH Request Body - NoEncryption

```
{
```



```

"ActiveDirectory":
{
  "Authentication":
  {
    "Username": "AD1", "Password": "AD@123", "Oem":
    {
      "Ami":
      {
        "DomainName": "abc123.com",
        "DomainControllerServerAddr1" : "10.0.1.23"
      }
    }
  },
  "ServiceEnabled":false
}
}

```

Example PATCH Request Body - RoleMapping

```

{
  "ActiveDirectory": { "RemoteRoleMapping":
  [
    {
      "LocalRole": "Administrator", "RemoteGroup": "redfish4", "RemoteUser":
      "Active2", "Oem":
      {
        "Ami":
        {
          "GroupID":2,
          "KVMAccess": "Enable",
          "VMediaAccess": "Enable"
        }
      }
    }
  ]
}

```

```
    }  
  }  
} ]  
} }  
}
```

7 Telemetry

7.1 TelemetryService

This resource shall be used to represent a Metrics Service for a Redfish implementation. It represents the properties for the service itself and has links to collections of metric definitions and metric report definitions.

Table 164 Telemetry Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document.
Id(M)	String	True	Resource Identifier
MetricDefinitions	Array	True	A collection of Metric definitions that describes metrics properties. The entries shall be resources of type MetricDefinitionCollection.
MetricReportDefinitions	Array	True	A collection of MetricReportDefinitions. The value shall be a link to a resource of type MetricReportDefinitionCollection.
MetricReports	Array	True	A collection of MetricReport resources, that relate to MetricReportDefinition.
Triggers	Array	True	A collection of triggers, which apply to metrics. The value shall be a link to a resource of type TriggersCollection. Note: Not allowed to create more than 25 triggers. Restricted internally.
Status	Object	True	Refer Section 3.3 for Resource.Status.

Name	String	True	Name of the Collection
MaxReports	Number	True	The maximum number of MetricReports that are supported by this service. If present, the value shall specify the maximum number of metric collectors that can be supported by this service. Limited to 25 .
MinCollection Interval	String	True	The minimum supported interval between collections. If present, the value shall be an ISO 8601 duration specifying the minimum time between collections. Limited to PT5S.
SupportedCollectionFunctions	Array	False	Function to perform over each sample. If present, the value shall define the function to apply over the collection duration. [Minimum, Summation, Average and Maximum are the supported collection functions]
Actions	Object	True	The Actions object contains the available custom actions on this resource like SubmitTestMetricReport or any Oem Action.
LogService	Object	True	This is a reference to a Log Service used by the Telemetry Service. The value of this property shall contain a reference to a LogService for the use by this Telemetry Service.

7.1.1 GET

7.1.1.1 Request

<https://{{ip}}/redfish/v1/TelemetryService>

Content-Type: application/json

7.1.1.2 Response

Please refer the sample response below.

```
{
  "@odata.context": "/redfish/v1/$metadata#TelemetryService.TelemetryService",
  "@odata.etag": "\"1581328430\"",
  "@odata.id": "/redfish/v1/TelemetryService",
  "@odata.type": "#TelemetryService.v1_1_1.TelemetryService",
  "Actions":
  {
    "#TelemetryService.SubmitTestMetricReport":
```

```

    {
      "@Redfish.ActionInfo":
        "/redfish/v1/TelemetryService/SubmitTestMetricReportActionInfo",
      "target":
        "/redfish/v1/TelemetryService/Actions/TelemetryService.SubmitTestMetric
        Report"
    }
  },
  "Description": "TelemetryService",
  "Id": "TelemetryService",
  "LogService":
  {
    "@odata.id": "/redfish/v1/TelemetryService/LogService"
  },
  "MaxReports": 25,
  "MetricDefinitions":
  {
    "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions"
  },
  "MetricReportDefinitions":
  {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions"
  },
  "MetricReports":
  {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReports"
  },
  "MinCollectionInterval": "PT5S",
  "Name": "TelemetryService",
  "Status":
  {

```

```

        "Health": "OK",
        "State": "Enabled"
    },
    "SupportedCollectionFunctions":
    [
        "Summation",
        "Minimum",
        "Maximum",
        "Average"
    ],
    "SupportedCollectionFunctions@Redfish.AllowableValues":
    [
        "Average",
        "Maximum",
        "Summation",
        "Minimum"
    ],
    "Triggers":
    {
        "@odata.id": "/redfish/v1/TelemetryService/Triggers"
    }
}

```

7.1.2 POST

The TelemetryService resource has an Action related URI under the “Actions” attribute named TelemetryService.SubmitTestMetricReport. This Action URI shall cause the event service to immediately generate the metric report, as an Alert Event. This message should then be sent to any appropriate event destinations.

However, no metric report instances will be added under the MetricReports URI “/redfish/v1/TelemetryService/MetricReports” and no logs will be generated under LogServices

URI "/redfish/v1/TelemetryService/LogServices/MetricReportLog/Entries". For the allowed attributes in the POST Request Body under the URI, refer the below mentioned table.

Table 165 Post Service Properties

Name	Type	Read Only	Description			
MetricReportName	String	False	The Name property of the metric report in generated metric report. This parameter shall be the value of the Name property in the generated metric report.			
GeneratedMetricReportValues	Array	False	This parameter shall contain the contents of the MetricReportValues array property in the generated metric report.			
			Name	Type	Read only	Description
			MetricId	String	False	The metric definitions identifier for this metric.
			MetricProperty	String	False	The URI for the property from which this metric is derived. The value shall be URI to the a property following the JSON fragment notation, as defined by RFC6901, to identify an individual property in a Redfish resource.
			MetricValue	String	False	The value of the metric represented as a string.
			Timestamp	String	False	The time when the value of the metric is obtained. A management application may establish a time series of metric data by retrieving the instances of metric value and sorting them according to their Timestamp.

7.1.2.1 Request

https://{{ip}}/redfish/v1/TelemetryService/Actions/
TelemetryService.SubmitTestMetricReport

Content-Type: application/json

Example POST Request Body :

```
{
  "MetricReportName": "Average2", "GeneratedMetricReportValues":
  [
    {
      "MetricId": "Temp_average_reading_Average",
      "MetricProperty":
      "/redfish/v1/Chassis/Self/Thermal#/Temperatures/39/ReadingCelsius",
      "MetricValue": "23",
      "Timestamp": "2019-07-01T06:05:52Z"
    }
  ]
}
```

7.1.2.2 Response

The response status is 204 with no response body. For Error Responses refer Section [Section 2.8.2](#) and [Section 2.8.3](#).

7.1.3 PATCH

7.1.3.1 Request

https://{{ip}}/redfish/v1/TelemetryService

Content-Type: application/json

```
{
  "SupportedCollectionFunctions":
  [
```

```

        "Maximum", "Minimum", "Summation"
    ]
}

```

7.1.3.2 Response

The response status is success with status code as 204 and no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

7.2 Metric Definition Collection

Redfish represents metrics as resource properties (sensor readings, statistics). Metric Definitions are the metadata of the metrics and provides details about characteristics of readings and calculation for statistics.

It displays a collection of Metric Definitions.

7.2.1 GET

7.2.1.1 Request

`https://{ip}/redfish/v1/TelemetryService/MetricDefinitions`

Content-Type: application/json

7.2.1.2 Response

Please refer the sample response below.

```

{
  "@odata.context":
  "/redfish/v1/$metadata#MetricDefinitionCollection.MetricDefinitionCollection",
  "@odata.etag": "W/1527512499\"",
  "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions",
  "@odata.type": "#MetricDefinitionCollection.MetricDefinitionCollection",
  "Members":
  [
    {

```

```

        "@odata.id":
        "/redfish/v1/TelemetryService/MetricDefinitions/Fan_Reading"
    },
    {
        "@odata.id":
        "/redfish/v1/TelemetryService/MetricDefinitions/Voltage_Reading"
    },
    {
        "@odata.id":
        "/redfish/v1/TelemetryService/MetricDefinitions/Temperature_Reading"
    }
],
"Members@odata.count": 3,
"Name": "MetricDefinitions"
}

```

7.3 Metric Definition Instance

Metric Definitions are the metadata of the metrics and provides details about characteristics of readings and calculation for statistics.

The following properties are supported for Metric Definition:

Table 166 Metric Definition Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1



Id (M)	String	True	This property represents an identifier for the resource. All values for resources described by this schema shall comply to the requirements as described in the Redfish specification.
Name	String	True	This object represents the Name property. All values for resources described by this schema shall comply to the requirements as described in the Redfish specification.
MetricDataType	String	True	The data type of the related metric values. The property provides information to the client on the nature of the metric reading. The value shall be the data type of the related metric values as defined by JSON data types.
MetricType	String	True	Only "Numeric" is supported. The value of the metric shall be a real number with a float format.
Implementation	String	True	"Physical" for sensors and "Calculated" for metrics The value of this property shall designate how the sensor is implemented.
Units	String	True	Units of measure for this metric.
IsLinear	Boolean	True	The value shall specify that the corresponding metric values shall be linear or non-linear.
MetricProperties	Array	True	A collection of URI for the properties on which this metric definition is defined. Note : Each value under "MetricProperties" attribute depicts either a Temperature/Fan/Voltage Sensor and each of them is represented as a combination of its Sensor Number and Owner LUN Number. For e.g., If a Fan Sensor has Sensor Number as 48 and LUN Number as 0, then it will be displayed under the MetricProperties attribute as a combination of its Sensor Number and Owner LUN Number as mentioned below: /redfish/v1/Chassis/Self/Thermal#/Fans/48_0/ReadingRPM
Precision	Number	True	The value of the property shall specify the number of significant digits in the MetricValue. A value shall not be present if MetricType is Discrete. Default value is 3.

Accuracy	Number	True	<p>The value of the property shall be the percent error +/- of the measured vs. actual values. A value shall not be present if MetricType is Discrete.</p> <p>Default value is 5 .</p>
Calculable	String	True	<p>The value of the property shall specify the types of calculations which can be applied to the metric reading. This property provides information to the client on the suitability of calculation using the metric reading.</p> <p>NonCalculatable: No calculations should be performed on the metric reading.</p> <p>NonSummable: The sum of the metric reading across multiple instances is not meaningful.</p> <p>Summable: The sum of the metric reading across multiple instances is meaningful.</p> <p>Note : North Bound Support only available.</p>
CalculationAlgorithm	String	True	<p>The value of this property shall specify the calculation performed to obtain the metric. The time interval referred here shall be the value of the CalculationTimeInterval property.</p> <p>Average: The metric shall be calculated as the average of a metric reading over a sliding time interval.</p> <p>Maximum: The metric shall be calculated as the maximum of a metric reading over a sliding time interval.</p> <p>Minimum: The metric shall be calculated as the minimum of a metric reading over a sliding time interval.</p> <p>Note : North Bound Support only available.</p>
CalculationTimeInterval	String	True	<p>The value of this property shall specify the time interval over the metric calculation is performed. The format of the value shall conform to the Duration format.</p> <p>Note : North Bound Support only available.</p>
PhysicalContext	String	True	<p>The value of this property shall specify the physical context of the metric.</p> <p>Note : North Bound Support only available.</p>

7.3.1 GET

7.3.1.1 Request

https://{{ip}}/redfish/v1/TelemetryService/MetricDefinitions/Fan_Reading

Content-Type: application/json

7.3.1.2 Response

Please refer the sample response below

```
{
  "@odata.context": "/redfish/v1/$metadata#MetricDefinition.MetricDefinitions",
  "@odata.etag": "\"1581501930\"",
  "@odata.id": "/redfish/v1/TelemetryService/MetricDefinitions/Fan_Reading",
  "@odata.type": "#MetricDefinition.v1_0_2.MetricDefinition",
  "Accuracy": 5,
  "Id": "Fan_Reading",
  "Implementation": "PhysicalSensor",
  "IsLinear": true,
  "MetricDataType": "Integer", "MetricProperties":
  [
    "/redfish/v1/Chassis/Self/Thermal#/Fans/48_0/ReadingRPM",
    "/redfish/v1/Chassis/Self/Thermal#/Fans/58_0/ReadingRPM",
    "/redfish/v1/Chassis/Self/Thermal#/Fans/54_0/ReadingRPM",
    "/redfish/v1/Chassis/Self/Thermal#/Fans/50_0/ReadingRPM",
    "/redfish/v1/Chassis/Self/Thermal#/Fans/56_0/ReadingRPM",
    "/redfish/v1/Chassis/Self/Thermal#/Fans/52_0/ReadingRPM"
  ],
  "MetricType": "Numeric",
  "Name": "Fan Reading",
  "Precision": 3,
  "Units": "RPM"
}
```

7.4 Metric Report Definition Collection

This resource specifies a set of metrics that shall be collected into a metric report.

It displays a collection of Metric Report Definitions.

7.4.1 GET

7.4.1.1 Request

`https://{{ip}}/redfish/v1/TelemetryService/MetricReportDefinitions`

Content-Type: application/json

7.4.1.2 Response

Please refer the sample response below.

```
{
  "@odata.context":
  "/redfish/v1/$metadata#MetricReportDefinitionCollection.MetricReportDefinitionColl
  ection",
  "@odata.etag": "\"1581503501\"",
  "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions",
  "@odata.type":
  "#MetricReportDefinitionCollection.MetricReportDefinitionCollection",
  "Members":
  [
    {
      "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/
      AverageTemperatureReport"
    },
    {
      "@odata.id": "/redfish/v1/TelemetryService/
      MetricReportDefinitions/TemperatureReport"
    }
  ],
  "Members@odata.count": 2,
  "Name": "MetricReportDefinitions"
```


}

7.4.2 POST

The following properties are mandatory to create a Metric Report Definition:

- Id
- Name
- Schedule.RecurrenceInterval
- MetricReport
- MetricReportDefinitionType
- MetricProperties or Metrics

Note:

Status->State and Status-Health are read-only attributes and cannot be passed in the POST Request Body.

Only a maximum of 25 MetricReportDefinitions can be created.

MaxReports Limit is 25(i.e. Maximum Number of MetricReportDefinitions that can be created by issuing POST Request is 25(considered internally) and Maximum number of Metric Reports that is generated internally is also 25).

Consider the following scenario. Suppose a MetricReportDefinition is created with "SuppressRepeatedMetric" = false and "ReportUpdates" = "NewReport" and 'RecurrenceInterval' = 'PT20S'. In this case, new Metric Report shall be generated every 20 seconds. After a certain duration, the count of Metric Reports will definitely reach the MaxReports Limit(i.e. 25). Once the count of Metric Reports reaches the MaxReports Limit, no further Metric Reports will be generated until the user deletes any or all of the existing Metric Reports. Also, a Log Entry will be added under Telemetry Log Service indicating that Count of MetricReports has reached the MaxReports Limit and that no further Metric Reports will be generated until the user deletes any or all of the existing Metric Reports.

When a request is issued to create a MetricReportDefinition, the following conditions come into the picture:

- MetricReportDefinition gets created if neither the count of MetricReports nor the count of MetricReportDefinitions has reached the MaxReports Limit.
- Throw "CreateLimitReachedForResource" error if the count of MetricReportDefinitions has reached the MaxReports Limit.
- Throw "CreateLimitReachedForMetricReportsResource" error if the count of MetricReports has reached the MaxReports Limit.

7.4.2.1 Request with MetricProperties

https://{ip}/redfish/v1/TelemetryService/MetricReportDefinitions

Content-Type: application/json

```
{
  "Id": "TemperatureReport",
  "Name": "Temperature_Report",
  "Schedule":
  {
    "RecurrenceInterval": "PT20S"
  },
  "MetricReportDefinitionType": "Periodic",
  "MetricReport":
  {
    "@odata.id":
    "/redfish/v1/TelemetryService/MetricReports/TemperatureReport"
  },
  "MetricProperties":
  [
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/
    116_0/ReadingCelsius",
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/
    117_0/ReadingCelsius"
  ]
}
```

7.4.2.2 Response

HTTP/1.1 201 Created

Location:

https://<IP>/redfish/v1/TelemetryService/MetricReportDefinitions/TemperatureReport

```
{
  "@odata.context":
  "/redfish/v1/$metadata#MetricReportDefinition.MetricReportDefinition(ReportUpdat
```

```

es, MetricReportDefinitionEnabled, Id, Status, Name, MetricProperties, ReportActions,
MetricReportDefinitionType, MetricReport, Schedule)",
"@odata.etag": "\"1581503147\"",
"@odata.id":
"/redfish/v1/TelemetryService/MetricReportDefinitions/TemperatureReport",
"@odata.type": "#MetricReportDefinition.v1_2_0.MetricReportDefinition",
"Id": "TemperatureReport",
"MetricProperties":
[
  "/redfish/v1/Chassis/Self/Thermal#/Temperatures/117_0/ReadingCelsius",
  "/redfish/v1/Chassis/Self/Thermal#/Temperatures/116_0/ReadingCelsius"
],
"MetricReport":
{
  "@odata.id": "/redfish/v1/TelemetryService/MetricReports/TemperatureReport"
},
"MetricReportDefinitionEnabled": true,
"MetricReportDefinitionType": "Periodic",
"Name": "Temperature_Report",
"ReportActions":
[
  "LogToMetricReportsCollection"
],
"ReportUpdates": "Overwrite",
"Schedule":
{
  "RecurrenceInterval": "PT 20S"
},
"Status":
{
  "Health": "OK",

```

```

        "State": "Enabled"
    }
}

```

7.4.2.3 Request with Metrics

```

{
    "Id": "AverageTemperatureReport",
    "Name": "Average_Temperature_Report",
    "Schedule":
    {
        "RecurrenceInterval": "PT40S"
    },
    "MetricReportDefinitionType": "Periodic",
    "MetricReport":
    {
        "@odata.id":
        "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
    },
    "Metrics":
    [
        {
            "MetricId": "AverageTemperature",
            "CollectionTimeScope": "Interval",
            "MetricProperties":
            [
                "/redfish/v1/Chassis/Self/Thermal#/Temperatures/
                117_0/ReadingCelsius",
                "/redfish/v1/Chassis/Self/Thermal#/Temperatures/
                116_0/ReadingCelsius"
            ],
            "CollectionDuration": "PT40S",

```

```

        "CollectionFunction": "Average"
    }
]
}

```

7.4.2.4 Response

HTTP/1.1 201 Created

Location:

https://<IP>/redfish/v1/TelemetryService/MetricReportDefinitions/
AverageTemperatureReport

```

{
  "@odata.context":
  "/redfish/v1/$metadata#MetricReportDefinition.MetricReportDefinition(ReportUpdates,MetricReportDefinitionEnabled,Id,Status,Name,ReportActions,MetricReportDefinitionType,MetricReport,Schedule,Metrics)",
  "@odata.etag": "\"1581503501\"",
  "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport",
  "@odata.type": "#MetricReportDefinition.v1_2_0.MetricReportDefinition",
  "Id": "AverageTemperatureReport",
  "MetricReport":
  {
    "@odata.id":
    "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
  },
  "MetricReportDefinitionEnabled": true,
  "MetricReportDefinitionType": "Periodic",
  "Metrics":
  [
    {
      "CollectionDuration": "PT40S",
      "CollectionFunction": "Average",

```

```
    "CollectionTimeScope": "Interval",
    "MetricId": "AverageTemperature",
    "MetricProperties":
    [
        "/redfish/v1/Chassis/Self/Thermal#/Temperatures/116_0/ReadingCelsius",
        "/redfish/v1/Chassis/Self/Thermal#/Temperatures/117_0/ReadingCelsius"
    ]
    }
],
"Name": "Average_Temperature_Report",
"ReportActions":
[
    "LogToMetricReportsCollection"
],
"ReportUpdates": "Overwrite",
"Schedule":
{
    "RecurrenceInterval": "PT40S"
},
"Status":
{
    "Health": "OK",
    "State": "Enabled"
}
}
```

7.4.2.5 Request with MetricReportHeartbeatInterval, SuppressRepeatedMetricValue and MetricReportDefinitionEnabled

```

{
  "Id": "AverageTemperatureReport",
  "Name": "Average_Temperature_Report",
  "Schedule": {
    "RecurrenceInterval": "PT20S"
  },
  "MetricReportDefinitionType": "Periodic",
  "SuppressRepeatedMetricValue" : true,
  "MetricReportDefinitionEnabled" : true,
  "MetricReportHeartbeatInterval" : "PT30S",
  "MetricReport": {
    "@odata.id":
"/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
  },
  "Metrics": [
    {
      "MetricId": "AverageTemperature",
      "CollectionTimeScope": "Interval",
      "MetricProperties": [
        "/redfish/v1/Chassis/Self/Thermal#/Temperatures/117_0/ReadingCelsius",
        "/redfish/v1/Chassis/Self/Thermal#/Temperatures/116_0/ReadingCelsius"
      ],
      "CollectionDuration": "PT20S",
      "CollectionFunction": "Average"
    }
  ]
}

```

7.4.2.6 Response

HTTP/1.1 201 Created

Location:

https://<IP>/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport

```
{
  "@odata.context":
  "/redfish/v1/$metadata#MetricReportDefinition.MetricReportDefinition(ReportUpdates,
  MetricReportDefinitionEnabled,Id,Status,Name,SuppressRepeatedMetricValue,Metric
  ReportDefinitionType,MetricReport,Metrics,MetricReportHeartbeatInterval,Schedule,ReportActions)",
  "@odata.etag": "\"1583757340\"",
  "@odata.id":
  "/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport",
  "@odata.type": "#MetricReportDefinition.v1_2_0.MetricReportDefinition",
  "Id": "AverageTemperatureReport",
  "MetricReport":
  {
    "@odata.id":
    "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
  },
  "MetricReportDefinitionEnabled": true,
  "MetricReportDefinitionType": "Periodic",
  "MetricReportHeartbeatInterval": "PT30S",
  "Metrics":
  [
    {
      "CollectionDuration": "PT20S",
      "CollectionFunction": "Average",
      "CollectionTimeScope": "Interval",
      "MetricId": "AverageTemperature",

```



```

    "MetricProperties":
    [
        "/redfish/v1/Chassis/Self/Thermal#/Temperatures/116_0/ReadingCelsius",
        "/redfish/v1/Chassis/Self/Thermal#/Temperatures/117_0/ReadingCelsius"
    ]
    }
],
"Name": "Average_Temperature_Report",
"ReportActions":
[
    "LogToMetricReportsCollection"
],
"ReportUpdates": "Overwrite",
"Schedule":
{
    "RecurrenceInterval": "PT20S"
},
"Status":
{
    "Health": "OK",
    "State": "Enabled"
},
"SuppressRepeatedMetricValue": true
}

```

7.5 Metric Report Definition Instance

The Metric Report Definition resource specifies the metric report that the Redfish service will create. The Metric Reports are updated periodically based on the recurrence interval specified.

The following properties are supported for Metric Report Definition:

Table 167 Metric Report Definition Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Id (M)	String	True	This property represents an identifier for the resource. All values for resources described by this schema shall comply to the requirements as described in the Redfish specification.
Name	String	True	This object represents the Name property. All values for resources described by this schema shall comply to the requirements as described in the Redfish specification.
Schedule	Object	True	Only RecurrenceInterval is supported currently. If present, A metric values collected starting at each scheduled interval and for the time specified by Duration. No more than Schedule.MaxOccurrences values shall be collected for this metric. If not present, the corresponding metric values shall be collected when the related metric report is retrieved.
MetricReportDefinitionType	String	True	Only Periodic is supported currently. The value shall specify when the corresponding metric values are collected by the underlying instrumentation. If not present, the GatheringType is not known.
Status	Object	True	Refer Section 3.3 for Resource.Status.
MetricProperties	Array	True	This property shall list the metric properties to include in the metric report. Note: If this attribute is present, Metrics attribute should not be present. MetricProperties only support the value defined under the reading of /redfish/v1/TelemetryService/MetricDefinitions.
MetricReport	Object	True	The value of this property shall be a reference to the resource where the resultant metric report is placed.

MetricReportDefinitionEnabled	Boolean	False	<p>The value of this property shall be a boolean indicating whether this MetricReportDefinition is enabled for generating new MetricReports.</p> <p>Note: Default value for “MetricReportDefinitionEnabled” attribute is true.</p>
SuppressRepeatedMetricValue	Boolean	False	<p>The value of this property shall indicate whether suppression of Metric information has been enabled or not.</p> <p>A value of true indicates that any Metric in the MetricReport currently be generated will be suppressed and not included in the MetricReport when the value of the Metric equals the value of the same Metric in the previously generated MetricReport.</p> <p>A value of false means that the suppression mechanism is not applied to the MetricReport being generated.</p> <p>A MetricReport may be generated with no MetricProperty array values if all Metrics had the same values as in the previously generated MetricReport. This scenario is applicable only when attribute “ReportUpdates” has a value NewReport”</p> <p>Note: Default value for “SuppressRepeatedMetricValue” attribute is true.</p>
MetricReportHeartbeatInterval	String	False	<p>This property specifies an interval to send complete MetricReport regardless of whether values have changed. It is used in addition to the RecurrenceInterval where SuppressRepeatedMetricValue is Enabled and the Redfish client desired to be refreshed with metric data occasionally regardless of whether the data is changed or not.</p> <p>The property value shall be a Redfish Duration describing the time interval between generation of the unsuppressed MetricReport. It shall always be a value greater than the RecurrenceInterval of a MetricReport and should only be applicable when the SuppressRepeatedMetricValue property is Enabled.</p> <p>The value of this attribute shall be a Redfish Duration in the below mentioned format :</p> <p>"-?P(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?"</p> <p>Note: There is no default value for “MetricReportHeartbeatInterval” attribute.</p>

ReportTimespan	String	False	<p>This property shall specify the timespan duration that this metric report covers. The value of ReportTimespan attribute shall be a Redfish Duration in the below mentioned format :</p> <p>"-?P(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)?"</p> <p>This property specifies the amount of time, MetricReports will be generated for a MetricReportDefinition. If the value for this property is specified during the creation of the MetricReportDefinition, the service will stop creating MetricReport once the specified amount of time has reached from the creation of MetricReportDefinition. If the user modifies this attribute at a later period of time, then the ReportTimespan will be measured from the point of time the PATCH request was issued.</p> <p>Note: There is no default value for "ReportTimespan" attribute.</p> <p>This property will not update the value of MetricReportDefinitionEnabled or Status</p>
AppendLimit	Integer	True	<p>This property shall contain a number that indicates the maximum number of entries that can be appended to a metric report. When the metric report reaches its limit, its behavior shall be dictated by the ReportUpdates property. This property shall be required if ReportUpdates is either AppendWrapsWhenFull or AppendStopsWhenFull.</p> <p>Note: By default, this limit is configured to 50. It cannot be modified or passed in the request body to POST MetricReportDefinitions.</p>
ReportActions	Array	True	<p>This property specifies the set of actions to perform when a metric report is generated and should be any one of the enum values - LogToMetricReportsCollection , RedfishEvent.</p> <p>Note: By default this property will have the value LogToMetricReportCollection.</p> <p>Also MetricReportDefinitions and MetricReports updation or generation will not add any log entries inside MetricReportLogs.</p> <p>"ReportUpdates" attribute will not be supported if "RedfishActions" attribute has a value of "RedfishEvent" alone. In order for "ReportUpdates" attribute to be supported, "RedfishActions" attribute must have the value</p>

			"LogToMetricreportsCollection" with/without the value "RedfishEvent".			
ReportUpdates	String	True	<p>This property shall contain how subsequent metric reports are handled in relationship to an existing metric report created from the metric report definition. It specifies whether to overwrite, append, or create a report Resource. The allowable values for this property are - Overwrite, AppendWrapsWhenFull, AppendStopsWhenFull, NewReport.</p> <p>Note: This property can have the value NewReport only if the ReportActions property array has LogToMetricReportsCollection as its member. Also the default value for this property is Overwrite.</p>			
Links	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource.			
			Name	Type	Read only	Description
			Oem	Object		<p>Refer Resource Complex Types under Section 3.3.</p> <p>Note: It will be present in response if there is an oem property implemented according to "How to Add OEM extensions" document</p>
			Triggers	Array	True	The value shall be a set of references to triggers that will cause this metric report definition to generate a new metric report upon a trigger occurrence when the TriggerActions property contains the value RedfishMetricReport.
			Triggers@odata.count	Integer	True	An integer representing the number of items in a collection.
Metrics	Object	True	A collection of metrics specifying the CollectionFunction and the MetricProperties to apply these functions.			



			Note: If this attribute is present, MetricProperties attribute should not be present.												
			<table border="1"> <thead> <tr> <th>Properties</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>MetricId</td> <td>Id of the metric</td> </tr> <tr> <td>CollectionDuration</td> <td>Time interval</td> </tr> <tr> <td>CollectionFunction</td> <td>Minimum, Maximum, Average or Summation</td> </tr> <tr> <td>CollectionTimeScope</td> <td>Only Interval is supported. The time scope of the corresponding metric values. If not present, the time scope was not qualified by the metric designer, or is unknown to the provider.</td> </tr> <tr> <td>MetricProperties</td> <td>A collection of URI for the metric properties to include in the metric report. Note: MetricProperties only support the values defined under the Members of MetricDefinitions URI /redfish/v1/TelemetryService/MetricDefinitions.</td> </tr> </tbody> </table>	Properties	Description	MetricId	Id of the metric	CollectionDuration	Time interval	CollectionFunction	Minimum, Maximum, Average or Summation	CollectionTimeScope	Only Interval is supported. The time scope of the corresponding metric values. If not present, the time scope was not qualified by the metric designer, or is unknown to the provider.	MetricProperties	A collection of URI for the metric properties to include in the metric report. Note: MetricProperties only support the values defined under the Members of MetricDefinitions URI /redfish/v1/TelemetryService/MetricDefinitions.
Properties	Description														
MetricId	Id of the metric														
CollectionDuration	Time interval														
CollectionFunction	Minimum, Maximum, Average or Summation														
CollectionTimeScope	Only Interval is supported. The time scope of the corresponding metric values. If not present, the time scope was not qualified by the metric designer, or is unknown to the provider.														
MetricProperties	A collection of URI for the metric properties to include in the metric report. Note: MetricProperties only support the values defined under the Members of MetricDefinitions URI /redfish/v1/TelemetryService/MetricDefinitions.														

7.5.1 GET

7.5.1.1 Request

https://{{ip}}/redfish/v1/TelemetryService/MetricReportDefinitions/
AverageTemperatureReport

Content-Type: application/json

7.5.1.2 Response

Please refer the sample response below.

```
{
  "@odata.context":
  "/redfish/v1/$metadata#MetricReportDefinition.MetricReportDefinition(ReportUpdat
```



```

es, MetricReportDefinitionEnabled, Id, Status, Name, ReportActions, MetricReportDefinition
Type, MetricReport, Schedule, Metrics)",
"@odata.etag": "\"1581503942\"",
"@odata.id":
"/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport"
,
"@odata.type": "#MetricReportDefinition.v1_2_0.MetricReportDefinition",
"Id": "AverageTemperatureReport",
"MetricReport":
{
  "@odata.id":
  "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
},
"MetricReportDefinitionEnabled": true,
"MetricReportDefinitionType": "Periodic",
"Metrics":
[
  {
    "CollectionDuration": "PT40S",
    "CollectionFunction": "Average", "CollectionTimeScope": "Interval",
    "MetricId": "AverageTemperature",
    "MetricProperties":
    [
      "/redfish/v1/Chassis/Self/Thermal#/Temperatures/116_0/
      ReadingCelsius",
      "/redfish/v1/Chassis/Self/Thermal#/Temperatures/117_0/
      ReadingCelsius"
    ]
  }
],
"Name": "Average_Temperature_Report",
"ReportActions":

```

```

    [
      "LogToMetricReportsCollection"
    ],
    "ReportUpdates": "Overwrite",
    "Schedule":
    {
      "RecurrenceInterval": "PT40S"
    },
    "Status":
    {
      "Health": "OK",
      "State": "Enabled"
    }
  }
}

```

7.5.2 DELETE

The DELETE operation is used to delete a particular Metric Report Definition Instance. When a Metric Report Definition Instance is deleted, the corresponding Metric Report Instance is also deleted.

7.5.2.1 Request

```

https://{ip}/redfish/v1/TelemetryService/MetricReportDefinitions/
AverageTemperatureReport

```

Content-Type: application/json

7.5.2.2 Response

HTTP/1.1 204 No Content

7.5.3 PATCH

7.5.3.1 Request

```

PATCH https://{ip}/redfish/v1/TelemetryService/
MetricReportDefinitions/AverageTemperatureReport

```


Content-Type: application/json

Request Body

The properties mentioned in the below table are patchable and can be sent in the Request Body in JSON Format.

Table 168 Metric Report Definition Instance Patch Properties

Name	Type	Read Only	Description
MetricReportDefinitionEnabled	Boolean	False	The value of this property shall be a boolean indicating whether this MetricReportDefinition is enabled for generating new MetricReports.
SuppressRepeatedMetricValue	Boolean	False	<p>The value of this property shall indicate whether suppression of Metric information has been enabled or not.</p> <p>A value of true indicates that any Metric in the MetricReport currently be generated will be suppressed and not included in the MetricReport when the value of the Metric equals the value of the same Metric in the previously generated MetricReport.</p> <p>A value of false means that the suppression mechanism is not applied to the MetricReport being generated.</p> <p>A MetricReport may be generated with no MetricProperty array values if all Metrics had the same values as in the previously generated MetricReport. This scenario is applicable only when attribute "ReportUpdates" has a value "NewReport"</p>
MetricReportHeartbeatInterval	String	False	<p>This property specifies an interval to send complete MetricReport regardless of whether values have changed. It is used in addition to the ReccurranceInterval where SuppressRepeatedMetricValue is Enabled and the Redfish client desired to be refreshed with metric data occasionally regardless of whether the data is changed or not.</p> <p>The property value shall be a Redfish Duration describing the time internal between generation of the unsuppressed MetricReport.</p> <p>It shall always be a value greater than the ReccurranceInterval of a MetricReport and should only be applicable when the SuppressRepeatedMetricValue property is Enabled.</p>

Example PATCH Request Body:

```
{
  "MetricReportDefinitionEnabled":true,
  "SuppressRepeatedMetricValue":true,
  "MetricReportHeartbeatInterval":PT45S"
}
```

7.5.3.2 Response

HTTP/1.1 204 No Content

The below mentioned scenarios are taken into consideration while generating Metric Reports 1. If value of attribute RecurrenceInterval is specified(say PT[x]S) and SuppressRepeatedMetricValue attribute has a value of "false", then the suppression mechanism is not applied to the MetricReport being generated and every PT[x]S , the MetricReport will be generated for all the MetricProperties.

- A MetricReport may be generated with no MetricProperty array values if all Metrics had the same values as in the previously generated MetricReport. This scenario is applicable only when attribute "ReportUpdates" has a value "NewReport".
- If value of attribute RecurrenceInterval is specified(say PT[x]S) and SuppressRepeatedMetricValue attribute has a value of "true", then the suppression mechanism is applied to the MetricReport being generated (i.e. any Metric in the MetricReport currently be generated will be suppressed and not included in the MetricReport when the value of the Metric equals the value of the same Metric in the previously generated MetricReport) .
- If value of attribute MetricReportHeartbeatInterval is specified(say PT[y]S) and SuppressRepeatedMetricValue attribute has a value of "true", then every PT[y]S , the complete MetricReport will be generated and sent regardless of whether values have changed.
- If value of attribute MetricReportHeartbeatInterval is specified(say PT[y]S) and SuppressRepeatedMetricValue attribute has a value of "false", then this functionality is disabled and MetricReports will be generated at an interval specified by the RecurrenceInterval.

- MetricProperties only support the values defined under the Members of MetricDefinitions URI /redfish/v1/TelemetryService/MetricDefinitions.
- If the “ReportUpdates” property has the value “AppendStopsWhenFull” and if the number of Metric Objects in the MetricValues array of MetricReport Instance has reached the AppendLimit, then no more Metric Objects will be appended to the MetricValues. But still the ReportSequence will get updated in each cycle specified by RecurrenceInterval or MetricReportHeartbeatInterval.

7.6 Metric Report Collection

This resource specifies an abstract metric Value.

It displays a collection of Metric Reports.

7.6.1 GET

7.6.1.1 Request

`https://{ip}/redfish/v1/TelemetryService/MetricReports`

Content-Type: application/json

7.6.1.2 Response

Please refer the sample response below.

```
{
  "@odata.context":
  "/redfish/v1/$metadata#MetricReportCollection.MetricReportCollection",
  "@odata.etag": "\"1581503942\"",
  "@odata.id": "/redfish/v1/TelemetryService/MetricReports",
  "@odata.type": "#MetricReportCollection.MetricReportCollection",
  "Members":
  [
    {
      "@odata.id":
      "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
    },
    {
```

```

        "@odata.id":
        "/redfish/v1/TelemetryService/MetricReports/TemperatureReport"
    }
],
"Members@odata.count": 2,
"Name": "MetricReports"
}

```

7.7 Metric Report Instance

The Metric Report Instance resource specifies the metric report that the Redfish service will create, corresponding to the Metric Report Definition. The Metric Reports are updated periodically based on the recurrence interval specified.

7.7.1 GET

Table 169 Metric Report Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Id	String	True	This property represents an identifier for the resource. All values for resources described by this schema shall comply to the requirements as described in the Redfish specification.
Name	String	True	This object represents the Name property. All values for resources described by this schema shall comply to the requirements as described in the Redfish specification.
MetricReport Definition	Object	True	The value shall be reference to the metric definition for this metric.

Timestamp	String	True	This property represents time associated with the metric report in its entirety. This property shall contain the time when the metric report was generated.		
ReportSequence	String	True	<p>This property shall contain the current sequence identifier for this metric report.</p> <p>Note: This property will get updated each time when the Metric Report updates.</p> <p>When the ReportUpdates property for the MetricReportDefinition associated with the MetricReport is NewReport, then ReportSequence will be “1” always and for all other values of ReportUpdates, the ReportSequence will be incremented by 1 for each update in the MetricReport.</p>		
MetricValues	Object	True	The values shall be metric values for this MetricReport.		
			Properties	Type	Description
			MetricId	String	The value shall be the Identifier of the source metric within the associated MetricDefinition.
			MetricValue	String	The value of the metric represented as a string.
			TimeStamp	String	The value shall be an ISO 8601 date time for when the metric value was computed. Note that this may be different from the time when this instance is created.
			MetricProperty	String	The value shall be an OData conformant URI to a property contained in the scope of the MetricScope.

7.7.1.1 Request

https://{{ip}}/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport

Content-Type: application/json



7.7.1.2 Response

Please refer the sample response below.

```
{
  "@odata.context": "/redfish/v1/$metadata#MetricReport.MetricReport",
  "@odata.etag": "\"1581503942\"",
  "@odata.id":
  "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport",
  "@odata.type": "#MetricReport.v1_2_0.MetricReport",
  "Id": "AverageTemperatureReport", "MetricReportDefinition":
  {
    "@odata.id": "/redfish/v1/TelemetryService/MetricReportDefinitions/
    AverageTemperatureReport"
  },
  "MetricValues":
  [
    {
      "MetricId": "AverageTemperature",
      "MetricProperty": "/redfish/v1/Chassis/Self/Thermal#/
      Temperatures/117_0/ReadingCelsius",
      "MetricValue": "0",
      "Timestamp": "2020-02-12T 05:39:02Z"
    },
    {
      "MetricId": "AverageTemperature",
      "MetricProperty": "/redfish/v1/Chassis/Self/Thermal#/
      Temperatures/116_0/ReadingCelsius",
      "MetricValue": "0",
      "Timestamp": "2020-02-12T 05:39:02Z"
    }
  ],
  "Name": "Average_Temperature_Report",
  "ReportSequence": "1",
}
```

```

    "Timestamp": "2020-02-12T 05:39:02Z"
  }

```

7.8 Trigger Collection

Triggers is an entity which senses or measures any sort of change/deviation in properties of various redfish resources. There are two types of triggers-numeric and discrete triggers. Triggers is not just limited to Voltage, Temp, and Fan sensors. Any property can be monitored through triggers.

Triggers Collection resource displays a collection of triggers, both numeric and discrete.

7.8.1 GET

7.8.1.1 Request

```
https://{{ip}}/redfish/v1/TelemetryService/Triggers
```

```
Content-Type: application/json
```

7.8.1.2 Response

Please refer the sample response below.

```

{
  "@odata.context":
  "/redfish/v1/$metadata#TelemetryService/Triggers(Members,Name,Members@odata.count)",
  "@odata.etag": "W/1527512499\"",
  "@odata.id": "/redfish/v1/TelemetryService/Triggers",
  "@odata.type": "#TriggersCollection.TriggersCollection",
  "Members":
  [
    {
      "@odata.id": "/redfish/v1/TelemetryService/Triggers/TemperatureTrigger"
    },
    {

```

```

        "@odata.id": "/redfish/v1/TelemetryService/Triggers/ChassisLED"
    }
],
"Members@odata.count": 2,
"Name": "Triggers Collection"
}

```

7.8.2 POST

The following properties are mandatory to create a trigger:

- Id
- Name
- MetricType
- TriggerActions
- NumericThresholds or (DiscreteTriggerCondition & DiscreteTriggers)
- MetricProperties

Note:

- Status->State and Status-Health are read-only attributes and cannot be passed in the POST Request Body.
- Only a maximum of 25 triggers can be created.
- For creation of Numeric Triggers, NumericThresholds attribute is mandatory. Four sub-attributes are supported under NumericThresholds attribute – LowerCritical, LowerWarning, UpperCritical and UpperWarning. Not all four sub-attributes are mandatory for Numeric Triggers creation but at least one sub-attribute should be present. It is entirely left up to the Redfish User's choice to have one or more sub-attributes.
- Under each of these four sub-attributes, we again have support for three sub attributes – Activation, DwellTime and Reading. These three attributes are mandatory for each of the four sub-attributes, if specified in the request body.
- For creation of Discrete Triggers, if value of DiscreteTriggerCondition attribute is Changed, then DiscreteTriggers attribute should not be present and if value of DiscreteTriggerCondition attribute is Specified, then DiscreteTriggers attribute should be present.
- DiscreteTriggers attribute should consist of an array of objects where each object can have the following four sub-attributes – Name, Value, Severity and DwellTime. The sub-attributes Value, Severity and DwellTime are mandatory ones whereas Name is an optional one.

7.8.2.1 Request to create Numeric Triggers

https://{ip}/redfish/v1/TelemetryService/Triggers

Content-Type: application/json

```
{
  "Id": "TemperatureTrigger",
  "Name": "Temperature Trigger",
  "MetricType": "Numeric",
  "TriggerActions":
  [
    "LogToLogService",
    "RedfishEvent"
  ],
  "NumericThresholds":
  {
    "LowerCritical":
    {
      "Activation": "Either",
      "DwellTime": "PT1M",
      "Reading": 30
    },
    "LowerWarning":
    {
      "Activation": "Decreasing",
      "DwellTime": "PT1M30S",
      "Reading": 50
    },
    "UpperCritical":
    {
      "Activation": "Increasing",
```

```

        "DwellTime": "PT1M50S",
        "Reading": 80
    },
    "UpperWarning":
    {
        "Activation": "Increasing",
        "DwellTime": "PT30S",
        "Reading": 70
    }
},
"MetricProperties":
[
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/116_0/ReadingCelsius",
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/117_0/ReadingCelsius"
]
}

```

7.8.2.2 Response

HTTP/1.1 201 Created

Location:

http://<IP>/redfish/v1/TelemetryService/Triggers/TemperatureTrigger

```

{
    "@odata.context":
    "/redfish/v1/$metadata#TelemetryService.Triggers
(Name,TriggerActions,MetricProperties,Id,Status,Links,MetricType,
NumericThresholds)",
    "@odata.etag": "\"1573457484\"",
    "@odata.id": "/redfish/v1/TelemetryService/Triggers/TemperatureTrigger",
    "@odata.type": "#Triggers.v1_1_1.Triggers",
    "Id": "TemperatureTrigger",
    "Links": [],

```

```
"MetricProperties":  
[  
  "/redfish/v1/Chassis/Self/Thermal#/Temperatures/116_0/ReadingCelsius",  
  "/redfish/v1/Chassis/Self/Thermal#/Temperatures/117_0/ReadingCelsius"  
],  
"MetricType": "Numeric",  
"Name": "Temperature Trigger",  
"NumericThresholds":  
{  
  "LowerCritical":  
  {  
    "Activation": "Either",  
    "DwellTime": "PT1M",  
    "Reading": 30  
  },  
  "LowerWarning":  
  {  
    "Activation": "Decreasing",  
    "DwellTime": "PT1M30S",  
    "Reading": 50  
  },  
  "UpperCritical":  
  {  
    "Activation": "Increasing",  
    "DwellTime": "PT1M50S",  
    "Reading": 80  
  },  
  "UpperWarning":  
  {  
    "Activation": "Increasing",
```

```

        "DwellTime": "PT30S",
        "Reading": 70
    }
},
"Status":
{
    "Health": "OK",
    "State": "Enabled"
},
"TriggerActions":
[
    "RedfishEvent",
    "LogToLogService"
]
}

```

7.8.2.3 Request to create Discrete Triggers

https://{ip}/redfish/v1/TelemetryService/Triggers

Content-Type: application/json

```

{
    "Id": "ChassisIndicatorLED",
    "Name": "Chassis_IndicatorLED",
    "MetricType": "Discrete",
    "TriggerActions":
    [
        "LogToLogService",
        "RedfishEvent"
    ],
    "DiscreteTriggerCondition": "Specified",
    "DiscreteTriggers":

```

```

[
  {
    "Name": "LED_Blinking",
    "Value": "Blinking",
    "Severity": "Critical",
    "DwellTime": "PT30S"
  }
],
"MetricProperties":
[
  "/redfish/v1/Chassis/Self#/IndicatorLED"
]
}

```

7.8.2.4 Response

HTTP/1.1 201 Created

Location:

<http://<IP>/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED>

```

{
  "@odata.context":
  "/redfish/v1/$metadata#TelemetryService.Triggers(Id,Status,Links,Name,MetricPro
  perties,DiscreteTriggerCondition,DiscreteTriggers,TriggerActions,MetricType,Descri
  ption)",
  "@odata.etag": "\"1583924493\"",
  "@odata.id": "/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED",
  "@odata.type": "#Triggers.v1_1_1.Triggers",
  "Description": "TelemetryService-Triggers-ChassisIndicatorLED",
  "DiscreteTriggerCondition": "Specified",
  "DiscreteTriggers":
  [
    {

```

```

        "DwellTime": "PT30S",
        "Name": "LED_Blinking",
        "Severity": "Critical",
        "Value": "Blinking"
    }
],
"Id": "ChassisIndicatorLED",
"Links": [],
"MetricProperties":
[
    "/redfish/v1/Chassis/Self#/IndicatorLED"
],
"MetricType": "Discrete",
"Name": "Chassis_IndicatorLED",
"Status":
{
    "Health": "OK",
    "State": "Enabled"
},
"TriggerActions":
[
    "RedfishEvent",
    "LogToLogService"
]
}

```

Note : The triggers created can be either numeric or discrete in nature. During each polling cycle of telemetry handler, the current value of each of the metric properties specified in trigger is compared with the specified trigger value.

Whenever a trigger condition occurs for each of the metric properties, the initial point of measurement of dwell time duration is Noted. For each subsequent polling cycle, if the trigger

condition persists, the time duration between the current time and the initial point of measurement of dwell time is calculated and compared with the DwellTime value and if the time difference is greater than or equal to the DwellTime value, the actions specified by the TriggerActions attribute from amongst these (“LogToLogService”, “RedfishEvent” and “RedfishMetricReport”) is being performed.

The current value for the specific MetricProperty is also Noted, in order to avoid triggering of actions for the same set of MetricProperty-MetricValue pair in the subsequent polling cycles. For example, if we do create a numeric trigger with the below mentioned Temperature MetricProperties,

```

{
  .....
  ,
  "NumericThresholds":
  {
    "UpperWarning":
    {
      "Activation": "Increasing",
      "DwellTime": "PT20S",
      "Reading": 10
    }
  },
  "MetricProperties":
  [
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/250_0/ReadingCelsius",
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/116_0/ReadingCelsius",
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/92_0/ReadingCelsius",
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/120_0/ReadingCelsius",
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/33_0/ReadingCelsius",
    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/39_0/ReadingCelsius"
  ],
  .....

```

}

During each polling cycle, the current value of each of the MetricProperties (for e.g. "/redfish/v1/Chassis/Self/Thermal#/Temperatures/250_0/ReadingCelsius") specified above is compared with the specified trigger value (refer value of attribute "Reading" i.e. 10). Whenever a trigger condition occurs (say, "ReadingCelsius" value of Sensor Number 250 goes above 10), the initial point of measurement of dwell time duration is Noted. For each subsequent polling cycle, if the trigger condition persists (i.e. "ReadingCelsius" value of Sensor Number 250 is still above 10), the time duration between the current time and the initial point of measurement of dwell time is calculated and compared with the DwellTime value (i.e. 20 seconds) and if the time difference is greater than or equal to the DwellTime value, the actions specified by the TriggerActions attribute from amongst these ("LogToLogService", "RedfishEvent" and "RedfishMetricReport") is being performed.

The current value for the specific MetricProperty ("/redfish/v1/Chassis/Self/Thermal#/Temperatures/250_0/ReadingCelsius") is also noted. The DwellTime logic is applicable to both numeric and discrete triggers.

Trigger conditions:

- In Numeric Triggers, under the below mentioned scenarios, the trigger condition is met -
 - If Numeric Threshold Activation attribute value is "Increasing", the threshold is activated when the reading changes from a value lower than the threshold to a value higher than the threshold.
 - If Numeric Threshold Activation attribute value is "Decreasing", the threshold is activated when the reading changes from a value higher than the threshold to a value lower than the threshold.
 - If Numeric Threshold Activation attribute value is "Either", the threshold is activated when either the Increasing or Decreasing conditions are met.
- In Discrete Triggers, under the below mentioned scenarios, the trigger condition is met -
 - If the value of DiscreteTriggerCondition attribute is "Changed", whenever the value of any Metric Property changes, the current value of the MetricProperty is compared with the previous value. If there is a change, trigger action is taken. In this case, any value provided under "DiscreteTriggers" attribute is ignored.
 - If the value of DiscreteTriggerCondition attribute is "Specified", whenever the value of any Metric Property matches the specified trigger value, trigger action is taken.
- In the case of Numeric Triggers, MetricProperties only support the values defined under the Members of MetricDefinitions URI

/redfish/v1/TelemetryService/MetricDefinitions. In the case of Discrete Triggers, MetricProperties can support URI properties with value type “string”.

7.9 Trigger Instance

It displays a trigger instance which can be either a numeric or a discrete one.

The following properties are supported for Triggers:

Table 170 Trigger Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Id (M)	String	True	This property represents an identifier for the resource. All values for resources described by this schema shall comply to the requirements as described in the Redfish specification.
Name	String	True	The value of this property shall be the name of the metric.
MetricType	String	True	The value of this property shall specific the type of trigger and should be any one of the enum values – Numeric , Discrete. Note: When value of MetricType is “Numeric”, DiscreteTriggerCondition and DiscreteTriggers attributes are not allowed. When value of MetricType is “Discrete”, NumericThresholds attribute is not allowed.
TriggerActions	Array	True	This property DeNotes the actions to be performed when a trigger condition is met. Supported Values are "LogToLogService", "RedfishEvent", "RedfishMetricReport". LogToLogService: This value indicates that when a trigger condition is met, the Service shall log the occurrence of the condition to the log that the LogService property in the TelemetryService Resource describes.

			<p>RedfishEvent: This value indicates that when a trigger condition is met, the Service shall send an event to subscribers.</p> <p>RedfishMetricReport: This value indicates that when a trigger condition is met, the Service shall force the metric reports specified by the MetricReportDefinitions property to be updated, regardless of the MetricReportDefinitionType property value. The actions specified in the ReportActions property of each MetricReportDefinition shall be performed.</p>			
NumericThresholds	Array	True	This property shall contain list of triggers to which a sensor reading will be compared.			
			Name	Type	Read only	Description
			LowerCritical	Object	True	The value of this property shall indicate the Reading is below the normal range and may require attention. The units shall be the same units as the Reading. Please refer Table 171 Numeric Thresholds Sub-Attributes for the sub attributes under this property.
			LowerWarning	Object	True	The value of this property shall indicate the Reading is below the normal range. The units shall be the same units as the Reading. Please refer Table 171 Numeric Thresholds Sub-Attributes for the sub attributes under this property.
			UpperCritical	Object	True	The value of this property shall indicate the Reading is above the normal range and may require attention. The units shall be the same

						units as the Reading. Please refer Table 171 Numeric Thresholds Sub-Attributes for the sub attributes under this property.
			UpperWarning	Object	True	The value of this property shall indicate the Reading is above the normal range. The units shall be the same units as the Reading. Please refer Table 171 Numeric Thresholds Sub-Attributes for the sub attributes under this property.
Links	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource.			
			Name	Type	Read only	Description
			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document.
			MetricReportDefinitions	Array	True	The value shall be a set of references to existing MetricReportDefinitions that will generate new metric reports when the TriggerActions property contains the value RedfishMetricReport and a trigger condition is met.



			MetricReportDefinitions@odata.count	Integer	True	An integer representing the number of items in a collection.
DiscreteTriggerCondition	String	True	<p>This property shall contain the conditions when a discrete metric needs to trigger. Supported Values are “Specified” and “Changed”.</p> <p>Changed: A discrete trigger condition is met whenever the metric value changes.</p> <p>Specified: A discrete trigger condition is met when the metric value becomes one of the values that the DiscreteTriggers property lists.</p> <p>Note: If the value for this attribute is “Specified”, then the attribute “DiscreteTriggers” should be present.</p> <p>If the value for this attribute is “Changed”, then the attribute “DiscreteTriggers” itself should not be present.</p>			
Status	Object	True	Refer Section 3.3 for Resource.Status.			
Metricproperties	Array	True	<p>A collection of URI for the properties on which this metric definition is defined.</p> <p>Note: In the case of Numeric Triggers, MetricProperties only support the values defined under the Members of MetricDefinitions URI /redfish/v1/TelemetryService/MetricDefinitions. In the case of Discrete Triggers, MetricProperties can support URI properties with value type “string”.</p>			
DiscreteTriggers	Array	True	<p>This property shall contain list of triggers to which a sensor reading will be compared.</p> <p>If the value for “DiscreteTriggerCondition” attribute is “Specified”, then the attribute “DiscreteTriggers” should be present. If the value for “DiscreteTriggerCondition” attribute is “Changed”, then the attribute “DiscreteTriggers” should not be present.</p>			
			Name	Type	Read only	Description
			Name	String	True	Name of discrete trigger
			Value	String	True	This property shall contain the discrete metric value



						that constitutes a trigger event. The DwellTime shall be measured from this point in time. Note: This attribute is mandatory for Specified Discrete Trigger creation.
			Severity	Resource. Health	True	The value of this property is used for the Severity property in the Event message Note: This attribute is mandatory for Specified Discrete Trigger creation.
			DwellTime	Number	True	This property shall contain the amount of time that a trigger event persists before the MetricAction is performed. Supported format for DwellTime is "-?(P)(T(\d+H)?(\d+M)?(\d+(\.\d+)?)S)??" Note: This attribute is mandatory for Specified Discrete Trigger creation.

Table 171 Numeric Thresholds Sub-Attributes

Name	Type	Read Only	Description
Reading	String	False	This property shall indicate the Reading value of this Sensor that triggers the threshold. The units of this property shall follow the same units as the property described by MetricProperties. Note: This attribute is mandatory for Numeric Trigger creation.



DwellTime	String	False	<p>This property shall indicate the time interval over which the sensor reading must have passed through this Threshold value before the threshold is considered to be violated.</p> <p>Note: This attribute is mandatory for Numeric Trigger creation.</p>
Activation	String	False	<p>This property shall indicate the direction of crossing of the Reading value for this Sensor that triggers the threshold. Supported Values can be either of these: "Increasing", "Decreasing" or "Either".</p> <p>Decreasing: This threshold is activated when the reading changes from a value higher than the threshold to a value lower than the threshold.</p> <p>Either: This threshold is activated when either the Increasing or Decreasing conditions are met.</p> <p>Increasing: This threshold is activated when the reading changes from a value lower than the threshold to a value higher than the threshold.</p> <p>Note: This attribute is mandatory for Numeric Trigger creation.</p>

7.9.1 GET

7.9.1.1 Request

<https://{{ip}}/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED>

Content-Type: application/json

7.9.1.2 Response

Please refer the sample response below.

```
{
  "@odata.context":
    "/redfish/v1/$metadata#TelemetryService.Triggers(Id,Status,Links,Name,MetricProperties,DiscreteTriggerCondition,DiscreteTriggers,TriggerActions,MetricType,Description)",
  "@odata.etag": "\"1583924493\"",

```

```
"@odata.id": "/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED",
"@odata.type": "#Triggers.v1_1_1.Triggers",
>Description": "TelemetryService-Triggers-ChassisIndicatorLED",
>DiscreteTriggerCondition": "Specified",
>DiscreteTriggers":
> [
>   {
>     "DwellTime": "PT30S",
>     "Name": "LED_Blinking",
>     "Severity": "Critical",
>     "Value": "Blinking"
>   }
> ],
>Id": "ChassisIndicatorLED",
>Links": [],
>MetricProperties":
> [
>   "/redfish/v1/Chassis/Self#/IndicatorLED"
> ],
>MetricType": "Discrete",
>Name": "Chassis_IndicatorLED",
>Status":
> {
>   "Health": "OK",
>   "State": "Enabled"
> },
>TriggerActions":
> [
>   "RedfishEvent",
>   "LogToLogService"
```

```
    ]
  }
```

7.9.2 DELETE

The DELETE operation is used to delete either a numeric or a discrete trigger.

7.9.2.1 Request

`https://{ip}/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED`

Content-Type: application/json

7.9.2.2 Response

HTTP/1.1 204 No Content

7.10 Telemetry Log Service

This resource represents the log service for the resource or service to which it is associated. This resource shall be used to represent a log service for a Redfish implementation.

Metric Report Logs are supported under Telemetry Log Services.

Note: Maximum number is limited to 100

`/redfish/v1/TelemetryService/LogService`

7.10.1 GET

7.10.1.1 Request

`https://{ip}/redfish/v1/TelemetryService/LogService`

Content-Type: application/json

7.10.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 172 Log Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
ServiceEnabled	Boolean	False	Indicates whether this service is enabled. Default it will be null value
DateTime	String	False	The current DateTime (with offset from UTC) for the log service in Redfish Timestamp format. Note: The valid range is -12:00 to +14:00. Please refer the following link for the allowable values within the above specified range. https://en.wikipedia.org/wiki/List_of_UTC_time_offsets
DateTimeLocalOffset	String	False	The time offset from UTC that the DateTime property is set to in format: +06:00. Note: The valid range is -12:00 to +14:00. Please refer the following link for the allowable values within the above specified range. https://en.wikipedia.org/wiki/List_of_UTC_time_offsets

MaxNumber OfRecords(C)	Number	True	The maximum numbers of LogEntries this service can have. Min value:0 Note: Maximum number is limited to 100.	
OverWritePol icy(C)	String	True	Indicates the policy of the log service when the MaxNumberOfRecords has been reached or when the log is full.	
			Enum	Description
			WrapsWhenFull	When full, new entries to the Log will overwrite previous entries.
Actions	Object	True	The Actions property shall contain the available actions for this resource link Section 3.3 LogService.ClearLog or any other OEMActions.	
Status	Object	True	Refer Section 3.3 for Resource.Status.	
Entries(N)	Object	True	The value of this property shall reference a collection of resources of type LogEntry .	

7.10.2 POST

7.10.2.1 Request

https://{{ip}}/redfish/v1/TelemetryService/LogService/Actions/LogService.ClearLog

Content-Type: application/json

Example POST Request Body:

```
{
  "ClearType": "ClearAll"
}
```

7.10.2.2 Response

The response of the request will be in JSON format with the success status code as 202. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

```
{
  "@odata.context":
  "/redfish/v1/$metadata#Task.Task(TaskState,Description,Name,Id)",
```

```
"@odata.id": "/redfish/v1/TaskService/Tasks/1",  
"@odata.type": "#Task.v1_4_2.Task",  
"Description": "Task for Telemetry LogService",  
"Id": "1",  
"Name": " TelemetryLogService ",  
"TaskState": "New"  
}
```

7.11 Telemetry Log Entry Collection

This represents the collection of Log Entry resources

7.11.1 GET

7.11.1.1 Request

`https://{{ip}}/redfish/v1/TelemetryService/LogService/Entries`

Content-Type: application/json

7.11.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties

7.12 Telemetry Log Entry

This resource represents the log record format for logs.

7.12.1 GET

7.12.1.1 Request

https://{{ip}}/redfish/v1/TelemetryService/LogService/Entries/
{{metricreport_logentry_instance}}

Content-Type: application/json

7.12.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 173 Log Entry Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Severity	String	True	This is the severity of the log entry. It can take any one of the Enum values - OK, Warning or Critical.
Created	String	True	The time the log entry was created.
EntryType(M)	String	True	This property shall represent the type of LogEntry. If the resource represents an IPMI SEL log entry, the value shall be SEL. If the resource represents an Event log, the value shall be Event. If the resource represents an OEM log format, the value shall be Oem. Enum can be Event, SEL or Oem.

EntryCode	String	True	This property shall be present if the EntryType value is SEL. These enumerations are the values from table 42-1 and 42-2 of the IPMI specification.	
			Type	String
			String	Assert Deassert Lower Non-critical - going low Lower Non-critical - going high Lower Critical - going low Lower Critical - going high Lower Non-recoverable - going low Lower Non-recoverable - going high Upper Non-critical - going low Upper Non-critical - going high Upper Critical - going low Upper Critical - going high Upper Non-recoverable - going low Upper Non-recoverable - going high Transition to Idle Transition to Active Transition to Busy State Deasserted State Asserted Predictive Failure deasserted Predictive Failure asserted Limit Not Exceeded Limit Exceeded Performance Met Performance Lags Transition to OK

				<p>Transition to Non-Critical from OK</p> <p>Transition to Critical from less severe</p> <p>Transition to Non-recoverable from less severe</p> <p>Transition to Critical from Non- recoverable</p> <p>Transition to Non-recoverable</p> <p>Monitor</p> <p>Informational</p> <p>Device Removed /Device Absent</p> <p>Device Inserted /Device Present</p> <p>Device Disabled</p> <p>Device Enabled</p> <p>Transition to Running</p> <p>Transition to In Test</p> <p>Transition to Power Off</p> <p>Transition to On Line Transition to Off Line</p> <p>Transition to Off Duty</p> <p>Transition to Degraded</p> <p>Transition to Power Save</p> <p>Install Error</p> <p>Fully Redundant</p> <p>Redundancy Lost</p> <p>Redundancy Degraded</p> <p>Non-redundant: Sufficient Resources from Redundant</p> <p>Non-redundant: Sufficient Resources from Insufficient Resources</p> <p>Non-redundant: Insufficient Resources</p> <p>Redundancy Degraded from Fully Redundant</p> <p>Redundancy Degraded from Non- redundant</p> <p>D0 Power State</p>
--	--	--	--	--



				D1 Power State D2 Power State D3 Power State		
Message	String	True	<p>This property shall be the Message property of the event and decodes from EntryType: If it is Event then it is a message Description. Otherwise, it is SEL or Oem specific. In most cases, this will be the actual Log Entry.</p> <p>Note: Populated only for AuditLogs.</p>			
MessageId	String	True	<p>This property shall the MessageId property of the event and decodes from EntryType: If it is Event then it is a message id. Otherwise, it is SEL or Oem specific. This value is only used for registries - for more information, see the specification.</p> <p>Note: The value will be "Ipmi.2.0.GeneralEventData" for managers SEL and Systems BIOS.</p>			
MessageArgs	Array	True	<p>This attribute contains a link to the sensor resource that has exceeded/receded the specified threshold values.</p>			
Links	Object		<p>Contains references to other resources that are related to this resource.</p>			
			Name	Type	Read Only	Description
			Oem	Object		Refer Section 3.3 for Links under Resource Complex Types.
			OriginOfCondition	Object	True	<p>This is the URI of the resource that caused the log entry.</p> <p>Refer idRef in odata4.0.0.json.</p>

8 Composability

8.1 Composition Service

Composition Service contains the links of ResourceBlocks and Resource Zones collections.

8.1.1 GET

8.1.1.1 Request

https://{{ip}}/redfish/v1/CompositionService

Content-Type: application/json

8.1.1.2 Response

Table 174 Composition Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3

Status	Object	True	Refer Section 3.3 for Resource.Oem.
ServiceEnabled	Boolean	False	Indicates whether this service is enabled.
ResourceBlocks	Object	True	Contains the resource blocks available on the service.
ResourceZones	Object	True	Contains the resource zones available on the service.

8.1.2 PATCH

8.1.2.1 Request

`https://{{ip}}/redfish/v1/CompositionService`

Content-Type: application/json

Example PATCH Request Body:

```
{
  "ServiceEnabled": true
}
```

8.1.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#)

8.2 ResourceBlocks Collection

This resource shall be used to represent a collection of resourceblocks.

8.2.1 GET

8.2.1.1 Request

`https://{{ip}}/redfish/v1/CompositionService/ResourceBlocks`

Content-Type: application/json

8.2.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

8.3 ResourceBlocks

ComputeBlock: Contains the Inventory of resources like Memory and processor instances populated from Systems/Self.

DrivesBlock: Contains the Inventory of resources like Storage instance populated from Systems/Self.

NetworkBlock: Contains the Inventory of resources like EthernetInterface instance populated from Systems/Self.

8.3.1 GET

8.3.1.1 Request

`https://{{ip}}/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock`

(or)

`https://{{ip}}/redfish/v1/CompositionService/ResourceBlocks/DrivesBlock`

(or)

`https://{{ip}}/redfish/v1/CompositionService/ResourceBlocks/NetworkBlock`

Content-Type: application/json

8.3.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 175 Resource Block Instance Properties

Name	Type	Read Only	Description
------	------	-----------	-------------

@odata.context	String	True	Refer Section 3.1			
@odata.id	String	True	Refer Section 3.1			
@odata.type	String	True	Refer Section 3.1			
@odata.etag	String	True	Refer Section 3.1			
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document			
Id(M)	String	True	Resource Identifier			
Name(M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
Status	Object	True	Refer Section 3.3 for Resource.Oem.			
Composition Status(M)	Object	False	This property describes the composition status details for this Resource Block.			
			Name	Type	Read Only	Description
			Reserved	boolean	False	This represents if the Resource Block is reserved by any client. Default it will be null value
			SharingCapable	Boolean	True	This represents if the Resource Block is reserved by any client.
			SharingEnabled	Boolean	True	Indicates if this Resource Block is allowed to participate in multiple compositions simultaneously. Default it will be null value
			MaxCompositions	Number	True	The maximum number of compositions in which this Resource Block is capable of participating simultaneously.

			NumberOfCompositions	Number	True	The number of compositions in which this Resource Block is currently participating.	
			CompositionState	String	True	This property represents the current state of the Resource Block from a composition perspective.	
						Name	Description
						Composed	Final successful state of a Resource Block which has participated in composition.
						Unused	Indicates the Resource Block is free and can participate in composition.
ResourceBlockType(M)	Array	True	This property represents the types of resources available on this Resource Block.				
Links	Object	True	Contains references to other resources that are related to this resource.				
			Name	Type	Read Only	Description	
			Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to "How to Add OEM extensions" document	
			ComputerSystems	Array	true	An array of references to the Computer Systems that are composed from this Resource Block.	

			Chassis	Array	true	An array of references to the Chassis in which this Resource Block is contained.
			Zones	Array	true	An array of references to the Zones in which this Resource Block is bound.
Processors	Array	True	An array of references to the Processors available in this Resource Block. Note: This reference link will be populated only for ComputeBlock.			
Memory	Array	True	An array of references to the Memory available in this Resource Block. Note: This reference link will be populated only for ComputeBlock.			
Storage	Array	True	An array of references to the Storage available in this Resource Block. Note: This reference link will be populated only for DrivesBlock.			
SimpleStorage	Array	True	An array of references to the Simple Storage available in this Resource Block. Note: This reference link will be populated only for DrivesBlock.			
Drives	Array	True	An array of references to the Storage Drives available in this Resource Block. Note: This reference link will be populated only for DrivesBlock.			
EthernetInterfaces	Array	True	An array of references to the Ethernet Interfaces available in this Resource Block. Note: This reference link will be populated only for NetworkBlock.			

8.3.2 PATCH

8.3.2.1 Request

<https://{{ip}}/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock>



(or)

https://{{ip}}/redfish/v1/CompositionService/ResourceBlocks/DrivesBlock

(or)

https://{{ip}}/redfish/v1/CompositionService/ResourceBlocks/NetworkBlock

Content-Type: application/json

Example PATCH Request Body:

```
{
  "CompositionStatus":
  {
    "Reserved": false
  }
}
```

8.3.2.2 *Response*

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#)

8.4 ResourceZone Collection

This resource shall be used to represent a collection of ResourceZones

8.4.1 GET

8.4.1.1 *Request*

https://{{ip}}/redfish/v1/CompositionService/ResourceZones

Content-Type: application/json

8.4.1.2 *Response*

Please refer [Section 3.5](#) for the JSON response properties.

8.5 ResourceZone

8.5.1 GET

8.5.1.1 Request

https://{{ip}}/redfish/v1/CompositionService/ResourceZones/1

Content-Type: application/json

8.5.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 176 ResourceZone Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Status	Object	True	Refer Section 3.3 for Resource.Status.
Links	Object	True	Contains references to other resources that are related to this resource.

Name	Type	Read Only	Description
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document
Resource Blocks	Array	true	An array of references to the Resource Blocks that are used in this Zone.

Note: The response contains CollectionCapabilities annotation "@Redfish.CollectionCapabilities" which is explained under the [Section 8.6](#)

8.6 CollectionCapabilities Annotation

The CollectionCapabilities annotation allows a client to discover which collections in the service support compositions, and how the POST request for the collection is formatted, as well as what properties are required.

"@Redfish.CollectionCapabilities" is available under the following resources:-

- Systems Collection - “redfish/v1/Systems”
- ResourceZone Instance - “redfish/v1/CompositionService/ResourceZones/1”

The following attributes are available in @Redfish.CollectionCapabilities annotation :-

Table 177 Collection Capabilities Annotation Property List

Name	Type	Read Only	Description
UseCase	String	True	This property represents the use case in which a client may issue a POST request to the collection.
			Enum



			ComputerSystemComposition	This capability describes a client creating a new ComputerSystem instance from a set of disaggregated hardware		
Links (M)	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource.			
			Name	Type	Read Only	Description
			RelatedItem	Array	True	The ID(s) of the resources associated with this capability.
			TargetCollection(M)	Array	True	Reference to the collection that this capabilities structure is describing
CapabilitiesObject	Object	True	Reference to the resource the client may GET to in order to understand how to form a POST request for a given collection.			

8.7 Capabilities

Capabilities Indicates the properties to be included in a composed system.

8.7.1 GET

8.7.1.1 Request

<https://{{ip}}/redfish/v1/Systems/Capabilities>

Content-Type: application/json

8.7.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table

Table 178 Capabilities Property List



Name	Type	Read Only	Description								
@odata.context	String	True	Refer Section 3.1								
@odata.id	String	True	Refer Section 3.1								
@odata.type	String	True	Refer Section 3.1								
@odata.etag	String	True	Refer Section 3.1								
Id	String	True	Resource Identifier								
Name (M)	String	True	Name of the Resource								
Description	String	True	Provides description of the resource. Refer Section 3.3								
Links (M)	Object	True	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource								
			<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Read Only</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Resource Blocks</td> <td>Array</td> <td>False</td> <td>An array of references to the Resource Blocks</td> </tr> </tbody> </table>	Name	Type	Read Only	Description	Resource Blocks	Array	False	An array of references to the Resource Blocks
			Name	Type	Read Only	Description					
Resource Blocks	Array	False	An array of references to the Resource Blocks								
HostName	String	False	<p>The value of this property shall be the host name for the system, as reported by the operating system or hypervisor. This value is typically provided to the Manager by a service running in the host operating system.</p> <p>Note: Northbound API is supported but still requires host interface and host agent support from host agent and in-band communication channel and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>								
Boot	Object	False	<p>This object shall contain properties which describe boot information for the current resource. Changes to this object do not alter the BIOS persistent boot order configuration. Refer Table 21 ComputerSystem – Boot Properties.</p>								

Table 179 List of Property Annotation and Description

Property Annotation	Description
---------------------	-------------



Redfish.RequiredOnCreate	The client must provide the given property in the body of the create (POST) request.
Redfish.OptionalOnCreate	The client may provide the property in the body of the create (POST) request.
Redfish.SetOnlyOnCreate	If the client has a specific value needed for the property, it must be provided in the body of the create (POST) request; this property is likely a "Read Only" property after the resource's creation.
Redfish.UpdatableAfterCreate	The client is allowed to update the property after the resource is created.
Redfish.AllowableValues	The client is allowed to use any of the specified values in the body of the create (POST) request for the given property.

Table 180 List of Annotations being used in Capabilities and its respective value

Property Annotation	Value
BootSourceOverrideEnabled@Redfish.OptionalOnCreate	"true"
BootSourceOverrideEnabled@Redfish.UpdatableAfterCreate	"true"
BootSourceOverrideTarget@Redfish.OptionalOnCreate	"true"
BootSourceOverrideTarget@Redfish.UpdatableAfterCreate	"true"
Boot@Redfish.OptionalOnCreate	"true"
Description@Redfish.OptionalOnCreate	"true"
Description@Redfish.SetOnlyOnCreate	"true"
HostName@Redfish.OptionalOnCreate	"true"
HostName@Redfish.UpdatableAfterCreate	"true"
ResourceBlocks@Redfish.RequiredOnCreate	"true"
ResourceBlocks@Redfish.UpdatableAfterCreate	"true"
Links@Redfish.RequiredOnCreate	"true"
Name@Redfish.RequiredOnCreate	"true"
Name@Redfish.SetOnlyOnCreate	"true"

8.8 Compose a System

Client creates a composed system after identifying the needed resource blocks and the given capabilities information in the resource zone.

8.8.1 POST

In the request, the client is creating a new Computer System using the Resource Blocks "ComputeBlock", "DrivesBlock" and "NetworkBlock".

Note:

- For composing a system, an unused ResourceBlock link must be given under "ResourceBlocks" property.
- The "ComputeBlock" must be provided in the POST request ResourceBlock property only when Processors/Memory instances are available.
- The "DrivesBlock" must be provided in the POST request ResourceBlock property only when Storage/SimpleStorage instances are available.
- The "NetworkBlock" must be provided in the POST request ResourceBlock property only when EthernetInterfaces instances are available.

8.8.1.1 Request

POST `https://{ip}/redfish/v1/Systems`

Content-Type: application/json

Example POST Request Body:

```
{
  "Name": "NewSystem",
  "Links":
  {
    "ResourceBlocks":
    [
      {"@odata.id":
        "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock" },
      {"@odata.id":
        "/redfish/v1/CompositionService/ResourceBlocks/DrivesBlock" }
      {"@odata.id":
        "/redfish/v1/CompositionService/ResourceBlocks/NetworkBlock" }
    ]
  }
}
```

```

    },
    "HostName" : "Intel"
  }

```

8.8.1.2 Response

The response status is 201 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

8.8.2 GET

To get the newly created composed system

8.8.2.1 Request

`https://{ip}/redfish/v1/Systems/{new_system}`

Content-Type: application/json

8.8.2.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 181 Newly Composed System Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 .

			Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.			
Id	String	True	Resource Identifier			
Name (M)	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section 3.3			
SystemType	String	True	An enumeration that indicates the kind of system that this resource represents.			
Actions	Object	True	ComputerSystem allows the user to perform Reser Action and it’sallowable values are as given in Section 3.3 . Please refer Reset enum type under Resource.			
Links (M)	Object	False	The Links property, as described by the Redfish Specification, shall contain references to resources that are related to, but not contained by (subordinate to), this resource			
			Name	Type	Read Only	Description
			Resource Blocks	Array	False	An array of references to the Resource Blocks
UUID	String	True	<p>The value of this property shall be used to contain a universal unique identifier number for the system. RFC4122 describes methods that can be used to create the value. The value should be considered to be opaque. Client software should only treat the overall value as a universally unique identifier and should not interpret any sub-fields within the UUID.</p> <p>Note: This can be populated by Host Interface, (Extra Bios Support is needed)</p>			
HostName	String	False	<p>The value of this property shall be the host name for this system, as reported by the operating system or hypervisor. This value is typically provided to the Manager by a service running in the host operating system.</p> <p>Note: Northbound API is supported but still requires host interface and host agent support from host agent and in-band communication channel and platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</p>			
PowerState	String	True	The current power state of the system.			

			Note: This can be populated by Host Interface, (Extra Bios Support is needed)										
			<table border="1"> <thead> <tr> <th>Enum</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>On</td> <td>The system is powered on.</td> </tr> <tr> <td>Off</td> <td>The system is powered off, although some components may continue to have AUX power such as management controller.</td> </tr> <tr> <td>PoweringOn</td> <td>A temporary state between Off and On. This temporary state can be very short.</td> </tr> <tr> <td>PoweringOff</td> <td>A temporary state between On and Off. The power off action can take time while the OS is in the shutdown process.</td> </tr> </tbody> </table>	Enum	Description	On	The system is powered on.	Off	The system is powered off, although some components may continue to have AUX power such as management controller.	PoweringOn	A temporary state between Off and On. This temporary state can be very short.	PoweringOff	A temporary state between On and Off. The power off action can take time while the OS is in the shutdown process.
Enum	Description												
On	The system is powered on.												
Off	The system is powered off, although some components may continue to have AUX power such as management controller.												
PoweringOn	A temporary state between Off and On. This temporary state can be very short.												
PoweringOff	A temporary state between On and Off. The power off action can take time while the OS is in the shutdown process.												
Boot	Object	False	<p>This object shall contain properties which describe boot information for the current resource. Changes to this object do not alter the BIOS persistent boot order configuration. Refer Table 21 ComputerSystem – Boot Properties.</p> <p>Note: This can be populated by Host Interface, (Extra Bios Support is needed)</p>										
Processors(N)	Object	True	<p>A reference to the collection of Processors associated with this system.</p> <p>Note: This can be populated by Host Interface, (Extra Bios Support is needed)</p>										
EthernetInterfaces(N)	Object	True	<p>A reference to the collection of Ethernet interfaces associated with this system.</p> <p>Note: This can be populated by Host Interface, (Extra Bios Support is needed)</p>										
SimpleStorage(N)	Object	True	<p>A reference to the collection of storage devices associated with this system.</p> <p>Note: This can be populated by Host Interface, (Extra Bios Support is needed)</p>										
Memory(N)	Object	True	<p>A reference to the collection of Memory associated with this system.</p>										

			Note: This can be populated by Host Interface, (Extra Bios Support is needed)
Storage(N)	Object	True	A reference to the collection of storage devices associated with this system. Note: This can be populated by Host Interface, (Extra Bios Support is needed)

8.8.3 PATCH

The client can update an already created composition through PATCH. This can be done by updating the ResourceBlocks array found in the composed resource. When using PATCH, the same array semantics should be applied.

8.8.3.1 Request

`https://{{ip}}/redfish/v1/Systems/{{new_system}}`

Content-Type: application/json

Example PATCH Request Body:

```
{
  "Links":
  {
    "ResourceBlocks":
    [
      {},
      {
        "@odata.id":
        "/redfish/v1/CompositionService/ResourceBlocks/NetworkBlock"
      }
    ]
  }
}
```


8.8.3.2 *Response*

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

8.8.4 DELETE

8.8.4.1 *Request*

DELETE `https://{{ip}}/redfish/v1/Systems/{{new_system}}`

Content-Type: application/json

8.8.4.2 *Response*

The response status is 204 and no response body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

9 Dynamic Redfish Extension

This resource represents the root of the Redfish Dynamic Extension, located at the “/redfish/v1/” URI. As a hypermedia API, all DRE resources accessible through the Redfish interface on this device are linked to this URI.

9.1 Dynamic Extension Root

This resource represents the root of the Dynamic Extension.

9.1.1 GET

9.1.1.1 Request

https://{{ip}}/redfish/v1/DynamicExtension

Content-Type: application/json

9.1.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 182 Dynamic Extension Properties

Name	Type	Read Only	Description
@odata.cont ext	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document.

			Refer below table “Oem Object” for more information.
Id(M)	String	True	Refer Section 3.3
Name(M)	String	True	Refer Section 3.3
Description	String	True	Provides description of the resource. Refer Section 3.3
LogServices	String	True	Displays the LogServices related to DRE.
RedfishExtensions	Object	True	A reference to the collection of RedfishExtensions pushed onto redfish from DRE.
GamiExtensions	Object	True	A reference to the collection of GamiExtensions pushed onto redfish from DRE.

9.2 Dynamic Extension Collection

It displays a collection of DynamicExtension resource instances.

9.2.1 GET

9.2.1.1 Request

`https://{ip}/redfish/v1/DynamicExtension/RedfishExtensions`

`https://{ip}/redfish/v1/DynamicExtension/GamiExtensions`

Content-Type: application/json

9.2.1.2 Response

Please refer [Section 3.5](#) for the JSON response properties.

9.3 Dynamic Extension Instance

9.3.1 GET

9.3.1.1 Request

https://{{ip}}/redfish/v1/DynamicExtension/RedfishExtensions/
 {{RedfishExtension_instance}}

https://{{ip}}/redfish/v1/DynamicExtension/GamiExtensions/
 {{GamiExtension_instance}}

Content-Type: application/json

9.3.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in the following table.

Table 183 Dynamic Extension Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Id(M)	String	True	Refer Section 3.3
Name(M)	String	True	Refer Section 3.3
Description	String	True	Provides description of the resource. Refer Section 3.3
Created	String	True	This represents when the extension was created.
DirectoryName	String	True	This represents the name of the directory where the extension was installed.
Md5Checksum	String	True	This represents the MD5 checksum of the tar.gz file that contained the extension.
Running	Boolean	True	This represents if the extension is currently running.
PendingDeletion	Boolean	True	This represents if the extension is currently running, but will be deleted on the next service restart

9.3.2 DELETE

9.3.2.1 Request

https://{{ip}}/redfish/v1/DynamicExtension/RedfishExtensions/
{{RedfishExtension_instance}}

https://{{ip}}/redfish/v1/DynamicExtension/GamiExtensions/
{{GamiExtension_instance}}

Content-Type: application/json

9.3.2.2 Response

The response of the request will be 204 without any response content.

9.4 Dynamic Extension LogServices

It displays a DynamicExtension resource instance.

9.4.1 GET

9.4.1.1 Request

https://{{ip}}/redfish/v1/DynamicExtension/LogServices

Content-Type: application/json

9.4.1.2 Response

The response of the request will be in JSON format. The properties are mentioned in Section 3.18.5.

10 Redfish Inventory Support

In BMC, Redfish Inventory will be populated if :-

- HostInterface support is enabled in Redfish PRJ Configuration.
- ASUS BIOS with Redfish Support is available.

Important: Please contact with your sales representative for further information on ASUS BIOS Package distribution for Redfish Inventory Support.

OR

Northbound API is supported but still requires host agent support from host agent and in-band communication channel and platform specific porting needed (require specific platform libraries support and hook between the specific libraries and gami module should be added.)

Host Agent should be running in Host and should be capable to send this information through a channel created between Host & BMC like IPMI/KCS/USB interface etc or by some other proprietary protocol.

Sync agent OEM extension should be written in which this data should be written onto redis db. Customer can refer section 1.3 in “How to add OEM Extensions” for it.

Important: Host Interface-based System Inventory will not be populated in SPX-13.0 RTP 1.8 release as LAN over USB is not enabled.

The following are the resource URI's that can be populated through Host Interface:-

Resources under Systems

- Processor, SubProcessors, ProcessorMetrics, AccelerationFunctions
- Memory
- MemoryDomains, MemoryChunks and MemoryMetrics
- EthernetInterfaces, VLANNetworkInterface (Systems)
- NetworkInterfaces
- Storage, Volume, Drives
- SecureBoot
- Bios
- SimpleStorage
- Systems - Boot related properties like BootOptions,BootOrder, Certificates (Boot).

Resources under Chassis

- NetworkAdapters
- NetworkDeviceFunctions, VLANNetworkInterface
- NetworkPort

- PCIeDevices, PCIeFunctions
- PCIeSlots
- Assembly

11 NCSI Interface

NCSI is the industrial standards of the sideband interface network controller for server out-of-band management, which is defined by Distributed Management Task Force (DMTF). It involves one management controller and multiple network controllers. DMTF defines a complete set of Ethernet-based control command requests and response standards for NCSI. In addition, NCSI supports the single-thread and timeout retransmission mechanisms. Out-of-band management enables users to connect to a server through the network at any place, to manage and maintain devices.

Note: Network Link Configuration (auto negotiation, link speed, duplex settings) cannot be saved when NCSI is active

12 Operation Apply Time

Operation Apply Time will run as a task service and it is used to specify when the operation should be executed. Services may accept the `@Redfish.OperationApplyTime` annotation in the POST (create), DELETE (delete), or POST (action) request body. This annotation enables the client to control when an operation is carried out.

For example, if the client wants to delete a particular Volume resource, but can only safely do so when a reset occurs, the client can use this annotation to instruct the service to delete the Volume on the next reset.

If multiple operations are pending, the service shall process them in the order in which the service receives them.

Services that support the `@Redfish.OperationApplyTime` annotation for create and delete operations on a Resource Collection shall include the `@Redfish.OperationApplyTimeSupport` response annotation for the Resource Collection.

Services that support the `@Redfish.OperationApplyTime` annotation for an action shall include the `@Redfish.OperationApplyTimeSupport` response annotation for the action.

12.1 Supported URI's:

Reset Actions

- <https://{{ip}}/redfish/v1/Chassis/Self/Actions/Chassis.Reset>
- <https://{{ip}}/redfish/v1/Managers/Self/Actions/Manager.Reset>
- <https://{{ip}}/redfish/v1/Systems/Self/Actions/ComputerSystem.Reset>

Log service Actions (ClearLog)

- <https://{{ip}}/redfish/v1/Managers/Self/LogServices/SEL/Actions/LogService.ClearLog>
- <https://{{ip}}/redfish/v1/Managers/Self/LogServices/AuditLog/Actions/LogService.ClearLog>
- <https://{{ip}}/redfish/v1/Managers/Self/LogServices/EventLog/Actions/LogService.ClearLog>
- <https://{{ip}}/redfish/v1/Chassis/Self/LogServices/Logs/Actions/LogService.ClearLog>
- <https://{{ip}}/redfish/v1/Systems/Self/LogServices/BIOS/Actions/LogService.ClearLog>

12.1.1 Reset Action:

12.1.1.1 Request

https://{{ip}}/redfish/v1/Chassis/Self/Actions/Chassis.Reset

https://{{ip}}/redfish/v1/Managers/Self/Actions/Manager.Reset

https://{{ip}}/redfish/v1/Systems/Self/Actions/ComputerSystem.Reset

Content-Type: application/json

Sample POST Request Body:

```
{
  "ResetType": "On",
  "@Redfish.OperationApplyTime": "AtMaintenanceWindowStart",
  "MaintenanceWindowStartTime": "2019-10-25T02:00:00+05:30"
}
```

12.1.1.2 Response

The response of the request will be in JSON format with the success status code as 202.

Sample Response:

```
{
  "@odata.context":
  "/redfish/v1/$metadata#Task.Task(Description,TaskState,Name,Id)",
  "@odata.id": "/redfish/v1/TaskService/Tasks/2",
  "@odata.type": "#Task.v1_4_2.Task",
  "Description": "Task for Chassis LogService Maintenance Window Task",
  "Id": "2",
  "Name": "Chassis LogService Maintenance Window Task",
  "TaskState": "New"
}
```

12.1.2 ClearLog Action:

12.1.2.1 Request

https://{ip}/redfish/v1/Managers/Self/LogServices/SEL/Actions/LogService.ClearLog

https://{ip}/redfish/v1/Managers/Self/LogServices/AuditLog/Actions/LogService.ClearLog

https://{ip}/redfish/v1/Managers/Self/LogServices/EventLog/Actions/LogService.ClearLog

https://{ip}/redfish/v1/Systems/Self/LogServices/BIOS/Actions/LogService.ClearLog

https://{ip}/redfish/v1/Chassis/Self/LogServices/Logs/Actions/LogService.ClearLog

Content-Type: application/json

Sample POST Request Body:

```
{
  "ClearType" : "ClearAll",
  "@Redfish.OperationApplyTime": "AtMaintenanceWindowStart",
  "MaintenanceWindowStartTime" : "2020-10-25T02:00:00+05:30"
}
```

12.1.2.2 Response

The response of the request will be in JSON format with the success status code as 202.

Sample Response:

```
{
  "@odata.context":
  "/redfish/v1/$metadata#Task.Task(Description,TaskState,Name,Id)",
  "@odata.id": "/redfish/v1/TaskService/Tasks/1",
  "@odata.type": "#Task.v1_4_2.Task",
  "Description": "Task for Maintenance Window Task",
  "Id": "1",
  "Name": "Maintenance Window Task",
  "TaskState": "New"
}
```

Table 184 Operation Apply Time Response

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
Id(M)	String	True	Refer Section 3.1
Name(M)	String	True	Refer Section 3.1
Description	String	True	Provides description of the resource. Refer Section 3.3
TaskState	String	True	Please refer TaskState property in Table 76 Task Property.

Table 185 Redfish Settings Operation Apply Time GET response

Name	Type	Read Only	Description	
@odata.id	String	True	Refer Section 3.1	
@odata.type	String	True	Refer Section 3.1	
MaintenanceWindowDurationInSeconds	number	True	This property indicates the expiry time of maintenance window in seconds.	
MaintenanceWindowResource	String	True	This property indicates the location of the maintenance window settings.	
MaintenanceWindowStartTime	String	True	This property indicates the start time of a maintenance window specified by client.	
SupportedValues	Array	True	The time when the settings can be applied. A service shall advertise its applytime capabilities using this property as to when a Setting resource can be applied.	
			Enum	Description
			Immediate	Apply immediately.
			OnReset	Apply on a reset

			AtMaintenanceWindowStart	Apply during a maintenance window as specified by an administrator.
			InMaintenanceWindowOnReset	Apply after a reset but within maintenance window as specified by an administrator.

Table 186 Redfish Settings Operation Apply Time - POST request parameters

Name	Type	Read Only	Description	
@Redfish.OperationApplyTime	String	False	The time when the settings can be applied. A service shall advertise its applytime capabilities using this property as to when a Setting resource can be applied.	
			Enum	Description
			Immediate	Apply immediately.
			OnReset	Apply on a reset
			AtMaintenanceWindowStart	Apply during a maintenance window as specified by an administrator.
			InMaintenanceWindowOnReset	Apply after a reset but within maintenance window as specified by an administrator.
MaintenanceWindowStartTime	String	False	This represents the start time of Maintenance window.	

Note: There are four Supported values are available in redfish schema. But we support only two operations (Immediate, AtMaintenanceWindowStart).

13 OpenAPI Conformance

13.1 Introduction

OpenAPI is a framework for defining RESTful APIs. Implementers can create a RESTful API definition in a YAML or JSON file

OpenAPI Specification (formerly Swagger Specification) is an API description format for REST APIs. An OpenAPI file allows you to describe your entire API, including:

- Available endpoints (/users) and operations on each endpoint (GET /users, POST /users)
- Operation parameters Input and output for each operation
- Authentication methods
- Contact information, license, terms of use and other information.

The complete OpenAPI Specification can be found on GitHub: [OpenAPI 3.0 Specification](#)
Redfish mandates OpenAPI Specification 3.0 support from 1.6.0 onwards.

13.2 Not Supported URI's under RTP 1.8

- Composition and ResourceBlock related URI's
- Fabrics
- Jobservice

13.3 Not Supported URI's under RTP 1.7

- Certificate related URI's
- Composition and ResourceBlock related URI's
- Sensors under Chassis
- Assembly related URI's
- Fabrics
- Jobservice

13.4 URI's deviated from OpenAPI in RTP 1.5

- PCIe functions is changed from Functions to PCIeFunctions.
- MemoryMetrics is changed from Metrics to MemoryMetrics.

Note: We are not considering Composability and ResourceBlock URI's as of now.

14 RADIUS Authentication

The link to configure RADIUS server from Redfish will come under the ExternalAccountProviders

14.1 RADIUS settings

14.1.1 GET

14.1.1.1 Request

https://{{ip}}/redfish/v1/AccountService/ExternalAccountProviders/RADIUS

Content-Type: application/json

Table 187 RADIUS settings properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
ServiceAddress	String	false	This property shall contain the IPv4/IPv6 address assigned to the RADIUS server.
ServicePort	String	false	This property shall contain the port on which RADIUS Server is running. Note: Default port is 1812.
ServiceEnabled	Boolean	false	The value of this property shall be a boolean indicating whether this service is enabled
Secret	String	false	This property shall contain the text string that serves as a password between hosts. Note: This property will be displayed as null always.

ExtendedPrivilege	Object	false	This object shall contain details of the extended privileges allowed for RADIUS users.			
			Name	Type	Read only	Description
			KVMAccess	Boolean	false	The value of this property shall be a boolean indicating the KVM access to the RADIUS user.
			VMediaAccess	Boolean	false	The value of this property shall be a boolean indicating the VMedia access to the RADIUS
AdvancedRADIUSSetting	Object	True	A reference to the resource AdvancedRADIUSSetting. Note: This property is shown only if the RADIUS server is configured.			
Timeout	Integer	True	Default timeout in seconds for RADIUS Authentication.			

Sample GET Response Body when the RADIUS server is not configured:

```
{
  "@odata.context": "/redfish/v1/$metadata#ExternalAccountProvider.ExternalAccountProvider",
  "@odata.etag": "\"1584337147\"",
  "@odata.id": "/redfish/v1/AccountService/ExternalAccountProviders/RADIUS",
  "@odata.type": "#ExternalAccountProvider.v1_1_2.ExternalAccountProvider",
  "AuthenticationType": "OEM",
  "Description": "RADIUS server settings",
  "Id": "RADIUS Server",
  "Name": "RADIUS Settings",
  "Oem":
  {
    "Ami":
    {
```



```

    "@odata.type":
    "#AMIExternalAccountProvider.v1_0_0.AMIExternalAccountProvider",
    "ExtendedPrivilege":
    {
        "KVMAccess": false,
        "VMediaAccess": false
    },
    "Secret": null,
    "ServiceAddress": null,
    "ServicePort": 1812,
    "Timeout": null
  }
},
"ServiceEnabled": false
}

```

Sample GET Response Body when the RADIUS server is configured:

```

{
  "@odata.context": "/redfish/v1/
  $metadata#ExternalAccountProvider.ExternalAccountProvider",
  "@odata.etag": "\"1584337147\"",
  "@odata.id": "/redfish/v1/AccountService/ExternalAccountProviders/RADIUS",
  "@odata.type": "#ExternalAccountProvider.v1_1_2.ExternalAccountProvider",
  "AuthenticationType": "OEM",
  "Description": "RADIUS server settings",
  "Id": "RADIUS Server",
  "Name": "RADIUS Settings",
  "Oem":
  {
    "Ami":
    {

```

```

"@odata.type":
"#AMIEExternalAccountProvider.v1_0_0.AMIEExternalAccountProvider",
"AdvancedRADIUSSettings":
{
  "@odata.id": "/redfish/v1/AccountService/ExternalAccountProviders/
RADIUS/Oem/Ami/AdvancedRADIUSSetting"
},
"ExtendedPrivilege":
{
  "KVMAccess": true,
  "VMediaAccess": true
},
"Secret": null,
"ServiceAddress": "10.0.122.57",
"ServicePort": 1812,
"Timeout": 3
}
},
"ServiceEnabled": "true"
}

```

14.1.2 PATCH

14.1.2.1 Request

PATCH <https://{{ip}}/redfish/v1/Managers/Self/Oem/Ami/RADIUS>

Content-Type: application/json

Request Body

Example PATCH Request Body:

```

{
  "Oem":
  {

```

```

    "Ami":
    {
        "ExtendedPrivilege":
        {
            "KVMAccess": false,
            "VMediaAccess": false
        },
        "Secret": "testing123",
        "ServiceAddress": "10.0.125.48",
        "ServicePort": 1812
    }
},
"ServiceEnabled": true
}

```

14.1.2.2 Response

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

14.2 AdvancedRADIUSSetting

14.2.1 GET

14.2.1.1 Request

https://{{ip}}/redfish/v1/AccountService/ExternalAccountProviders/RADIUS/Oem/Ami/AdvancedRADIUSSetting

Content-Type: application/json

Table 188 AdvancedRADIUSSettings properties

Name	Type	Read Only	Description
------	------	-----------	-------------

@odata.context	String	True	Refer Section 3.1			
@odata.id	String	True	Refer Section 3.1			
@odata.type	String	True	Refer Section 3.1			
@odata.etag	String	True	Refer Section 3.1			
RADIUSAuth orization	Object	false	This object shall contain details of the Privilege levels and accosciated values for RADIUS users.			
			Name	Type	Read only	Description
			Administrator	String	false	The value of this property shall be a name for the Administrator Privilege in RADIUS server and BMC
			Operator	String	false	The value of this property shall be a name for the Operator Privilege in RADIUS server and BMC.
			User	String	false	The value of this property shall be a name for the User Privilege in RADIUS server and BMC.
			Oem	String	false	The value of this property shall be a name for the Oem Privilege in RADIUS server and BMC.
			NoAccess	String	false	The value of this property shall be a name for the no access Privilege in RADIUS server and BMC.

Sample GET Response Body of AdvancedRADIUSSettings:

```
{
  "@odata.context":
  "/redfish/v1/$metadata#AdvanceRADIUSSetting.AdvanceRADIUSSetting",
```



```

"@odata.etag": "\"1584351508\"",
"@odata.id": "/redfish/v1/AccountService/ExternalAccountProviders/
RADIUS/Oem/Ami/AdvancedRADIUSSetting",
"@odata.type": "#AdvanceRADIUSSetting.v1_0_0.AdvanceRADIUSSetting",
"RADIUSAuthorization":
{
    "Administrator": "H=4",
    "NoAccess": "H=0",
    "Oem": "H=1",
    "Operator": "H=3",
    "User": "H=2"
}
}

```

14.2.2 PATCH

14.2.2.1 Request

PATCH <https://{{ip}}/redfish/v1/AccountService/ExternalAccountProviders/RADIUS/Oem/Ami/AdvancedRADIUSSetting>

Content-Type: application/json

Request Body

Example PATCH Request Body:

```

{
  "RADIUSAuthorization":
  {
    "Administrator": "H=4",
    "NoAccess": "H=0",
    "Oem": "H=1",
    "Operator": "H=3",
    "User": "H=2"
  }
}

```

```
}
```

14.2.2.2 *Response*

The response status is 204 with no body. For Error Responses refer [Section 2.8.2](#) and [Section 2.8.3](#).

15 Known Limitations

15.1 NULL Value

Null value for a given property in Redfish signifies that the property is supported by the Redfish Service but does not contain any value currently.

The following sub sections explains the Responses if null value is provided in PATCH,POST requests and the conditions for displaying properties with null values in GET Responses.

15.1.1 PATCH Requests

Property with “null” value in whe PATCH request will be throwing PropettyValueTypeError except for the following properties :-

- ISCSIBoot properties under NetworkDeviceFunctions instance.
- "CertificateAuthorityUrl" property “/redfish/v1/configurations” AMI OEM URI.

15.1.2 POST Requests

- Mandatory Property with ”null” value in the POST Request Body will be considered as nil value and ActionParameterMissing error with be thrown.
- Non Mandatory Property with “null” value in the POST Request Body will be considered as nil value and ignored.

15.1.3 GET Responses

- Property with “null” value and patch supported will be displayed in the GET response with null value.
- Property with “null” value and patch not supported will not be displayed in the GET response.

15.2 GET Request BODY

Lighttpd is the master web server which receives request and proxy to Redfish and other services as needed. Lighttpd has a known limitation of not accepting body in GET request

15.3 OData Limitations

15.3.1 \$expand

If the response of \$expand exceeds the limit of storage, 100 KB, the server will return HTTP status code 507.

15.3.2 \$select and \$expand

When using \$select with \$expand, the server may return HTTP Status code 507 depending on the levels of \$expand. In our architecture, the precedence of \$expand is higher than \$select. We will apply the \$expand option to get a response by its levels and temporarily save that data, then apply the \$select option to return a subset of the properties. Therefore if the response of \$expand exceeds the limit of storage, the server will return HTTP status code 507, even if the response after applying the \$select option doesn't exceed that limit.

15.4 Time Bounded Operations

All time bounded operations may induce a small deviation upto 10 seconds. This is a architecture limitation of Redfish.

15.5 UploadFirmwareImage Limitation

15.5.1 Credential Checking Timing

Lighttpd is as a reverse proxy server for the Redfish server. Redfish Server receives the request body at that time after Lighttpd has received it completely.

Therefore, It's impossible to check the credential in the Redfish Server before Lighttpd. It also may take a long time to wait for the Lighttpd finish if doing an upload, because the request body also contains upload file if doing an upload.

15.5.2 Upload Size Limit

The upload size limit is aviliable space of /tmp, and it's dynamically updated by a subagent.

If the upload image size exceeds the upload size limit, the server will return 413 Request Entity Too Large status code.

15.6 EventLogs and Event_Receiver

EventLogs will be shown in Manager LogService based on EventLog created by Patch, Post or Delete Operation

EventReceiver will notify the event to the Destination server which is created using subscription.

Both EventLogs and EventReceiver is independent feature.

15.7 Host Interface based System Inventory Population

Important: Host Interface-based System Inventory will not be populated in SPX-13.0 RTP 1.8 release as LAN over USB is not enabled.

15.8 Virtual Media Features

Important: Virtual Media features in Redfish will not be available as Virtual Media is not enabled in SPX-13.0 RTP 1.8 release.

16 Appendix

16.1 Privilege

16.1.1 Privilege Registry

These registries contain a mapping of the resources within the Redfish Service and which privileges are allowed to perform the specified operations against those resource. This information allows a client to determine which roles should have specific privileges and thus map accounts to those roles to perform the desired operations on Redfish Resources.

Almost all standard entities have their corresponding privilege definition in the Privilege Registry. For the entity that is not defined in the Privilege Registry, the default privilege is Login.

16.1.2 OEM Privilege

The AMI predefined OEM privileges are listed below. If there is a need to add additional OEM privilege, please refer to the “MegaRAC Redfish -How to Add OEM extensions” document.

Table 189 OEM URIs

Action URL	Privilege Enforced
PATCH Configurations	ConfigureComponents

Table 190 OEM Action URIs

URI Description	URLs	Required Privilege
AMIManager.RedfishDBReset	/redfish/v1/Managers/Self/Actions/Oem/AMIManager.RedfishDBReset	ConfigureManager
AMICertificate.UploadLDAPCertificates	/redfish/v1/Managers/Self/Actions/Oem/Ami/AMICertificate.UploadLDAPCertificates	ConfigureManager
AMIVirtualMedia.ConfigureCDInstance	/redfish/v1/Managers/Self/Actions/Oem/AMIVirtualMedia.ConfigureCDInstance	ConfigureManager

AMIVirtualMedia.EnableRMedia	/redfish/v1/Managers/Self/Actions/Oem/AMIVirtualMedia.EnableRMedia	ConfigureManager
DRELogService.ClearLog	/redfish/v1/DynamicExtension/LogServices/([^/]+)/Actions/LogService.ClearLog	ConfigureComponents
AmiOemBMCUpdate	/redfish/v1/UpdateService/Actions/AmiOemBMCUpdate	ConfigureManager
UpdateService.UploadFirmwareImage	/redfish/v1/UpdateService/Actions/Oem/UpdateService.UploadFirmwareImage	ConfigureManager
UpdateService.UploadCABundle	/redfish/v1/UpdateService/Actions/Oem/UpdateService.UploadCABundle	ConfigureManager
UpdateService.MultipartHttpPushUri	/redfish/v1/UpdateService/upload	ConfigureManager

16.2 EventService Notification Examples

AMI Redfish Event Subscription can be subscribed by specifying RegistryPrefixes, ResourceTypes and EventFormatType property to filter event to any Event Destination.

Refer [Section 3.40.2](#) POST EventSubscriptionCollection.

- RegistryPrefixes
- ResourceTypes
- EventFormatType

16.2.1 RegistryPrefixes

RegistryPrefixes Property will contain list of prefixes for the Message Registries. This Property acts like a filter only when sending message to the subscriber if the RegistryPrefixes in the Subscription matches with the MessageId in the generated Event. If RegistryPrefixes is empty or absent on subscription, the service shall send events with MessageIds from any Message Registry.

Note:

“EventLog” RegistryPrefixes can be checked using realtime examples of which is given below.

Events triggering with the rest of the RegistryPrefixes like “Base”, “Security”, “SyncAgent”, “HttpStatus” and “IPMI” can be checked using “SubmitTestEvent” given in section 3.39.3.1.

16.2.1.1 EventLog

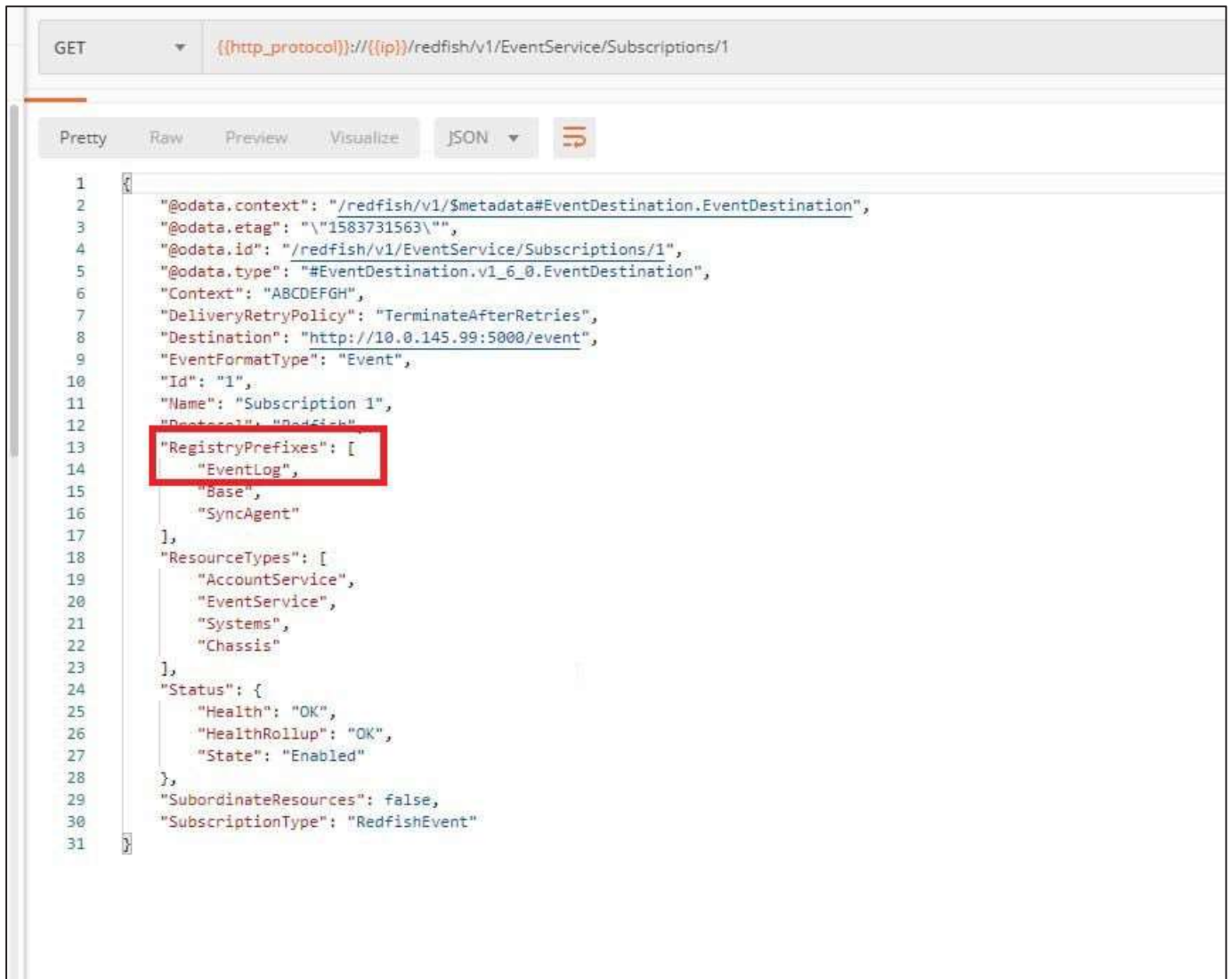
Any Resource created, Resource updated or Resource destroyed will trigger an events in Event Destination with EventLog RegistryPrefixes. Except Event Subscription creation and Event Subscription deletion.

Examples:

1. Resource Creation - Accounts

Step 1: Check EventSubscription Instance for allowable RegistryPrefixes

https://{{ip}}/redfish/v1/EventService/Subscriptions/{{EventSubscription_Instance}}



Step 2: Issue a POST for Account Creation

Request

POST https://{{ip}}/redfish/v1/AccountService/Accounts

Content-Type: application/json

Body:

```
{
  "Name": "Test User Account",
  "Description": "Test User Account",
  "Enabled": true,
  "Password": "superuser",
  "UserName": "user_account",
  "RoleId": "Operator",
  "Locked": false
}
```

Step 3: Check in Event Destination

```
*****-Receiving POST Data-*****
Event_Notice_7
POST Data:
{"@odata.context":"/redfish/v1/$metadata#Event.Event", "@odata.type": "#Event.v1_2_1.Event", "Context": "Event_Sub", "Events": [{"Context":
"Event_Sub", "EventId": "/redfish/v1/AccountService/Accounts/4 - 1566545193", "EventTimestamp": "2019-08-23T03:26:33-05:00", "MemberId": "/
redfish/v1/AccountService/Accounts/4 - 1566545193", "Message": "The resource at /redfish/v1/AccountService/Accounts/4 was successfully
added.", "MessageArgs": ["/redfish/v1/AccountService/Accounts/4"] "MessageId": "EventLog.1.0.0.ResourceAdded" "OriginOfCondition": {"@oda
ta.id": "/redfish/v1/AccountService/Accounts"}, "Severity": "OK"}], "Events@odata.count": 1, "Id": "24", "Name": "Event Array"}

POST Headers:
{"user-agent": "LuaSocket 3.0-rc1", "te": "trailers", "content-length": "650", "connection": "close, TE", "content-type": "application/json", "
host": "10.0.125.169"}

"./post_data.json" opened successfully!
post2docker() error - problem with request: connect ECONNREFUSED 127.0.0.1:13000
Write post data to "./post_data.json" closed successfully.
Write "./post_data.json" successfully.
```

2. Resource Updation - Accounts

Step 1: Issue a PATCH for Accounts Modification

Request

PATCH https://{{ip}}/redfish/v1/AccountService/Accounts/{{Account_Instance}}

Content-Type: application/json

Body:

```
{  
  "UserName": "test_user",  
}
```

Step 2: Check in Event Destination

```
*****-Receiving POST Data-*****  
Event_Notice_1  
POST Data:  
{"@odata.context":"/redfish/v1/$metadata#Event.Event", "@odata.type": "#Event.v1_4_1.Event", "Context": "ABCDEFGH", "Events": [{"Co  
ntext": "ABCDEFGH", "EventId": "/redfish/v1/AccountService/Accounts/6", "EventTimestamp": "2020-03-13T09:02:44-05:00", "MemberId": "  
/redfish/v1/AccountService/Accounts/6", "Message": "The value of attribute UserName at /redfish/v1/AccountService/Accounts/6 wa  
s successfully updated from testuser to test_user.", "Message Args": ["UserName", "/redfish/v1/AccountService/Accounts/6", "testus  
er", "test_user"], "MessageId": "EventLog.1.0.ResourceUpdated", "OriginOfCondition": {"@odata.id": "/redfish/v1/AccountService/Acco  
unts/6"}, "Severity": "OK"}], "Events@odata.count": 1, "Id": "3", "Name": "Event Array"}  
  
POST Headers:  
{ "user-agent": "LuaSocket 3.0-rc1", "te": "trailers", "content-length": "705", "connection": "close, TE", "content-type": "application  
/json", "host": "10.0.125.48" }  
  
"./post_data.json" opened successfully!  
post2docker() error - problem with request: connect ECONNREFUSED 127.0.0.1:13000  
Write "./post_data.json" successfully.  
Write post data to "./post_data.json" closed successfully.  
█
```

3. Resource Deletion - Accounts

Step 1: Issue a DELETE for Account Deletion

Request

DELETE https://{{ip}}/redfish/v1/AccountService/Accounts/{{Account_Instance}}

Content-Type: application/json

Body: none

Step 2: Check in Event Destination



```

*****-Receiving POST Data-*****
Event_Notice_1
POST Data:
{"@odata.context":"/redfish/v1/$metadata#Event.Event","@odata.type":"#Event.v1_4_1.Event","Context":"ABCDEFGH","Events":[{"Co
1584104114","EventTimestamp":"2020-03-13T08:55:14-05:00","MemberId":"/redfish/v1/AccountService/Accounts/5","Mes
essfully removed.","MessageArgs":["/redfish/v1/AccountService/Accounts/5"] "MessageId":"EventLog.1.0.ResourceRemoved" "Origin
erity":"OK"}],"Events@odata.count":1,"Id":"1","Name":"Event Array"}

POST Headers:
{"user-agent":"LuaSocket 3.0-rc1","te":"trailers","content-length":"649","connection":"close, TE","content-type":"application

"./post_data.json" opened successfully!
post2docker() error - problem with request: connect ECONNREFUSED 127.0.0.1:13000
Write post data to "./post_data.json" closed successfully.
Write "./post_data.json" successfully.

```

16.2.2 ResourceTypes

ResourceTypes property will contain list of ResourceTypes that the service provides events on which the subscription can use in the ResourceTypes property of the Event Destination. This Property acts like a filter only when sending message to the subscriber if the ResourceTypes in the Subscription matches the ResourceType of the OriginOfCondition in the generated Event. If ResourceTypes is empty or absent on subscription, the subscriber can receive message from any resource.

Any HTTP Modification Requests on the Resources like Systems, Managers, TelemetryService, AccountService, EventService or Chassis will trigger an event to the Event Destination.

One such example with Chassis as ResourceType is given below

16.2.2.1 AccountService

Events generated from AccountService or any resources inside AccountService will trigger an events in Event Destination. i.e Resource Created or Resource Updated or Resource deleted inside AccountService will send an event to subscribed destination. One such example is given below:-

Step 1: Check EventSubscription Instance for allowable ResourceTypes

https://{{ip}}/redfish/v1/EventService/Subscriptions/{{EventSubscription_Instance}}

GET `://{http_protocol}://{ip}/redfish/v1/EventService/Subscriptions/1`

KEY	VALUE
Key	Value

Body Cookies Headers (13) Test Results

Pretty Raw Preview Visualize JSON

```

1  {
2    "@odata.context": "/redfish/v1/$metadata#EventDestination.EventDestination",
3    "@odata.etag": "\"1584104093\"",
4    "@odata.id": "/redfish/v1/EventService/Subscriptions/1",
5    "@odata.type": "#EventDestination.v1_6_0.EventDestination",
6    "Context": "ABCDEFGH",
7    "DeliveryRetryPolicy": "TerminateAfterRetries",
8    "Destination": "http://10.0.125.48:5000/event",
9    "EventFormatType": "Event",
10   "Id": "1",
11   "Name": "Subscription 1",
12   "Protocol": "Redfish",
13   "RegistryPrefixes": [
14     "EventLog",
15     "Base",
16     "SyncAgent",
17     "IPMI",
18     "HttpStatus",
19     "Security"
20   ],
21   "ResourceTypes": [
22     "AccountService",
23     "EventService",
24     "Systems"
25   ],
26   "Status": {
27     "Health": "OK",
28     "HealthRollup": "OK",
29     "State": "Enabled"
30   },
31   "SubordinateResources": false,
32   "SubscriptionType": "RedfishEvent"
33 }
34

```

Step 2: Issue a Patch on AccountService Instance

Request

PATCH `https://{ip}/redfish/v1/AccountService`

Content-Type: application/json

Body:

```

{
  "ServiceEnabled": true
}

```

}

Step 3: Check in Event Destination

```

*****-Receiving POST Data-*****
Event Notice_4
POST Data:
{"@odata.context":"/redfish/v1/$metadata#Event.Event","@odata.type":"#Event.v1_4_1.Event","Context":"ABCDEFGH","Events":[{"Co
ntext":"ABCDEFGH","EventId":"/redfish/v1/AccountService","EventTimestamp":"2020-03-13T09:35:00-05:00","MemberId":"/redfish/v1
/AccountService","Message":"The value of attribute ServiceEnabled at /redfish/v1/AccountService was successfully updated from
true to true","MessageId":"EventLog.1.0.ResourceUpdated","OriginOfCondition":{"@odata.id":"/redfish/v1/AccountService"},"Severity":"OK"}],"Events@odata.count":1,"Id":"5","Name":"Event Array"}

POST Headers:
{"user-agent":"LuaSocket 3.0-rc1","te":"trailers","content-length":"644","connection":"close, TE","content-type":"application
/json","host":"10.0.125.48"}

"./post_data.json" opened successfully!
post2docker() error - problem with request: connect ECONNREFUSED 127.0.0.1:13000
Write "./post_data.json" successfully.
Write post data to "./post_data.json" closed successfully.

```

16.2.3 EventFormatType

EventFormatType describes the ResourceType (Schema) of the payload (JSON body) sent to the EventDestination.

EventFormatType can be specified in the subscription as well. If this Property is not present, the EventFormatType shall be assumed to be Event.

Only two type of EventFormatType is allowed:-

- Event (By Default)
- MetricReport

16.2.3.1 Event

It is a normal Event, the subscription destination will receive JSON bodies of the Resource Type Event.

1. Check EventSubscription Instance https://{{ip}}/redfish/v1/EventService/Subscription/{{Sub_Instance}}

GET `{{http_protocol}}://{{ip}}/redfish/v1/EventService/Subscriptions/2`

Params Authorization Headers (9) Body Pre-request Script Tests Settings

Query Params

KEY	VALUE
Key	Value

Body Cookies Headers (13) Test Results

Pretty Raw Preview Visualize JSON

```

1  {
2    "@odata.context": "/redfish/v1/$metadata#EventDestination.EventDestination",
3    "@odata.etag": "\"1583732099\"",
4    "@odata.id": "/redfish/v1/EventService/Subscriptions/2",
5    "@odata.type": "#EventDestination.v1_6_0.EventDestination",
6    "Context": "ABCDEFGH",
7    "DeliveryRetryPolicy": "TerminateAfterRetries",
8    "Destination": "http://10.0.113.40:5000/event",
9    "EventFormatType": "Event",
10   "Id": "2"
11   "Name": "Subscription 2",
12   "Protocol": "Redfish",
13   "RegistryPrefixes": [
14     "EventLog",
15     "Base",
16     "SyncAgent"
17   ],
18   "ResourceTypes": [
19     "AccountService",
20     "EventService",
21     "Systems",
22     "Chassis"
23   ],
24   "Status": {
25     "Health": "OK",
26     "HealthRollup": "OK",
27     "State": "Enabled"
28   },
29   "SubordinateResources": false,
30   "SubscriptionType": "RedfishEvent"
31 }

```

2. Follow Step 2 in ResourceType in EventService Notification Example.
3. Check in Event Destination EventFormatType - Event

```

*****-Receiving POST Data.*****
Event Notice_6
POST Data:
{"@odata.context":"/redfish/v1/$metadata#Event.Event", "@odata.type": "#Event.v1_4_1.Event", "Context": "ABCDEFGH", "Events": [{"Context": "ABCDEFGH", "EventId": "/redfish/v1/Chassis/Self", "EventTimestamp": "2020-03-09T01:35:10-05:00", "MemberId": "/redfish/v1/Chassis/Self", "Message": "The value of attribute AssetTag at /redfish/v1/Chassis/Self was updated from 'Free From Asset Tag Test' to 'Free From Asset Tag Testing'", "MessageId": "EventLog.1.0.ResourceUpdated", "OriginOfCondition": {"@odata.id": "/redfish/v1/Chassis/Self", "Severity": "OK"}], "Events@odata.count": 1, "Id": "7", "Name": "Event Array"}
POST Headers:
{"user-agent": "LuaSocket 3.0.rc1", "te": "trailers", "content-length": "768", "connection": "close, TE", "content-type": "application/json", "host": "10.0.125.48"}
"./post_data.json" opened successfully!
post2docker() error - problem with request: connect ECONNREFUSED 127.0.0.1:13800
Write post data to "./post_data.json" closed successfully.
Write "./post_data.json" successfully.

```

16.2.3.2 MetricReport

If it is a MetricReport, then the destination gets MetricReport during the creation or update of the Metric Reports.

1. Check EventSubscription Instance https://{{ip}}/redfish/v1/EventService/Subscription/{{Sub_Instance}}

GET `{{http_protocol}}://{{ip}}/redfish/v1/EventService/Subscriptions/3`

KEY	VALUE
Key	Value

Body Cookies Headers (13) Test Results

Pretty Raw Preview Visualize JSON

```

1  {
2    "@odata.context": "/redfish/v1/$metadata#EventDestination.EventDestination",
3    "@odata.etag": "\"1583732450\"",
4    "@odata.id": "/redfish/v1/EventService/Subscriptions/3",
5    "@odata.type": "#EventDestination.v1_6_0.EventDestination",
6    "Context": "ABCDEFGH",
7    "DeliveryRetryPolicy": "TerminateAfterRetries",
8    "Destination": "http://10.0.115.40:8000/event",
9    "EventFormatType": "MetricReport",
10   "Name": "3",
11   "Name": "Subscription 3",
12   "Protocol": "Redfish",
13   "RegistryPrefixes": [
14     "EventLog",
15     "Base",
16     "SyncAgent"
17   ],
18   "ResourceTypes": [
19     "AccountService",
20     "EventService",
21     "Systems",
22     "Chassis"
23   ],
24   "Status": {
25     "Health": "OK",
26     "HealthRollup": "OK",
27     "State": "Enabled"
28   },
29   "SubordinateResources": false,
30   "SubscriptionType": "RedfishEvent"
31 }

```

2. Post a Metric Report definition.
3. Check in Event Destination EventFormatType-MetricReport

```

*****-Receiving POST Request-*****
Event_Notice_3
POST DATA:
{"@odata.context":"/redfish/v1/$metadata#Event.Event","@odata.type":"#Event.v1_2_1.Event","Context":"Event_Sub_1",
"Events":[{"Context":"Event_Sub_1","EventId":"/redfish/v1/TelemetryService/MetricReportDefinitions/Temp_tsting_new
- 157465544","EventTimestamp":"1974-12-28T08:25:44-04:00","MemberId":"/redfish/v1/TelemetryService/MetricReportDe
finitions/Temp_tsting_new - 157465544","Message":"The resource at /redfish/v1/TelemetryService/MetricReportDefinit
ions/Temp_tsting_new was successfully added.","MessageArgs":["/redfish/v1/TelemetryService/MetricReportDefinitions
/Temp_tsting_new"],"MessageId":"EventLog.1.0.0.ResourceAdded","OriginOfCondition":{"@odata.id":"/redfish/v1/Teleme
tryService/MetricReportDefinitions"},"Severity":"OK"}],"Events@odata.count":1,"Id":"242","Name":"Event Array"}

POST Headers:
{"user-agent":"LuaSocket 3.0-rc1","te":"trailers","content-length":"794","connection":"close, TE","content-type":"
application/json","host":"10.0.125.37"}
"/post_data.json" opened successfully!
post2docker() error - problem with request: connect ECONNREFUSED 127.0.0.1:13000
Write post_data to "/post_data.json" closed successfully.
Write "/post_data.json" successfully.

```

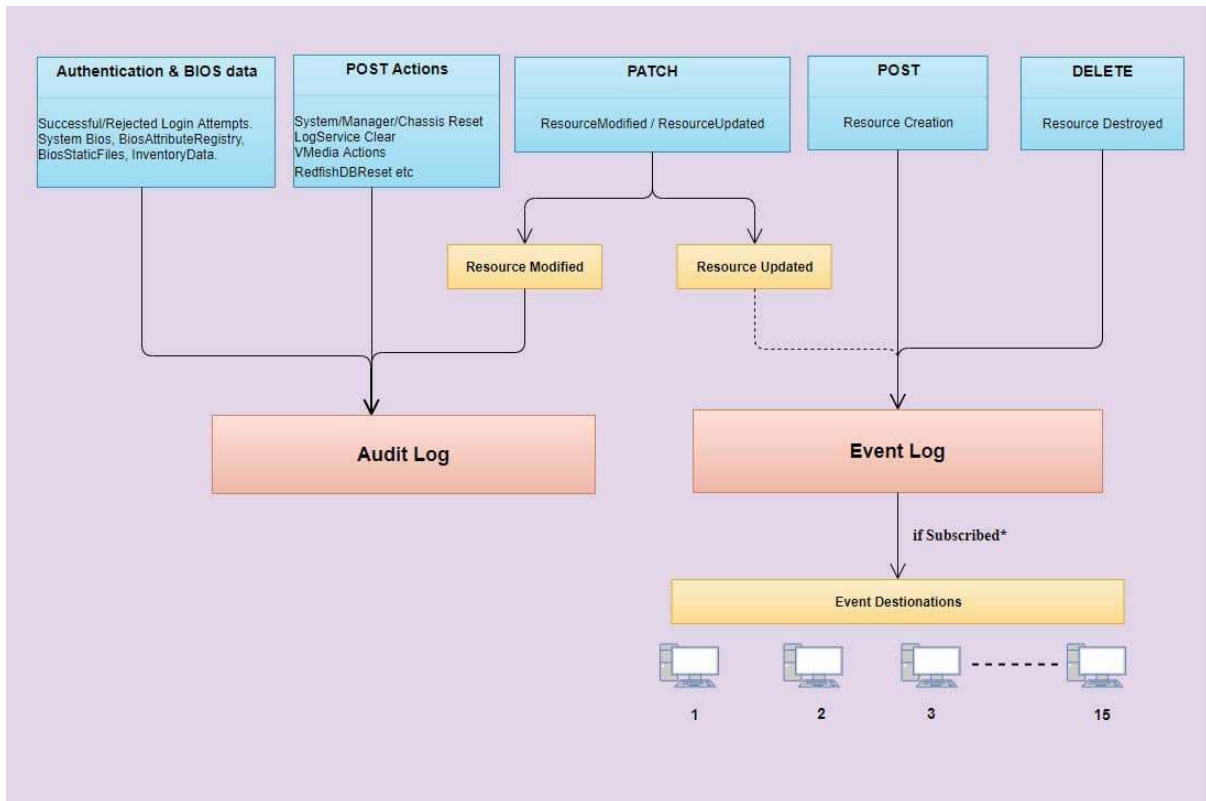
16.3 LogServices

LogServices can be divided into 2 main categories:-

- Redfish Based Logs
 - AuditLog, EventLog (Under Managers Resource)
 - MetricReportLogs (Under Telemetry)

Redfish Based Manager Log Flow Chart





- IPMI Based SEL Logs
 - Systems - BIOS
 - Managers - SEL
 - Chassis - Logs

Note: IPMI SEL Logs include System BIOS Logs, Managers SEL Logs and Chassis Logs (RTP 1.5, RTP1.7 and RTP1.8).

16.3.1 Managers-AuditLog

The following entries will be added in Managers AuditLogs :-

- Any unauthorized usage of the resource based on “AuthFailureLoggingThreshold” property value.
- All Successful HI-NoAuth communication to BMC.
- System Bios, BiosAttributeRegistry, BiosStaticFiles, InventoryData are Posted to BMC.
- All Successful Post Actions except SubmiTestEvent, SubmitTestMetricReport and RedfishDBReset Actions.
- All Successful Patch operations (ResourceModified)

16.3.2 Managers-EventLog

The following entries will be added in Managers EventLogs :-

- All Successful Resource creation (Post Operations).
- All Successful Resource updation (Patch Operations).
- All Successful Resource deletion (Delete Operations).

16.3.3 Telemetry-MetricReportLogs

Telemetry Report Logs are generated whenever the sensor readings of temperature, fan, voltage goes crosses the given threshold value in the MetricReportDefinitions and Triggers provided the value of TriggerActions & ReportActions are given as below.

Note:

Triggers

TriggerActions - Value should be LogToLogService

MetricReportDefinitions

ReportActions - Value should be Log

16.3.4 SEL Mapping Design

IPMI SEL logs are separated into two types and kept under various resources in redfish. They are,

- Managers SEL
- Systems BIOS
- Chassis Logs

The IPMI SEL log following the below condition for category as System/Managers Logs

- As per IPMI Spec If GenericId is 0x01 to 0x1f and Sensor Type can be any of the one in below tables, then Event is Generated from System Software ,So Log will be added in System BIOS Log.
- If GenericId range between 0x21 to 0x3f then Logs will be shown under System SMI LogService.
- If the event is not bios event and sensortype range mentioned in Table 192 Chassis Logs then Logs will be shown under Chassis LogService
- If the event is not bios event and sensortype range mentioned in Table 194 Managers SEL then Logs will be shown under Managers LogService

Table 191 Generic ID

LogServices	GenericID-Code
System BIOS LogService	0x01-0x1f
System SMI LogService	0x21-0x3f

16.3.4.1 Chassis Logs

The following SEL Logs will be displayed under Chassis:-

- Temperature, Fan, Voltage, Current, Physical Intrusion, Power Supply and Power Unit.
- The Sensor Types and its Type Codes which are accepted by Chassis Logs are listed below:

Table 192 Chassis Logs

SensorType	SensorTypeCode
Temperature	01h
Voltage	02h
Current	03h
Fan	04h
Physical Chassis Security	05h
Power Supply /Converter	08h
PowerUnit	09h

16.3.4.2 Systems BIOS

The following SEL Log will be displayed under Systems:-

- System Firmware Error
- The Sensor Type and its Type Code which is accepted by Systems Bios are listed below:

Table 193 System BIOS

SensorType	SensorTypeCode
System Firmware Progress	0Fh

Fan	04h
-----	-----

16.3.4.3 Managers SEL

All other IPMI SEL entries except Systems logs will be displayed under Managers.

- The Sensor Types and its Type Codes which are accepted by Managers SEL are listed below:

Table 194 Managers SEL

SensorType	SensorTypeCode
Temperature	01h
Voltage	02h
Current	03h
Fan	04h
Physical Chassis Security	05h
Platform Security Violation Attempt	06h
Processor	07h
Power Supply /Converter	08h
PowerUnit	09h
CoolingDevice	0Ah
Other Units-based Sensor	0Bh
Memory	0Ch
Drive Slot/Bay	0Dh
POST Memory Resize	0Eh
Event Logging Disabled	10h
Watchdog	11h
System Event	12h
Critical Interrupt	13h
Button/Switch	14h

Module/Board	15h
Microcontroller/Coprocessor	16h
Add-in Card	17h
Chassis	18h
ChipSet	19h
Other FRU	1Ah
Cable/Interconnect	1Bh
Terminator	1Ch
SystemBoot/Restart	1Eh
BaseOSBoot/InstallationStatus	1Fh
OS Stop/Shutdown	20h
Slot/Connector	21h
System ACPI PowerState	22h
Watchdog	23h
Platform Alert	24h
Entity Presence	25h
Monitor ASIC/IC	26h
LAN	27h
Management Subsystem Health	28h
Battery	29h
Session Audit	2Ah
Version Change	2Bh
FRUState	2Ch

16.3.5 Limitations

IPMI supports 3639 SEL Logs, but redfish supports only 300 logs (150 in each) due to SPI Limitation.

Redfish Holds the recently logged SEL entries if it is more than 300 entries in IPMI.

For example:

Assume IPMI contains 1000 SEL logs, in that first 450 entries are Managers SEL, next 300 entries are Chassis Logs and the last 550 entries are Systems BIOS.

In this case, Redfish will hold the SEL entries in the following manner:

Managers SEL - will be holding the recently logged entries i.e, 301 to 450

Chassis Logs - will be holding the recently logged entries i.e, 601 to 750

Systems BIOS - will be holding the recently logged entries i.e, 851 to 1000

16.3.6 Clearing SEL Entries

Refer [Sections 3.18](#) under each subsection Logs.

16.3.7 Deleting single SEL Entry from IPMI

If you delete any single entry from IPMI through IPMItool will gets reflected in appropriate Redfish SEL entries Collection.

Consider the same example provided above, and assume you are deleting 6 logs one after another and the deleted entries are 1, 501, 751, 301, 851 and 951.

Here, the entries 1, 501 and 751 are not available in redfish side, so this doesn't make any sense even if it is deleted from IPMI. But 301, 851 and 951 will gets deleted from redfish.

Note: If you restart the sync-agent, then the IPMI logs will be synced to redfish.

16.3.8 Adding OEM / ODM SEL Logs

OEM/ODM SEL logs would be displayed only when platform/oem specific porting support is added.

Please refer Section 5 How to add SEL OEM Record Handling in "How to Add OEM extensions" document for adding OEM/ODM SEL logs.

16.4 Predefined Roles

Table 195 Predefined Roles

SensorType	SensorTypeCode
Administrator	"Login","ConfigureManager","ConfigureUsers","ConfigureSelf", "ConfigureComponents"
ReadOnly	"Login","ConfigureSelf"
Operator	"Login","ConfigureSelf", "ConfigureComponents"

16.5 Reference documents

- [Redfish Scalable Platforms Management API Specification - DSP0266 1.7.0](#)
- [Redfish Host Interface Specification - DSP0270 1.1.0](#)
- MegaRAC Redfish -How to Add OEM extensions
- MegaRAC Redfish - HostInterface (LanOverUSB)
- MegaRAC Redfish - BMC Hardware Health Management Getting Started Guide
- MegaRAC Redfish - AEP API Doc (v1.7)

17 Reference Schemas

17.1 Event

Table 196 Event Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section 3.1
@odata.id	String	True	Refer Section 3.1
@odata.type	String	True	Refer Section 3.1
@odata.etag	String	True	Refer Section 3.1
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 3.3
Actions	String	True	This object will contain the actions for this resource under Oem property if any.
Context	String	True	A context can be supplied at subscription time. This property is the context value supplied by the subscriber.
Events	Array	True	Each event in this array has a set of properties that describe the event. Since this is an array, more than one event can be sent simultaneously. Note: Refer Table given below.
Events@odata.count	Number	True	An integer representing the number of items in a collection.

Table 197 EventRecord Properties

Name	Type	Read Only	Description
@odata.id	String	True	Refer Section 3.1
Actions	String	True	This object will contain the actions for this resource under Oem property if any.
Context	String	True	A context can be supplied at subscription time. This property is the context value supplied by the subscriber.
EventGroupid	Integer	True	The value of this property shall indicate that events are related and shall have the same value in the case where multiple Event messages are produced by the same root cause. Implementations shall use separate values for events with separate root cause. There shall not be ordering of events implied by the value of this property.
EventId	String	True	The value of this property shall indicate a unique identifier for the event, the format of which is implementation dependent.
EventTimestamp	String	True	The value of this property shall indicate the time the event occurred where the value shall be consistent with the Redfish service time that is also used for the values of the Modified property.
EventType	String	True	Please refer EventTypes under Table Event Subscription Properties.
MemberId	String	True	The value of this string shall uniquely identify the member within the collection.
Message	String	True	This property shall contain an optional human readable message.
MessageArguments	Array	True	This array of message arguments are substituted for the arguments in the message when looked up in the message registry.
MessageId	String	True	This property shall be a key into message registry as described in the Redfish specification.
Oem	Object		Refer Resource Complex Types under Section 3.3 . Note: This property will be a part of JSON response only if an oem property is implemented according to “How to Add OEM extensions” document

OriginOfCondition			The value of this property shall contain a pointer consistent with JSON pointer syntax to the resource that caused the event to be generated.
Severity	String	True	The value of this property shall be the severity of the event, as defined in the Status section of the Redfish specification.