Redfish

Redfish Resource and Schema

User's Manual

UM_AST2600_Redfish_v1_122524

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Document Release History

Release Date	Version	Update Content
December 25, 2024	1.0	Release to public. (Initial version)

Preface

Copyright

Trademarks

Changes

The material in this document is for information purposes only and is subject to change without notice.

Warning

1. A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

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Instruction Symbols

Special attention should be given to the instruction symbols below.

NOTE	This symbol indicates that there is an explanatory or supplementary instruction.
CAUTION	This symbol denotes possible hardware impairment. Upmost precaution must be taken to prevent serious hardware damage.
WARNING	This symbol serves as a warning alert for potential body injury. The user may suffer possible injury from disregard or lack of attention.

Chapter 1. Introduction

The Redfish functionality of AIC's project that uses the **AST2600 BMC chip** is based on the **Redfish 1.15** specification version.
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 allow to utilize the end points using following HTTP methods:-

- GET
- POST
- PATCH
- 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 1.15.1 Specification** and **DSP8010 2019.2** Redfish Schema Base version and the upgraded Schemas are mentioned under **''RTP_v13.5_Feature_URI_Schema_Guide'' Excel**.

Chapter 2. Redfish API

2.1 Redfish API List

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

Table 1 Redfish API List

Resource	Resource URI	Redfish Schema
Service Root	/redfish/v1/	ServiceRoot.v1_7_0.ServiceRoot
Computer System Collection	/redfish/v1/Systems	ComputerSystemCollection.ComputerSystemCollection
Computer System	/redfish/v1/Systems/{{system_instance}} /redfish/v1/Systems/{{system_instance}}/SD	ComputerSystem.v1_16_0.ComputerSystem
BootOption Collection	/redfish/v1/Systems/{{systems_instance}}/BootOptions	BootOptionCollection.BootOptionCollection
BootOption	/redfish/v1/Systems/{{systems_instance}}/BootOptions/{{BootOption_Instacne}} /redfish/v1/Systems/{{systems_instance}}/BootOptions/{{BootOption_Instacne}}/SD	BootOption.v1_0_3.BootOption
Memory Collection	/redfish/v1/Systems/{{system_instance}}/Memory	MemoryCollection.MemoryCollection
Memory	/redfish/v1/Systems/{{system_instance}}/Memory/{{Memory_instance}}	Memory.v1_11_0.Memory
Processor Collection	Collection 1: /redfish/v1/Systems/{{system_instance}}/Processors Collection 2: /redfish/v1/Systems/{{system_instance}}/Processors/{{Proc_Instance}}/SubProcessors /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/Processors	ProcessorCollection.ProcessorCollection
Processor	Instance 1: /redfish/v1/Systems/{{system_instance}}/Processors/{{system_processor_instance}} Instance 2: /redfish/v1/Systems/{{system_instance}}/Processors/{{Proc_Instance}}/SubProcessors/{{SubProc_instance}}	Processor.v1_10_0.Processr

	/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/Processors/{{NetworkAdapter_processor_instance}}	
Ethernet Interface Collection	/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces /redfish/v1/Systems/{{systems_instance}}/EthernetInterfaces	EthernetInterfaceCollection.EthernetInterfaceCollection
Bios	/redfish/v1/Systems/{{system_instance}}/Bios /redfish/v1/Systems/{{system_instance}}/Bios/SD	Bios.v1_2_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_3_0.SimpleStorage
LogServiceCollection	/redfish/v1/Systems/{{system_instance}}/LogServices /redfish/v1/Managers/{{manager_instance}}/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/LogService /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_instance}}/LogServices/{{manager_log_instance}}/Entries /redfish/v1/TelemetryService/LogService/Entries /redfish/v1/Chassis/{{chassis_instance}}/LogServices/{{chassis_log_instance}}/Entries	LogEntryCollection.LogEntryCollection
Log Entry	/redfish/v1/Systems/{{system_instance}}/LogServices/{{system_log_instance}}/Entries/{{system_logentry_instance}} /redfish/v1/Managers/{{manager_instance}}/LogServices/{{manager_log_instance}}/Entries/{{manager_logentry_instance}} /redfish/v1/TelemetryService/LogService/Entries/{{telemetry_logentry_instance}} /redfish/v1/Chassis/{{chassis_instance}}/LogServices/{{chassis_log_instance}}/Entries/{{chassi	LogEntry.v1_12_0.LogEntry

	s_logentry _instance}}	
Systems EthernetInterface	/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/{{system_ethifc_instance}}	EthernetInterface.v1_6_2.EthernetInterface
VLANNetwork InterfaceCollection	/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/{{system_ethifc_instance}}/VLANs /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{network_apadter_instance}}/NetworkDeviceFunctions/{{network_device_function_instance}}/Ethernet/VLANs	VLanNetworkInterfaceCollection.VLanNetworkInterfaceCollection
VLAN Network Interface	/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/{{system_ethifc_instance}}/VLANs/{{system_vlan_instance}} /redfish/v1/Systems/{{system_instance}}/EthernetInterfaces/{{system_ethifc_instance}}/VLANs/{{system_vlan_instance}}/SD /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{network_apadter_instance}}/NetworkDeviceFunctions/{{network_device_function_instance}}/Ethernet/VLANs/{{Vlan_instance}} /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{network_apadter_instance}}/NetworkDeviceFunctions/{{network_device_function_instance}}/Ethernet/VLANs/{{Vlan_instance}}/SD	VLanNetworkInterface.v1_2_0.VLanNetworkInterface
ChassisCollection	/redfish/v1/Chassis	ChassisCollection.ChassisCollection
Chassis	/redfish/v1/Chassis/{{chassis_instance}}	Chassis.v1_15_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
PowerSubSystem	/redfish/v1/Chassis/{{chassis_instance}}/PowerSubSystem	PowerSubsystem.v1_1_0.PowerSubsystem
ThermalSubSystem	/redfish/v1/Chassis/{{chassis_instance}}/ThermalSubSystem	ThermalSubsystem.v1_0_0.ThermalSubsystem
ThermalMetrics	/redfish/v1/Chassis/{{chassis_instance}}/ThermalSubSystem/ThermalMetrics	ThermalMetrics.v1_0_1.ThermalMetrics
Fans Collection	/redfish/v1/Chassis/{{chassis_instance}}/ThermalSubSystem/Fans	FanCollection.FanCollection
Fans	/redfish/v1/Chassis/{{chassis_instance}}/ThermalSubSystem/Fans/{{fan_instance}}	Fan.v1_1_1.Fan
PowerSupplies Collection	/redfish/v1/Chassis/{{chassis_instance}}/PowerSubSystem/PowerSupplies	PowerSupplyCollection.PowerSupplyCollection
PowerSupplies Instance	/redfish/v1/Chassis/{{chassis_instance}}/PowerSubSystem/PowerSupplies/{{powersupplies_instance}}	PowerSupply.v1_3_0.PowerSupply

PowerSupplyMetrics	/redfish/v1/Chassis/{{chassis_instance}}/PowerSubSystem/PowerSupplies/{{powersupplies_instance}}/Metrics	PowerSupplyMetrics.v1_0_1.PowerSupplyMetrics
ManagerCollection	/redfish/v1/Managers	ManagerCollection.ManagerCollection
Manager	/redfish/v1/Managers/{{manager_instance}}	Manager.v1_13_0.Manager
ManagersNetworkProtocol	/redfish/v1/Managers/{{manager_instance}}/NetworkProtocol	ManagerNetworkProtocol.v1_6_0.ManagerNetworkProtocol
SerialInterfaces Collection	/redfish/v1/Managers/{{manager_instance}}/SerialInterfaces	SerialInterfaceCollection.SerialInterfaceCollection
SerialInterfaces	/redfish/v1/Managers/{{manager_instance}}/SerialInterfaces/{{manager_serialifc_instance}}	SerialInterface.v1_1_5.SerialInterface
VirtualMedia Collection	/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_8_0.AccountService
Manager Account Collection	/redfish/v1/AccountService/Accounts	ManagerAccountCollection.ManagerAccountCollection
Manager Account	/redfish/v1/AccountService/Accounts/{{account_instance}}	ManagerAccount.v1_5_0.ManagerAccount
Role Collection	/redfish/v1/AccountService/Roles	RoleCollection.RoleCollection
Role	/redfish/v1/AccountService/Roles/{{role_instance}}	Role.v1_3_0.Role
Event Destination Collection	/redfish/v1/EventService/Subscription	EventDestinationCollection.EventDestinationCollection
Event Destination	/redfish/v1/EventService/Subscriptions/{{Subscriptions_instance}}	EventDestination.v1_7_0.EventDestination
EventService	/redfish/v1/EventService	EventService.v1_5_0.EventService
TaskService	/redfish/v1/TasksService	TaskService.v1_1_4.TaskService
Task Collection	/redfish/v1/TaskService/Tasks	TaskCollection.TaskCollection
Task	/redfish/v1/TaskService/Tasks/{{task_instance}}	Task.v1_4_2.Task
JSON Schema filecollection	/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/{{session_id}}	Session.v1_2_1.Session
MessageRegistry	/redfish/v1/Registries/Base.1.12.0.json	MessageRegistry.v1_5_0.MessageRegistry
MessageRegistry	/redfish/v1/Registries/{{Registry_instance.json}}	MessageRegistry.v1_3_1.MessageRegistry
MessageRegistryFileCollection	/redfish/v1/Registries	MessageRegistryFileCollection.MessageRegistryFileCollection
Message Registry File	/redfish/v1/Registries/{{Registry_instance}}	MessageRegistryFile.v1_1_3.MessageRegistryFile
AttributeRegistry	/redfish/v1/Registries/{{Registry_instance.json}}	AttributeRegistry.v1_3_2.AttributeRegistry
PrivilegeRegistry	/redfish/v1/Registries/{{Registry_instance.json}}	PrivilegeRegistry.v1_1_4.PrivilegeRegistry
NetworkInterfaceCollection	/redfish/v1/Systems/{{system_instance}}/NetworkInterfaces	NetworkInterfaceCollection.NetworkInterfaceCollection
NetworkInterface	/redfish/v1/Systems/{{system_instance}}/NetworkInterfaces/{{NetworkInterface_instance}}	NetworkInterface.v1_2_0.NetworkInterface
NetworkDeviceFunctionCollection	/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{networkadapter_instance}}/NetworkDeviceFunctions /redfish/v1/Systems/{{systems_instance}}/NetworkInterfaces/{{netiface_instance}}/NetworkDeviceFunctions	NetworkDeviceFunctionCollection.NetworkDeviceFunctionCollection
NetworkDeviceFunction	/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}NetworkDeviceFunctions//{{networkDeviceFunctions_instance}} /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}NetworkDeviceFunctions//{{networkDeviceFunctions_instance}}/SD	NetworkDeviceFunction.v1_5_0.NetworkDeviceFunction
NetworkAdapter Collection	/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters	NetworkAdapterCollection.NetworkAdapterCollection
NetworkAdapter	/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{networkadapter_instance}}	NetworkAdapter.v1_8_0.NetworkAdapter
Storage Collection	/redfish/v1/Systems/{{system_instance}}/Storage	StorageCollection.StorageCollection
Storage	/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}	Storage.v1_9_0.Storage
Volume Collection	/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_5_0.Volume
PCIeDevice Collection	/redfish/v1/Chassis/{{chassis_instance}}/PCIeDevices	PCIeDeviceCollection.PCIeDeviceCollection
PCIeDevice	/redfish/v1/Chassis/{{chassis_instance}}/PCIeDevices/{{PCIeDevices_instance}}	PCIeDevice.v1_4_0.PCIeDevice
PCIeFunction Collection	/redfish/v1/Chassis/{{chassis_instance}}/PCIeDevices/{{PCIeDevices_instance}}/PCIeFunctions	PCIeFunctionCollection.PCIeFunctionCollection
PCIeFunction	/redfish/v1/Chassis/{{chassis_instance}}/PCIeDevices/{{PCIeDevices_instance}}/PCIeFunctions/{{PCIeFunctions_instance}}	PCIeFunction.v1_2_3.PCIeFunction
UpdateService	/redfish/v1/UpdateService	UpdateService.v1_6_0.UpdateService
SecureBoot	/redfish/v1/Systems/{{system_instance}}/SecureBoot	SecureBoot.v1_1_0.SecureBoot
Drives	/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}/Drives/{{Drive_instance}}	Drive.v1_13_0.Drive
MemoryDomain Collection	/redfish/v1/Systems/{{system_instance}}/MemoryDomain	MemoryDomainCollection.MemoryDomainCollection
MemoryDomain	/redfish/v1/Systems/{{system_instance}}/MemoryDomain/{{MemoryDomain_Instance}}	MemoryDomain.v1_2_3.MemoryDomain
MemoryChunks Collection	/redfish/v1/Systems/{{system_instance}}/MemoryDomain/{{MemoryDomain_Instance}}/MemoryChunks	MemoryChunksCollection.MemoryChunksCollection
MemoryChunks	/redfish/v1/Systems/{{system_instance}}/MemoryDomain/{{MemoryDomain_Instance}}/MemoryChunks/{{MemoryChunks_Instance}}	MemoryChunks.v1_4_0.MemoryChunks
MemoryMetrics	/redfish/v1/Systems/Self/Memory/{{Memory_instance}}/MemoryMetrics /redfish/v1/Systems/Self/MemorySummary/MemoryMetrics	MemoryMetrics.v1_3_0.MemoryMetrics
ProcessorMetrics	/redfish/v1/Systems/{{system_instance}}/Processors/{{ Processors_instance}}/ProcessorMetrics	ProcessorMetrics.v1_0_2.ProcessorMetrics
PCIeSlots	/redfish/v1/Chassis/{{chassis_instance}}/PCIeSlots	PCIeSlots.v1_1_1.PCIeSlots
AccelerationFunctionCollection	/redfish/v1/Systems/{{system_instance}}/Processors/{{ Processors_instance}}/AccelerationFunctions /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/Processors/{{ NetworkAdapter_processors_instance}}/AccelerationFunctions	AccelerationFunctionCollection.AccelerationFunctionCollection

AccelerationFunction	/redfish/v1/Systems/{{system_instance}}/Processors/{{Processors_instance}}/AccelerationFunctions/{{AccelerationFunction_instance}} /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/Processors/{{Processors_instance}}/AccelerationFunctions/{{AccelerationFunction_instance}}	AccelerationFunction.v1_0_2.AccelerationFunctionCollection
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}}/PCIeDevices/{{PCIeDevice_instance}}/Assembly	Assembly.v1_2_2.Assembly
SensorCollection	/redfish/v1/Chassis/{{chassis_instance}}/Sensors	SensorCollection.SensorCollection
Sensor	/redfish/v1/Chassis/{{chassis_instance}}/Sensors/{{sensor_instance}}	Sensor.v1_0_2.Sensor
SecureBootDatabases Collection	/redfish/v1/Systems/{{systems_instance}}/SecureBoot/SecureBootDatabases	SecureBootDatabaseCollection.SecureBootDatabaseCollection
SecureBootDatabase	/redfish/v1/Systems/{{systems_instance}}/SecureBoot/SecureBootDatabases/{{SBDB_instance}}	SecureBootDatabase.v1_0_0.SecureBootDatabase
SignatureCollection	/redfish/v1/Systems/{{system_instance}}/SecureBoot/SecureBootDatabases/{{secureboot_databases_instance}}/Signatures	SignatureCollection.SignatureCollection
Signature	/redfish/v1/Systems/{{system_instance}}/SecureBoot/SecureBootDatabases/{{secureboot_databases_instance}}/Signatures/{{Signature_instance}}	Signature.v1_0_1. Signature
PortCollection	/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}/Ports	PortCollection.PortCollection

	/redfish/v1/Systems/{{systems_instance}}/GraphicsControllers/{{graphicscontroller_instance}}/Ports /redfish/v1/Systems/{{systems_instance}}/USBControllers/{{usbcontroller_instance}}/Ports	
Port	/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}/Ports/{{Port_instance}} /redfish/v1/Systems/{{systems_instance}}/GraphicsControllers/{{graphicscontroller_instance}}/Ports/{{port_instance}} /redfish/v1/Systems/{{systems_instance}}/USBControllers/{{usbcontroller_instance}}/Ports/{{port_instance}}	Port.v1_5_0.Port
OperatingConfigCollection	/redfish/v1/Systems/{{system_instance}}/Processors/{{Processors_instance}}/OperatingConfigs /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{ NetworkAdapters instance}}/Processors/{{NetworkAdapters_Processors_instance}}/OperatingConfigs	OperatingConfigCollection.OperatingConfigCollection
OperatingConfig	/redfish/v1/Systems/{{system_instance}}/Processors/{{ Processors_instance}}/OperatingConfigs/{{OperatingConfig_instance}} /redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{ NetworkAdaptersinstance}}/Processors/{{NetworkAdapters_Processors_instance}}/OperatingConfigs/{{OperatingConfig_instance}}	OperatingConfig.v1_0_2.OperatingConfig
StorageControllerCollection	/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}/Controllers	StorageControllerCollection.StorageControllerCollection
StorageController	/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}/Controllers/{{Controller_instance}}	StorageController.v1_0_0.OperatingConfig
MediaControllerCollection	/redfish/v1/Chassis/{{chassis_instance}}/MediaControllers	MediaControllerCollection
MediaController	/redfish/v1/Chassis/{{chassis_instance}}/MediaControllers/{{mediacontrollers_instance}}	MediaController.v1_1_0.MediaController
USBControllerCollection	/redfish/v1/Systems/{{systems_instance}}/USBControllers	USBControllerCollection.USBControllerCollection
USBController	/redfish/v1/Systems/{{systems_instance}}/USBControllers/{{USBController_instance}}	USBController.v1_0_0.USBController
GraphicsControllers Collection	/redfish/v1/Systems/{{systems_instance}}/GraphicsControllers	GraphicsControllerCollection.GraphicsControllerCollection
GraphicsController	/redfish/v1/Systems/{{systems_instance}}/Grap	GraphicsController.v1_0_0.GraphicsController

	hicsControllers/{{graphicscontroller_instance}}	
CertificateService	/redfish/v1/CertificateService	CertificateService.v1_0_2.CertificateService
CertificateLocations	/redfish/v1/CertificateService/CertificateLocations	CertificateLocations.v1_0_2.CertificateLocations
CertificateCollection	/redfish/v1/AccountService/Accounts/{{account_instance}}/Certificates /redfish/v1/Managers/{{manager_instance}}/Certificates /redfish/v1/Managers/{{manager_instance}}/NetworkProtocol/HTTPS/Certificates /redfish/v1/Systems/{{system_instance}}/Boot/Certificates /redfish/v1/AccountService/LDAP/Certificates /redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates /redfish/v1/Systems/{{system_instance}}/SecureBoot/SecureBootDatabases/{{database_instance}}/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}} /redfish/v1/AccountService/LDAP/Certificates/1 /redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1 /redfish/v1/Managers/{{manager_instance}}/Certificates/ASD /redfish/v1/Systems/{{system_instance}}/SecureBoot/SecureBootDatabases/{{database_instance}}/Certificates/{{certificate_instance}}	Certificate.v1_4_0.Certificate
ExternalAccountProvider Collection	/redfish/v1/AccountService/ExternalAccountProviders	ExternalAccountProviderCollection.ExternalAccountProviderCollection
ExternalAccountProvider	/redfish/v1/AccountService/ExternalAccountProviders/RADIUS	ExternalAccountProvider.v1_1_2.ExternalAccountProvider
ActionInfo	/redfish/v1/Chassis/{{system_instance}}/ResetActionInfo /redfish/v1/Managers/{{manager_instance}}/ResetActionInfo /redfish/v1/Systems/{{system_instance}}/Reset	ActionInfo.v1_1_2.ActionInfo

	ActionInfo /redfish/v1/Systems/{{system_instance}}/Bios/ChangePasswordActionInfo /redfish/v1/Systems/{{system_instance}}/SecureBoot/ResetKeysActionInfo /redfish/v1/EventService/SubmitTestEventActionInfo /redfish/v1/TelemetryService/SubmitTestMetricReportActionInfo /redfish/v1/UpdateService/SimpleUpdateActionInfo /redfish/v1/Managers/{{manager_instance}}/VirtualMedia/{{virtualmedia_instance}}/EjectMediaActionInfo /redfish/v1/Managers/{{manager_instance}}/VirtualMedia/{{virtualmedia_instance}}/InsertMediaActionInfo /redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/AccountService/LDAP/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/Managers/{ManagerId}/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/Managers/{ManagerId}/NetworkProtocol/HTTPS/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/Managers/{ManagerId}/NetworkProtocol/HTTPS/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/AccountService/LDAP/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/{CertificateId}/Certi	

	ficate.RenewActionInfo /redfish/v1/Managers/{{ManagerId}/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/CertificateService/CertificateService.ReplaceCertificateActionInfo /redfish/v1/CertificateService/CertificateService.GenerateCSRActionInfo /redfish/v1/Chassis/{{chassis_instance}}/PCIeDevices/{{PCIeDevice_instance}}/PCIeFunctions/{{PCIeFunction_instance}}/ChangeStateActionInfo /redfish/v1/Systems/{{system_instance}}/Memory/{{memory_instance}}ChangeStateActionInfo /redfish/v1/UpdateService/UploadCABundleActionInfo /redfish/v1/Managers/{{manager_instance}}/Oem/EnableRMediaActionInfo /redfish/v1/Managers/{{manager_instance}}/Oem/ConfigureCDInstanceActionInfo /redfish/v1/Managers/{{manager_instance}}/Oem/RedfishPowerSaveModeActionInfo /redfish/v1/Managers/{{manager_instance}}/Oem/BackupConfigActionInfo /redfish/v1/Managers/{{manager_instance}}/Oem/RestoreConfigActionInfo	
SoftwareInventoryCollection	/redfish/v1/UpdateService/FirmwareInventory	SoftwareInventoryCollection.SoftwareInventoryCollection
SoftwareInventory	/redfish/v1/UpdateService/FirmwareInventory/{SoftwareInventory_instance}	SoftwareInventory.v1_2_3.SoftwareInventory

Table 2 AMI OEM Extensions

AMI OEM Extensions		
Configurations	/redfish/v1/Oem/Ami/Configurations	AMIConfigurations.v1_0_0.AMIConfigurations
AccountServiceConfigurations	/redfish/v1/AccountService/Oem/Ami/Configurations	AMIAccountServiceConfigurations.v1_0_0.AMIAccountServiceConfigurations
InventoryDataStatus	/redfish/v1/Oem/Ami/InventoryData/Status	AMIInventoryStatus.v1_0_0.AMIInventoryStatus
SystemsBiosTable	/redfish/v1/Systems/{{systems_instance}}/Oem/Ami/BiosTable	AMIBiosTable.v1_0_0.AMIBiosTable
SystemsBiosTableTags	/redfish/v1/Systems/{{systems_instance}}/Oem/Ami/BiosTableTags	AMIBiosTableTags.v1_0_0.AMIBiosTableTags

Systems InventoryCrc	/redfish/v1/Systems/{{system_instances}}/Oem/Ami/Inventory/Crc	InventoryCRC.v1_0_0.InventoryCRC
SMTP Certificates Collection	/redfish/v1/EventService/Oem/Ami/SMTP/Certificates	AMISMTPCertificateCollection.v1_0_0.AMISMTPCertificateCollection
SMTP Certificates	/redfish/v1/EventService/Oem/Ami/SMTP/Certificates/{{Certificate instance}}	AMISMTPCertificate.v1_0_0.AMISMTPCertificate
SNMP Account	/redfish/v1/AccountService/Accounts	AMIManagerAccount.v1_0_0.AMIManagerAccount
AdvancedRADIUSSetting	/redfish/v1/AccountService/ExternalAccountProviders/RADIUS/Oem/Ami/AdvancedRADIUSSetting	AMIAdvanceRADIUSSetting.v1_0_0.AMIAdvanceRADIUSSetting

2.2 Redfish HostInterface API List

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

Table 3 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_3_0.HostInterface
HostEthernetInterface Collection	/redfish/v1/Managers/{{manager_instance}}/HostInterfaces//{{hostinterface_instance}}/HostEthernetInterfaces	EthernetInterfaceCollection.EthernetInterfaceCollection
ManagerEthernetInterface Instance	/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces/{{ethernetinterface_instance}}	EthernetInterface.v1_6_2.EthernetInterface

2.3 Redfish Telemetry API List

Table 4 Redfish Telemetry API List

Resource	Resource URI	Redfish Schema
TelemetryService	/redfish/v1/TelemetryService	TelemetryService.v1_2_1.TelemetryService
MetricDefinitionCollection	/redfish/v1/TelemetryService/MetricDefinitions	MetricDefinitionCollection.MetricDefinitionCollection
MetricDefinition	/redfish/v1/TelemetryService/MetricDefinitions/{{ MetricDefinitions_instance}}	MetricDefinition.v1_0_3.MetricDefinition
Metric Report Definition Collection	/redfish/v1/TelemetryService/MetricReportDefinitions	MetricReportDefinitionCollection.MetricReportDefinitionCollection
Metric Report Definition	/redfish/v1/TelemetryService/MetricReportDefinitions/{{ MetricReportDefinitions_instance}}	MetricReportDefinition.v1_3_0.MetricReportDefinition
Metric Report Collection	/redfish/v1/TelemetryService/MetricReports	MetricReportCollection.MetricReportCollection
Metric Report	/redfish/v1/TelemetryService/MetricReports/{{ MetricReport_instance}}	MetricReport.v1_2_0.MetricReport
Trigger Collection	/redfish/v1/TelemetryService/Triggers	TriggersCollection.TriggersCollection
Trigger	/redfish/v1/TelemetryService/{{Triggers_instance}}	Trigger.v1_1_1.Trigger
Telemetry LogService	/redfish/v1/TelemetryService/LogService	LogService.v1_1_3.LogService
Telemetry LogEntry Collection	/redfish/v1/TelemetryService/LogService/Entries	LogEntryCollection.LogEntryCollection
Telemetry LogEntry	/redfish/v1/TelemetryService/LogService/Entries/{{Entries_instance}}	LogEntry.v1_12_0.LogEntry

2.4 Redfish Composability API List

Table 5 Redfish Composability API List

Resource	Resource URI	Redfish Schema
CompositionService	/redfish/v1/CompositionService	CompositionService.v1_1_2.CompositionService
ResourceBlocks Collection	/redfish/v1/CompositionService/ResourceBlocks	ResourceBlockCollection.ResourceBlockCollection
ResourceBlocks	/redfish/v1/CompositionService/ResourceBlocks/{{ResourceBlock_instance}}	ResourceBlock.v1_3_2.ResourceBlock
ResourceZone Collection	/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_16_0.ComputerSystem

2.5 Responses

This section describes about the response headers, Error codes, and response format.

2.5.1 Response Headers

The response messages specified in this document refers to Redfish 1.15.1 Specification

2.5.2 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 6 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 anoptional 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.

NOTE
While passing empty data in the request body of the POST call, the following error Message ID will be shown in the response. Except ClearLog Action under LogService and EventDestination.ResumeSubscription Action under Subscription.

- POST Actions which require mandatory parameters for execution:
  ‘‘MessageId’’ : ‘‘Base.1.12.0.ActionParameterMissing’’ or
  ‘‘MessageId’’ : ‘‘Base.1.12.0.PropertyMissing’’ or
  ‘‘MessageId’’ : ‘‘Base.1.12.0.EmptyJSON’’
- POST Action which is used for creation of resources:
  ‘‘MessageId’’ : ‘‘Base.1.12.0.CreateFailedMissingReqProperties’’ or
  ‘‘MessageId’’ : ‘‘Base.1.12.0.PropertyMissing’’ or
  ‘‘MessageId’’ : ‘‘Base.1.12.0.EmptyJSON’’

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 and DELETE.

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, 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 on the URL for which it s not supported.

501 Not Implemented

Server does not support the functionality required to fulfill the request.

NOTE
If request method not supported in the lighttpd, it will return 501 directly (Not JSON format).

Request Validation Sequence

1. Check authorization. If not granted, throw 401 ‘‘Base.1.12.AccessDenied’’
2. Check entity privilege. If not granted, throw 403 ‘‘Security.1.0.InsufficientPrivilege’’.
3. Check if the URI exists of not. If it doesn t exists throw 404 ‘‘Base.1.12.0.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.1.12.0.UnrecognizedRequestBody’’.
8. If the request method is PATCH check for precondition header and if header is not present, throw 428 ‘‘Ami.1.0.PreconditionHeaderMissing’’. If header is available validate PreconditionHeader 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.

2.5.3 Status Codes

The status codes of each and every response in tabulated in the chapter 6.5.2 in Redfish 1.15.1 Specification.

Chapter 3. Redfish Resources

This Section explains the Request URI's and JSON Responses for the allowable HTTP methods for each of the Redfish Resources as explained below from Section Collection, Section OData properties explains the OData properties that are common to all the Redfish Entities. Section User Configuration Properties explains the user configurable properties and its reference document for the list. Section Resource, Resource Entity give a brief list of properties which are inherited by all Entities in the Sections given below from 3.4.

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.ServiceRoot",
   "@odata.etag" : "\"1488550735\"",
   "@odata.id" : "/redfish/v1/",
}
```

Table 7 OData Attributes

Name	Type	ReadOnly	Description
@odata.context	String	True	The value of this property shall be the context URL thatdescribes 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 identifierfor 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 1.15.1 under section 6.5 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.

3.2 User Configurable Properties

- Redfish allows the user to specify default values for some properties in the existing Redfish Entities like themaximum 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.

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.

Table 8 Resource Type Definitions

Name	Type	ReadOnly	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: DurableName (String, True) — This indicates the world wide, persistent name of the resource. Name: DurableNameFormat (String, True) — This represents the format of the DurableName property.

All EnumTypes mentioned in this table are of "String" Type.

Table 9 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, ForceRestart will Power ON when system is already OFF
PowerCycle	Power cycle the unit. PowerCycle will Power ON when system is

	already OFF
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 10 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	This property shall represent if this component is available or not and why. Refer Table 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. InTest 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
HealthRollup	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 11 Resource schema properties

Identifier				
Property Name	Type	Read Only	Description	
DurableName	String	True	This property shall contain the world wide unique identifier for the resource.	
DurableName Format	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 **NOTE** North Bound Support only available.
			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. **NOTE** North Bound Support only available.
			UUID	This durable name shall be the hexadecimal representation of the Universal Unique Identifier as defined in the Internation Telecom Union's OSI networking and system aspects - Naming, Addressing and Registration Specification. **NOTE** North Bound Support only available.
			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. **NOTE** North Bound Support only available.
			iQN	This durable name shall be in the iSCSI Qualified Name format as defined in RFC 3720 and RFC 3721 **NOTE** North Bound Support only available.

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 Resource. **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.

<table>
<tr><td rowspan="11">PartLocation</td><td rowspan="11">Object</td><td rowspan="11">True</td><td colspan="4">Postal address of the addressed resource.</td></tr>
<tr><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>LocationOrdinalValue</td><td>number</td><td>true</td><td>The number that represents the location of the part.
If LocationType is slot and this unit is in slot 2 then the LocationOrdinalValue will be 2.</td></tr>
<tr><td rowspan="5">LocationType</td><td rowspan="5">String</td><td rowspan="5">true</td><td colspan="2">The type of location of the part, such as slot, bay, socket and slot.</td></tr>
<tr><td>Enum</td><td>Description</td></tr>
<tr><td>Slot</td><td>Defines a slot as the type of location.</td></tr>
<tr><td>Bay</td><td>Defines a bay as the type of location.</td></tr>
<tr><td>Connector</td><td>Defines a connector as the type of location.</td></tr>
<tr><td>Socket</td><td>Defines a socket as the type of location.</td></tr>
<tr><td rowspan="4">Orientation</td><td rowspan="4">String</td><td rowspan="4">true</td><td colspan="2">The orientation for the ordering of the slot enumeration used by the LocationOrdinalValue property.</td></tr>
<tr><td>Enum</td><td>Description</td></tr>
<tr><td>FrontToBack</td><td>Defines the ordering for the LocationOrdinalValue is front to back.</td></tr>
<tr><td>BackToFront</td><td>Defines the ordering for the LocationOrdinalValue is back to front.</td></tr>
</table>

						TopTo Bottom	Defines the ordering for the LocationOrdinalValue is top to bottom.
						BottomTo Top	Defines the ordering for the LocationOrdinal Value is bottom to top.
						LeftTo Right	Defines the ordering for the LocationOrdinal Value is left to right.
						RightToLeft	Defines the ordering for the LocationOrdinal Value is right to left.
			Reference	String	true	Defines a reference area for the location of the part.	
						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.

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>Right</td><td>Defines the part as being in the right of the unit.</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>Middle</td><td>Defines the part as being in the middle of the unit.</td></tr>
<tr><td></td><td></td><td></td><td>ServiceLabel</td><td>String</td><td>true</td><td colspan="2">The label of the part location, such as a silkscreened name or a printed label</td></tr>
<tr><td rowspan="16">PostalAddress</td><td rowspan="16">Object</td><td rowspan="16">False</td><td colspan="5">A place within the addressed location.</td></tr>
<tr><td>Name</td><td>Type</td><td>Read Only</td><td colspan="2">Description</td></tr>
<tr><td>AdditionalInfo</td><td>String</td><td>false</td><td colspan="2">Area designation or other additional info.</td></tr>
<tr><td>AdditionalCode</td><td>String</td><td>False</td><td colspan="2">The value shall conform the requirements of the ADDCODE field as defined in RFC5139.</td></tr>
<tr><td>Building</td><td>String</td><td>False</td><td colspan="2">Name of the building.</td></tr>
<tr><td>City</td><td>String</td><td>False</td><td colspan="2">City, township, or shi (JP).</td></tr>
<tr><td>Community</td><td>String</td><td>False</td><td colspan="2">Postal community name.</td></tr>
<tr><td>Country</td><td>String</td><td>False</td><td colspan="2">The value shall conform the requirements of the Country field as defined in RFC5139.</td></tr>
<tr><td>District</td><td>String</td><td>False</td><td colspan="2">A county, parish, gun (JP), or district (IN).</td></tr>
<tr><td>Division</td><td>String</td><td>False</td><td colspan="2">City division, borough, dity district, ward, chou (JP).</td></tr>
<tr><td>Floor</td><td>String</td><td>False</td><td colspan="2" rowspan="2">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.</td></tr>
<tr><td>HouseNumber</td><td>String</td><td>False</td></tr>
<tr><td>HouseNumberSuffix</td><td>String</td><td>False</td><td colspan="2">House number suffix.</td></tr>
<tr><td>Landmark</td><td>String</td><td>False</td><td colspan="2">The value shall conform the requirements of the LMK field as defined in RFC5139. It is used to identify a landmark or vanity address.</td></tr>
</table>

			LeadingStreetDirection	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
			AdditionalInfo	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.

			RackOffset Units	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 12 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.

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.

GET

Request

```
https://{{ip}}/redfish/v1/
Content-Type: application/json
```

Response

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

Table 13 Service Root Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource **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 Resource
Name(M)	String	True	Refer Resource
Description	String	True	Provides description of the resource. Refer Resource
UUID	String	True	Refer Resource
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.
ProtocolFeatures Supported	Object	True	Contains information about protocol features supported by the service.

Name	Type	Read only	Description
DeepOperations	Object	True	The information about deep operations that the service supports.

						Refer Table DeepOperations Properties
			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 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 Resource. **NOTE** *It will be present in response if there is an oem Property implemented according to "How to Add OEM extensions" document.*
			Sessions	Object	True	Link to a collection of Sessions

Table 14 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	Number	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 15 DeepOperations Properties

Name	Type	Read Only	Description
ExpandAll	Boolean	True	An indication of whether the service supports the deep PATCH operation.
DeepPOST	Boolean	True	An indication of whether the service supports the deep POST operation.
MaxLevels	Number	True	The maximum levels of resources allowed in deep operations.

Table 16 Oem Object

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="5">Ami</td><td rowspan="5">Object</td><td rowspan="5">True</td><td>Contains information related to AMI features supported by the service.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer ODATA Properties</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>InventoryDataStatus</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 AMI BMC Image in PRJ and for this Link to be visible refer section Redfish Inventory Support for further details o this URI.</td></tr>
<tr><td>RtpVersion</td><td>String</td><td>True</td><td>This indicates the Redfish Technology Pack version.</td></tr>
</table></td></tr>
</table>

3.5 Collection

Table 17 Collection Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer ODATA Properties
@Redfish.CollectionCapabilities	Object	True	Refer Section CollectionCapabilities Annotation **NOTE** *This annotation will be present in Systems Collection "redfish/v1/Systems" and ResourceZone Instance response only.*
@odata.id	String	True	Refer ODATA Properties
@odata.type	String	True	Refer ODATA Properties
@odata.etag	String	True	Refer ODATA Properties
Oem	Object	True	Refer Resource Complex Types under Resource. **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 System API

3.6.1 Computer System Collection

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

GET

Request

```
GET https://{{ip}}/ redfish/v1/Systems
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

POST

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"
}
```

Response

The response status is 201 and the response body is a GET Response with the properties of the newly created ystem. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.6.2 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.

GET

Request

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

Content-Type: application/json

Response

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

Table 18 ComputerSystem Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="4">@Redfish.Settings</td><td rowspan="4">Object</td><td rowspan="4">True</td><td>A Reference to the FutureState URI for this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer ODATA Properties</td></tr>
<tr><td>SettingsObject</td><td>Object</td><td>True</td><td>A Reference to the FutureState URI for this resource.
NOTE
This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information).</td></tr>
</table></td></tr>
<tr><td>@odata.context</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.id</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.etag</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>Refer Table Resource Complex Types under Section Resource</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>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.</td></tr>
<tr><td>Id (M)</td><td>String</td><td>True</td><td>Resource Identifier</td></tr>
<tr><td>Name (M)</td><td>String</td><td>True</td><td>Name of the Resource</td></tr>
<tr><td>Description</td><td>String</td><td>True</td><td>Provides description of the resource. Refer Resource</td></tr>
<tr><td>SystemType</td><td>String</td><td>True</td><td>An enumeration that indicates the kind of system that this resource represents.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Physical</td><td>A computer system</td></tr>
<tr><td>Composed</td><td>A computer system that has been created by binding resource blocks together.</td></tr>
<tr><td>Virtual</td><td>A virtual machine instance running on this system.</td></tr>
<tr><td>OS</td><td>An operating system instance.</td></tr>
<tr><td>PhysicallyPartitioned</td><td>A hardware-based partition of a computer system.</td></tr>
<tr><td>VirtuallyPartitioned</td><td>A virtual or software-based partition of a computer system.</td></tr>
<tr><td>DPU</td><td>A computer system that performs the functions of a data processing unit, such as a SmartNIC.</td></tr>
</table></td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td>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>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>Refer Table Resource Complex Types under Section Resource
NOTE
It will be present in response if there is an oem property implemented according to "How to Add OEM extensions" document</td></tr>
<tr><td>Chassis(N)</td><td>Array</td><td>True</td><td>An array of references to the chassis in which</td></tr>
</table></td></tr>
</table>

						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.
			Managed By@odat a.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.*
			Powered By@odat a.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	False	The user definable tag that can be used to track this computer system for inventory or other client purposes. **NOTE** *This can be populated by Host Interface (Extra Bios Support is needed).*
Manufacturer	String	True	Manufacturer or OEM of this system. Default it will be null value **NOTE** *This can be populated by Host Interface (Extra Bios Support is needed).*
Model	String	True	Model number of this system. Default it will be null value **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 "How to Add OEM extensions" document.* **NOTE** *This can be populated by Host Interface (Extra Bios Support is needed).*
SKU	String	True	The value of this property shall contain the manufacturer Stock Keeping Unit (SKU) for the system. Default it will be null value **NOTE** *This property will be populated by Host Interface, (Extra Bios Support is needed).*
SerialNumber	String	True	The value of this property shall contain the serial number for this system. Default it will be null value **NOTE** *This property will be populated by Host Interface, (Extra Bios Support is needed).*
PartNumber	String	True	Part number for this system as defined by the manufacturer. Default it will be null value **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 "How to Add OEM extensions" document. This can be populated by Host Interface, (Extra Bios Support is needed).*
SubModel	String	True	This property shall contain the information about the sub-model (or config) of the system. This shall not include the model/product name or the

<table>
<tr><td></td><td></td><td></td><td>manufacturer name. Default it will be null value</td></tr>
<tr><td>UUID</td><td>String</td><td>True</td><td>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. Default it will be null value
NOTE
This can be populated by Host Interface (Extra Bios Support is needed).</td></tr>
<tr><td>HostName</td><td>String</td><td>True</td><td>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
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.</td></tr>
<tr><td>IndicatorLED</td><td>String</td><td>False</td><td>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
NOTE
This can be populated by Host Interface (Extra Bios Support is needed).
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Lit</td><td>The Indicator LED is Lit.</td></tr>
<tr><td>Blinking</td><td>The Indicator LED is Blinking.</td></tr>
<tr><td>Off</td><td>The Indicator LED is Off.</td></tr>
</table></td></tr>
<tr><td>PowerState</td><td>String</td><td>True</td><td>The current power state of the system.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>Boot</td><td>Object</td><td>False</td><td>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
This can be populated by Host Interface (Extra Bios Support is needed).</td></tr>
<tr><td>BiosVersion</td><td>String</td><td>True</td><td>The version of the system BIOS or primary system firmware. Default it will be null value</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>NOTE
This can be populated by Host Interface (Extra Bios Support is needed).</td></tr>
<tr><td>ProcessorSummary</td><td></td><td></td><td>This object describes the central processors of the system in general detail.
NOTE
This will be populated by Host Interface (Extra Bios Support is needed).
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>CoreCount</td><td>Number, Null</td><td>True</td><td>This property shall contain the total number of central processor cores in in the system. Default it will be null value
NOTE
Minimum’0’</td></tr>
<tr><td>Count</td><td>Number</td><td>True</td><td>The number of processors in the system. Default it will be null value</td></tr>
<tr><td>Model</td><td>String</td><td>True</td><td>The processor model for the primary or majority of processors in this system. Default it will be null value</td></tr>
<tr><td>Metrics</td><td>Object</td><td>True</td><td>The link to the metrics associated with all processor in this system.
Please refer section ProcessorMetrics.
NOTE
This can be populated by Host Interface (Extra Bios Support is needed).</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Resource Complex Types under Section Resource. Default it will be null value
NOTE
Northbound only support.</td></tr>
</table></td></tr>
<tr><td>MemorySummary</td><td></td><td></td><td>This object describes the central memory of the system in general detail.</td></tr>
</table>

NOTE
This can be populated by Host Interface (Extra Bios Support is needed).

Name	Type	Read Only	Description
TotalSystemMemoryGiB	Number	True	The total installed, operating systemaccessible memory (RAM), measured in GiB. Default it will be null value
Status	Object	True	Refer Resource Complex Types under Section Resource. Default it will be null value **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. Default it will be null value **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, systemaccessible persistent memory, measured in GiB. Default it will be null value

Actions	Object	True	Computer System allows the user to perform Reset Action and it's allowable values are as given in Section Resource. 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 Resource 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.
MemoryDomains(N)	Object	True	The link to be collection of memory domains 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.*

<table>
<tr><td>USBControllers(N)</td><td>Object</td><td>True</td><td>A reference to the collection of USB controller 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.</td></tr>
<tr><td>GraphicsControllers(N)</td><td>Object</td><td>True</td><td>A reference to the collection of Graphics controller 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.</td></tr>
<tr><td>HostingRoles</td><td>Array</td><td>True</td><td>The hosing roles that this computer system supports.
NOTE
At present the default value is ApplicationServer.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>ApplicationServer</td><td>The system hosts functionality that supports general purpose applications.</td></tr>
<tr><td>StorageServer</td><td>The system hosts functionality that supports the system acting as a storage server.</td></tr>
<tr><td>Switch</td><td>The system hosts functionality that supports the system acting as a switch.</td></tr>
</table></td></tr>
<tr><td>HostedServices</td><td>Object</td><td>True</td><td>The services that this computer system supports.
NOTE
At present only Oem property is supported under it. Refer Resource Complex Types under Section Resource.
NOTE
It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document.</td></tr>
<tr><td>PCIeDevices (N)</td><td>Array</td><td>True</td><td>A reference to a collection of PCIe Devices used by this computer system.
NOTE
Links will be available only when Host Interface feature is enabled and the corresponding AMI BIOS Image is used.</td></tr>
</table>

PCIeDevices@odata.count	Number	True	Number of PCIeDevices used by this systems.
PCIeFunctions (N)	Array	True	A reference to a collection of PCIe Functions used by this computer system. **NOTE** *Links will be available only Host Interface feature is enabled and the corresponding AMI BIOS Image is used.*
PCIeFunctions@odata.count	Number	True	Number of PCIeFunctions used by this systems.
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.

Table 19 ComputerSystem - Boot Properties

Name	Type	Read Only	Description
BootOptions	Object	True	A reference to the collection of the UEFI Boot Options associated with this Computer System. **NOTE** *This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information).*
Certificate	Object	True	A link to Collection of Certificates **NOTE** *This property will not shown in /redfish/v1/Systems/Self/SD URI.*
BootNext	String	False	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 User needs to patch this property and BIOS will read it in the next boot and apply provided AMI BIOS is used. **NOTE** *This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information)*
BootSourceOverrideTarget	String	False	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. The allowable values for this property are specified in the following table :- **NOTE** *allowable value will be shown in /redfish/v1/Systems/Self/SD URI*

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	Boot the manufacturer's Utilities program(s). **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.*
Diags	Boot the manufacturer's Diagnostics program.
UefiShell	Boot to the UEFI Shell. **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.*
UefiTarget	Boot to the UEFI Device specified in the UefiTargetBootSourceOverride property **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.*
SDCard	Boot from an SD Card. **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.*
UefiHttp	Boot from a UEFI HTTP network location. **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to*

<table>
<tr><td></td><td></td><td></td><td></td><td>BMC at BIOS Boot.</td></tr>
<tr><td></td><td></td><td></td><td>RemoteDrive</td><td>Boot from a remote drive (e.g. iSCSI).
NOTE
This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</td></tr>
<tr><td></td><td></td><td></td><td>UefiBootNext</td><td>Boot to the UEFI Device specified in the BootNext property.
NOTE
This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.</td></tr>
<tr><td>BootSourceOverrideEnabled</td><td>String</td><td>False</td><td colspan="2">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 Disabled value. Default it will be null value.
The allowable values for this property are specified in the following table :-
NOTE
allowable value will be shown in /redfish/v1/Systems/Self/SD URI
<table><tr><th>Enum</th><th>Description</th></tr><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 resetback to Disabled.</td></tr><tr><td>Continuous</td><td>The system will boot to the target specified in the BootSourceOverrideTarget, when bios reboots or if host restart not happen in 60 seconds then this property will set to Disabled.</td></tr></table></td></tr>
<tr><td>UefiTargetBootSourceOverride</td><td>String</td><td>False</td><td colspan="2">This property shall contain the UEFI device path of the override boot target. Changes to this property do not alter the BIOS persistent boot order configuration.
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.</td></tr>
<tr><td>AliasBootOrder</td><td>Array</td><td>True</td><td colspan="2">Ordered array of boot source aliases representing the persistent Boot Order associated with this computer system.</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>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.</td></tr>
<tr><td>BootOrder</td><td>Array</td><td>False</td><td>Ordered array of BootOptionReference strings representing the persistent Boot Order associated with this computer system.</td></tr>
<tr><td>BootOrderPropertySelection</td><td>String</td><td>True</td><td>The value of this property shall indicate which boot order property the system uses when specifying the persistent boot order. Default it will be null value</td></tr>
<tr><td>HttpBootUri</td><td>String</td><td>False</td><td>This property shall contain the URI to perform an HTTP or HTTPS boot. Default it will be null value</td></tr>
<tr><td>BootSourceOverrideMode</td><td>String</td><td>False</td><td>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. Default it will be null value
The allowable values for this property are specified in the following table :-
NOTE
allowable value will be shown in /redfish/v1/Systems/Self/SD URI
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Legacy</td><td>The system will boot in non-UEFI boot mode to the Boot Source Override Target.</td></tr>
<tr><td>UEFI</td><td>The system will boot in UEFI boot mode to the Boot Source Override Target.</td></tr>
</table></td></tr>
</table>

Table 20 Computersystem – 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 21 Trusted Modules 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 Resource for Resource.Status. **NOTE** *This can be populated by Host Interface (Extra Bios Support is needed).*
Oem	Object		Refer Table Resource Complex Types under Section Resource. **NOTE** *It will be present in response if there is an oem property implemented according to "How to Add OEM extensions" document.*
FirmwareVersion 2	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.

PATCH

Request

```
PATCH https://{{ip}}/redfish/v1/Systems/{{system_instance}}
Content-Type: application/json
```

Response Body

Please refer to the properties that are patchable in Table Computer System Properties for which ReadOnly is False that can be sent as Request body in json format except for Boot Properties which can be patched only with the Systems/{{system_instance}} /SD (the Future Settings URI).

Example PATCH Request Body:

```
{
    "AssetTag" : "Free form asset tag" ,
    "IndicatorLED" : "Off" ,
    "PowerRestorePolicy" : "AlwaysOn"
}
```

Response

The response status is success with status code as 202 with message body. For Error Responses refer "Redfish Error Response" and "Status Codes".

```
{
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "@odata.id": "/redfish/v1/TaskService/Task/1",
    "@odata.type": "#Task.v1_4_2.Task",
    "Description": "Task for Systems – IndicatorLED, PowerRestorePolicy",
    "Id": "1",
    "Name": "Systems – IndicatorLED, PowerRestorePolicy",
    "TaskMonitor": "/redfish/v1/TaskService/TaskMonitors/1",
    "TaskState": "New"
}
```

Asset Tag:

The response status is success with status code as 204 and no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

IndicatorLED and PowerRestorePolicy:

If any one of the Task properties or both present in request body, then for success the response status is 202 with message body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

```
{
   "@odata.context" : "/redfish/v1/$metadata#Task.Task" ,
   "@odata.id" : "/redfish/v1/TaskService/Tasks/1" ,
   "@odata.type" : "#Task.v1_4_2.Task" ,
   "Description" : "Task for Systems IndicatorLED, PowerRestorePolicy" ,
   "Id" : "1" ,
   "Name" : "Systems – IndicatorLED, PowerRestorePolicy" ,
   "TaskMonitor": "/redfish/v1/TaskService/TaskMonitors/1",
   "TaskState" : "New"
}
```

POST

Request

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

```
POSThttps://{{ip}}/redfish/v1/Systems/{{system_instance}} /Actions/ComputerSystem.Reset
Content-Type: application/json
```

Example POST Request Body:

```
{ ResetType : On }
```

Response

For success the response status is 202 with message body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

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

For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.6.3 Systems Instance FutureState (SD)

Displays the information about the Boot Properties.

GET

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/SD
Content-Type: application/json
```

Response

The response of the request will be in JSON format.
The "Boot" property is mentioned in Table Computer System - Boot Properties and other properties "@odata.id/@odata.etag/@odata.context/@odata.type/Description/Id/Name/SystemType" can reference Table Computer System Properties.

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

PATCH

Request

```
PATCH https://{{ip}}/redfish/v1/Systems/{{system_instance}}/SD
Content-Type: application/json
```

Request Body
Please refer to the properties that are patchable in Table Computer System - Boot Properties for which ReadOnly is False that can be sent as Request body in json format.

Example PATCH Request Body:

```
{
   "Boot" : {
      "BootSourceOverrideMode" : "UEFI" ,
      "BootSourceOverrideEnabled" : "Once" ,
      "BootSourceOverrideTarget" : "UefiTarget" ,
      "UefiTargetBootSourceOverride" : "UEFI device path 2"
   }
}
```

NOTE

- *AMI Bios doesn't support Continuous BootSourceOverride for UEFI BootOptions if BootSourceOverrideTarget are "UefiBootNext", "UefiTarget" or "BiosSetup", for example if the user set BootSourceOverrideEnabled to Continuous and BootSourceOverrideTarget to "UefiBootNext", "UefiTarget" or "BiosSetup", AMI Bios will ignore this setting and boot according to the boot priority. AMI Bios Supports Once BootSourceOverride for HttpBootUri.*
- *Patch request for Boot properties will be blocked when FixedBootOrder feature is enabled in BIOS, this is handled using a internal flag which will be populated from Bios.*
- *AssetTag, IndicatorLED Patchable properties in Systems/{{system_instance}} will be considered as unknown properties in Systems/{{system_instance}}/SD.*
- *AMI Bios will ignore in band patch to systems/Self and boot according to the boot priority*

Response

The response status is 204 with no body. For Error Responses refer "Redfish Error Response" and "Status Codes".

3.6.4 BootOption Collection

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

GET

Request

```
https://{{ip}}/redfish/v1/Systems/Self/BootOptions
Content-Type: application/json
```

Response

Please refer Collection for the JSON response properties.

POST

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/BootOptions
Content-Type: application/json
```

Example POST request :

```
{
   "Name" : "Boot Option" ,
   "Description" : "UEFI Boot Option" ,
   "BootOptionReference" : "Boot06" ,
   "DisplayName" : "Windows Boot Manager" ,
   "BootOptionEnabled" : true,
   "UefiDevicePath" :"PciRoot(0x0)/Pci(0x14,0x0)/USB(0x4,0x0)/USB(0x0,0x0)/HD(1,MBR,0x006EC15
D,0x40,0x1DFFFC0)" ,
   "Alias" : "Hdd" ,
   "RelatedItem" : [
      {
         "@odata.id" : "/redfish/v1/Systems/1/SimpleStorage/1"
      }
   ]
}
```

Response

The response status is 201 and the response body is a GET Response with the properties of the newly created BootOptions instance. For Error Responses refer Section "Redfish Error Response" and "Section Status Codes".

3.6.5 BootOption

Displays the information about the BootOptions.

GET

Request

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 22 BootOption Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td rowspan="4">@Redfish.Settings</td><td rowspan="4">Object</td><td rowspan="4">True</td><td>A Reference to the FutureState URI for this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>SettingsObject</td><td>Object</td><td>True</td><td>A Reference to the FutureState URI for this resource.
NOTE
This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information).</td></tr>
</table></td></tr>
<tr><td>@odata.context</td><td>String</td><td>True</td><td>Refer ODATA Properties</td></tr>
<tr><td>@odata.id</td><td>String</td><td>True</td><td>Refer ODATA Properties</td></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer ODATA Properties</td></tr>
<tr><td>@odata.etag</td><td>String</td><td>True</td><td>Refer ODATA Properties</td></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>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.</td></tr>
</table>

Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section Resource
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	String	True	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: Boot the manufacturer's Utilities program(s). **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.* Diags: Boot the manufacturer's Diagnostics program. UefiShell: Boot to the UEFI Shell. **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.* UefiTarget: Boot to the UEFI Device specified in the UefiTargetBootSourceOverride property. **NOTE** *This property is patchable only when BIOS supports Redfish and*

				BIOS should send this property to BMC at BIOS Boot.
			SDCard	Boot from an SD Card. **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.*
			UefiHttp	Boot from a UEFI HTTP network location. **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.*
			RemoteDrive	Boot from a remote drive (e.g. iSCSI). **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.*
			UefiBootNext	Boot to the UEFI Device specified in the BootNext property. **NOTE** *This property is patchable only when BIOS supports Redfish and BIOS should send this property to BMC at BIOS Boot.*

3.6.6 BootOption Future State (SD)

Displays the information about the BootOptions.

GET

Request

```
https://{{ip}}/redfish/v1/Systems/Self/BootOptions/{{BootOptions_instance}}/SD
Content-Type: application/json
```

Response

The response of the request will be in JSON format. The properties are mentioned inTable BootOption Properties.

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

PATCH

Request

```
PATCH
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/BootOptions/{{BootOptions_instance}}/SD
Content-Type: application/json
```

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

Example PATCH Request Body:

```
{
      "BootOptionEnabled" :true
}
```

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

NOTE
Patch request for Boot properties will be blocked when FixedBootOrder feature is enabled in BIOS, this is handled using a internal flag which will be populated from Bios

3.6.7 Memory Collection

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

GET

Request

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

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.6.8 Memory

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

GET

Request

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 23 Memory Properties

Name	Type	Read only	Description
@odata.context	String	True	Refer ODATA Properties
@odata.id	String	True	Refer ODATA Properties
@odata.type	String	True	Refer ODATA Properties
@odata.etag	String	True	Refer ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource

<table>
<tr><td>Actions</td><td>Object</td><td>True</td><td>This object will contain the actions for this resource under Oem property if any.</td></tr>
<tr><td>MemoryType</td><td>String</td><td>True</td><td>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><tr><th>Enum</th><th>Description</th></tr><tr><td>DRAM</td><td>DRAM</td></tr><tr><td>NVDIMM_N</td><td>NVDIMM_N as defined by JEDEC.</td></tr><tr><td>NVDIMM_F</td><td>NVDIMM_F as defined by JEDEC.</td></tr><tr><td>NVDIMM_P</td><td>NVDIMM_P as defined by JEDEC.</td></tr><tr><td>IntelOptane</td><td>The memory module is Intel Optane DC Persistent Memory and composed of a combination of non-volatile and volatile memory.</td></tr></table></td></tr>
<tr><td>MemoryDeviceType</td><td>String</td><td>True</td><td>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”
“HBM”,
“HBM2”,
“HBM3”,
“GDDR”,
“GDDR2”,
“GDDR3”,
“GDDR4”,
“GDDR5”,
“GDDR5X”,
“GDDR6”,</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>“DDR5”,
“OEM”
]</td></tr>
<tr><td>BaseModuleType</td><td>String</td><td>True</td><td>The base module type of Memory.
NOTE
Northbound only properties.
<table><tr><th>Enum</th><th>Description</th></tr><tr><td>RDIMM</td><td>Registered DIMM.</td></tr><tr><td>UDIMM</td><td>UDIMM</td></tr><tr><td>SO_DIMM</td><td>SO_DIMM</td></tr><tr><td>LRDIMM
Mini_RDIMM</td><td>Load Reduced
Mini_RDIMM</td></tr><tr><td>Mini_UDIMM</td><td>Mini_UDIMM</td></tr><tr><td>SO_RDIMM_72b</td><td>SO_RDIMM_72b</td></tr><tr><td>SO_UDIMM_72b</td><td>SO_UDIMM_72b</td></tr><tr><td>SO_DIMM_16b</td><td>SO_DIMM_16b</td></tr><tr><td>SO_DIMM_32b</td><td>SO_DIMM_32b</td></tr><tr><td>Die</td><td>A die within a package</td></tr></table></td></tr>
<tr><td>MemoryMedia</td><td>Array</td><td>True</td><td>Media of this memory.
NOTE
Northbound only properties.
<table><tr><th>Enum</th><th>Description</th></tr><tr><td>DRAM</td><td>DRAM media.</td></tr><tr><td>NAND</td><td>NAND media.</td></tr><tr><td>Intel3DXPoint</td><td>Intel 3D XPoint media.</td></tr><tr><td>Proprietary</td><td>Proprietary media.</td></tr></table></td></tr>
<tr><td>CapacityMiB</td><td>Number</td><td>True</td><td>The value of this property shall be the Memory capacity in MiB</td></tr>
<tr><td>DataWidthBits</td><td>Number</td><td>True</td><td>The value of this property shall be the bus width in bits</td></tr>
<tr><td>BusWidthBits</td><td>Number</td><td>True</td><td>The value of this property shall be the bus width in bits</td></tr>
<tr><td>Manufacturer</td><td>String</td><td>True</td><td>The manufacturer of the Memory.</td></tr>
<tr><td>SerialNumber</td><td>String</td><td>True</td><td>The serial number as provided by the manufacturer of this Memory.</td></tr>
<tr><td>PartNumber</td><td>String</td><td>True</td><td>The part number as provided by the manufacturer of this Memory.</td></tr>
<tr><td>AllowedSpeedsMHz</td><td>Array</td><td>True</td><td>Speed bins supported by this Memory.</td></tr>
<tr><td>Assembly</td><td>Object</td><td>True</td><td>The link to the assembly associated with this DIMM.
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.</td></tr>
<tr><td>FirmwareRevision</td><td>String</td><td>True</td><td>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</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>and gami module should be added.</td></tr>
<tr><td>FirmwareApiVersion</td><td>String</td><td>True</td><td>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.</td></tr>
<tr><td>FunctionClasses</td><td>Array of Items of type String</td><td>True</td><td>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.</td></tr>
<tr><td>MaxTDPMilliWatts</td><td>Array of type number</td><td>True</td><td>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.</td></tr>
<tr><td>SecurityCapabilities</td><td>Object</td><td>True</td><td>This object shall contain properties which describe the security capabilities of the Memory.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>PassphraseCapable</td><td>Boolean</td><td>True</td><td>Memory passphrase set capability</td></tr>
<tr><td>MaxPassphraseCount</td><td>Number</td><td>True</td><td>Maximum number of passphrases supported for this Memory.</td></tr>
<tr><td>PassphraseLockLimit</td><td>Number</td><td>True</td><td>Maximum number of incorrect passphrase attempts allowed before memory is locked.</td></tr>
<tr><td>ConfigurationLockCapable</td><td>Boolean</td><td>True</td><td>Support for locking the configuration.</td></tr>
<tr><td>DataLockCapable</td><td>Boolean</td><td>True</td><td>Support for data locking.</td></tr>
</table></td></tr>
<tr><td>SpareDeviceCount</td><td>Number</td><td>True</td><td>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.</td></tr>
<tr><td>ConfigurationLocked</td><td>Boolean</td><td>True</td><td>Indicates that the configuration of this memory has been locked.</td></tr>
</table>

<table>
<tr><td>RankCount</td><td>Number</td><td>True</td><td>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.</td></tr>
<tr><td>MemoryLocation</td><td></td><td></td><td>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.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Socket</td><td>Number</td><td>True</td><td>Socket number in which Memory is connected.</td></tr>
<tr><td>MemoryController</td><td>Number</td><td>True</td><td>Memory controller number in which Memory is connected.</td></tr>
<tr><td>Channel</td><td>Number</td><td>True</td><td>Channel number in which Memory is connected.</td></tr>
<tr><td>Slot</td><td>Number</td><td>True</td><td>Slot number in which Memory is connected.</td></tr>
</table></td></tr>
<tr><td>ErrorCorrection</td><td>String</td><td>True</td><td>The value of this property shall be the error correction scheme supported for this memory.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>NoECC</td><td>No ECC available.</td></tr>
<tr><td>SingleBitECC</td><td>Single bit Data error can be corrected by ECC</td></tr>
<tr><td>MultiBitECC</td><td>Multi-bit Data errors can be corrected by ECC.</td></tr>
<tr><td>AddressParity</td><td>Address Parity errors can be corrected.</td></tr>
</table></td></tr>
<tr><td>OperatingSpeedMhz</td><td>Number</td><td>True</td><td>Operating speed of Memory in MHz</td></tr>
<tr><td>VolatileRegionSizeLimitMiB</td><td>Number</td><td>True</td><td>The value of this property shall be the total size of volatile regions in MiB.
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.</td></tr>
<tr><td>PersistentRegionSizeLimitMiB</td><td>Number</td><td>True</td><td>The value of this property shall be the total size of persistent regions in MiB.
NOTE</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</td></tr>
<tr><td>Regions</td><td>Array</td><td></td><td>The value of this property shall be the memory region information within the Memory.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<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>PassphraseEnabled</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>
<tr><td>SizeMiB</td><td>Number</td><td>True</td><td>Size of this memory region in MiB.</td></tr>
<tr><td>MemoryClassification</td><td>String</td><td>True</td><td>
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Volatile</td><td>Volatile memory</td></tr>
<tr><td>ByteAccessiblePersistent</td><td>Byte accessible Persistent memory</td></tr>
<tr><td>Block</td><td>Block accesible memory</td></tr>
</table>
</td></tr>
</table>
</td></tr>
<tr><td>OperatingMemoryModes</td><td>Array</td><td>True</td><td>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.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Volatile</td><td>Volatile memory.</td></tr>
<tr><td>PMEM</td><td>Persistent memory, byte accesible through system address space.</td></tr>
<tr><td>Block</td><td>Block accessible system memory.</td></tr>
</table>
</td></tr>
<tr><td>PowerManagementPolicy</td><td>Object</td><td>True</td><td>This object shall contain properties which describe the power management policy for the current</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>resource.<table><tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr><tr><td>PolicyEnabled</td><td>Boolean</td><td>True</td><td>Power management policy enabled status.</td></tr><tr><td>MaxTDPMilliWatts</td><td>Number</td><td>True</td><td>Maximum TDP in milliwatts.</td></tr><tr><td>PeakPowerBudgetMilliWatts</td><td>Number</td><td>True</td><td>Peak power budget in milli watts.Unit is mW.</td></tr><tr><td>AveragePowerBudgetMilliWatts</td><td>Number</td><td>True</td><td>Average power budget in milli watts.
Unit is mW.</td></tr></table></td></tr>
<tr><td>IsSpareDeviceEnabled</td><td>Boolean</td><td>True</td><td>Spare device enabled status.</td></tr>
<tr><td>IsRankSpareEnabled</td><td>Boolean</td><td>True</td><td>Rank spare enabled status.</td></tr>
<tr><td>VolatileRegionNumberLimit</td><td>Number</td><td>True</td><td>Total number of volatile regions this Memory can support.</td></tr>
<tr><td>PersistentRegionNumberLimit</td><td>Number</td><td>True</td><td>Total number of persistent regions this Memory can support.</td></tr>
<tr><td>VolatileRegionSizeMaxMiB</td><td>Number</td><td>True</td><td>Maximum size of a single volatile region in MiB</td></tr>
<tr><td>PersistentRegionSizeMaxMiB</td><td>Number</td><td>True</td><td>Maximum size of a single persistent region in MiB</td></tr>
<tr><td>AllocationIncrementMiB</td><td>Number</td><td>True</td><td>The boundary which memory regions are allocated on, measured in MiB</td></tr>
<tr><td>Links</td><td>Object</td><td></td><td>Contains references to other resources that are related to this resource.<table><tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr><tr><td>Oem</td><td>Object</td><td></td><td>Refer Table Resource Complex Types under Section Resource.
NOTE
It will be present in response if there is an oem property implemented according to "How to Add OEM extensions" document.</td></tr><tr><td>Chassis(N)</td><td>Array</td><td>True</td><td>A reference to the Chassis which contains this Memory.</td></tr></table></td></tr>
</table>

<table>
<tr><td rowspan="3">Status</td><td rowspan="3">Object</td><td rowspan="3"></td><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>State</td><td>String</td><td>True</td><td>Refer Section Resource Table Resource – Enum Types</td></tr>
<tr><td>Health</td><td>String</td><td>True</td><td>Refer Section Resource Table Resource – Enum Types</td></tr>
<tr><td>ModuleManufacturerID</td><td>String</td><td>True</td><td colspan="4">The value of this property shall be the two byte manufacturer ID of this memory module as defined by JEDEC in JEP-106.</td></tr>
<tr><td>ModuleProductID</td><td>String</td><td>True</td><td colspan="4">The value of this property shall be the two byte product ID of this memory module as defined by the manufacturer.</td></tr>
<tr><td>MemorySubsystemControllerManufacturerID</td><td>String</td><td>True</td><td colspan="4">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.</td></tr>
<tr><td>MemorySubsystemControllerProductID</td><td>String</td><td>True</td><td colspan="4">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.</td></tr>
<tr><td>VolatileSizeMiB</td><td>Number</td><td>True</td><td colspan="4">The value of this property shall be the total size of the volatile portion memory in MiB.</td></tr>
<tr><td>NonVolatileSizeMiB</td><td>Number</td><td>True</td><td colspan="4">The value of this property shall be the maximum size of a single volatile regions in MiB.</td></tr>
<tr><td>CacheSizeMiB</td><td>Number</td><td>True</td><td colspan="4">The value of this property shall be the total size of the cache portion memory in MiB.</td></tr>
<tr><td>LogicalSizeMiB</td><td>Number</td><td>True</td><td colspan="4">The value of this property shall be the total size of the logical memory in MiB.</td></tr>
<tr><td>Location (M)</td><td>Array</td><td>True</td><td colspan="4">Refer for Table Resource schema properties Resource.Location.</td></tr>
<tr><td>Metrics(N)</td><td>Object</td><td>True</td><td colspan="4">This property will have reference to the MemoryMetrics Resource which is populated under this MemoryInstance.
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.</td></tr>
</table>

Table 24 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 accesible memory.

POST

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

Request

POSThttps://{{ip}}/redfish/v1/Systems/{{Systems_instance}}/Memory/{{memory_instance}}/Actions/AmiBios.ChangeState

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"
}
```

Request

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response and "Status Codes".

3.6.9 Processor Collection

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

GET

Request

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

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

or
https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}/Processors

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.6.10 Processor

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

GET

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}}
or
https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}/Processors/{{NetworkAdapter_processor_instance}}
Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 25 Processor Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer ODATA Properties
@odata.id	String	True	Refer ODATA Properties
@odata.type	String	True	Refer ODATA Properties
@odata.etag	String	True	Refer ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Secction Resource. **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 Secction Resource
Socket	String	True	Identifies the physical location or socket of the processor.
Status	Object	True	Name / Type / Read Only / Description State / String / True / Refer Secction Resource, Table Resource - Enum Types Health / String / True / Refer Secction Resource, Table Resource - Enum Types. **NOTE** *Health Status is initially "OK" if processor is populated.*

<table>
<tr><td></td><td></td><td></td><td colspan="3"></td><td>Health value will be affected/changed through Sensor related logs as explained in detail in "How to Add OEM extensions" document.</td></tr>
<tr><td>ProcessorType</td><td>String</td><td>True</td><td colspan="6">Identifies the type of processor contained in this Socket.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>CPU</td><td>A Central Processing Unit.</td></tr><tr><td>GPU</td><td>A Graphics Processing Unit.</td></tr><tr><td>FPGA</td><td>A Field Programmable Gate Array.</td></tr><tr><td>DSP</td><td>A Digital Signal Processor.</td></tr><tr><td>Accelerator</td><td>An Accelerator</td></tr><tr><td>OEM</td><td>An OEM-defined Processing Unit.</td></tr><tr><td>Core</td><td>A Core in a Processor.</td></tr><tr><td>Thread</td><td>A Thread in a Processor.</td></tr></table></td></tr>
<tr><td>ProcessorArchitecture</td><td>String</td><td>True</td><td colspan="6">Identifies the architecture of the processor contained in this Socket<table><tr><th>Enum</th><th>Description</th></tr><tr><td>x86</td><td>x86 or x86-64</td></tr><tr><td>IA-64</td><td>Intel Itanium.</td></tr><tr><td>ARM</td><td>ARM</td></tr><tr><td>MIPS</td><td>MIPS</td></tr><tr><td>OEM</td><td>OEM-defined</td></tr></table></td></tr>
<tr><td>InstructionSet</td><td>String</td><td>True</td><td colspan="6">This property shall contain the string which identifies the instruction set of the processor contained in this socket.
NOTE
Northbound only supported.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>x86</td><td>x86 32-bit</td></tr><tr><td>x86-64</td><td>x86 64-bit</td></tr><tr><td>IA-64</td><td>Intel IA-64</td></tr><tr><td>ARM-A32</td><td>ARM 32-bit</td></tr><tr><td>ARM-A64</td><td>ARM 64-bit</td></tr><tr><td>MIPS32</td><td>MIPS 32-bit</td></tr><tr><td>MIPS64</td><td>MIPS 64-bit</td></tr><tr><td>OEM</td><td>OEM-defined</td></tr></table></td></tr>
<tr><td>ProcessorId</td><td>Object</td><td></td><td colspan="6">This object shall contain identification information for this processor.<table><tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr><tr><td>VendorId</td><td>String</td><td>True</td><td>This property shall indicate the Vendor Identification string information as provided by the manufacturer of this processor.</td></tr><tr><td>IdentificationRegisters</td><td>String</td><td>True</td><td>The contents of the Identification Registers (CPUID) for this</td></tr></table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>processor.</td></tr>
<tr><td></td><td></td><td></td><td>EffectiveFamily</td><td>String</td><td>True</td><td>The effective Family for this processor</td></tr>
<tr><td></td><td></td><td></td><td>EffectiveModel</td><td>String</td><td>True</td><td>This property shall indicate the effective Model information as provided by the manufacturer of this processor.</td></tr>
<tr><td></td><td></td><td></td><td>ProtectedIdentificationNumber</td><td>String</td><td>True</td><td>The Protected Processor Identification Number (PPIN) for this processor.</td></tr>
<tr><td></td><td></td><td></td><td>Step</td><td>String</td><td>True</td><td>This property shall indicate the Step or revision string information as provided by the manufacturer of this processor.</td></tr>
<tr><td></td><td></td><td></td><td>MicrocodeInfo</td><td>String</td><td>True</td><td>This property shall indicate the Microcode Information as provided by the manufacturer of this processor.</td></tr>
<tr><td>Manufacturer</td><td>String</td><td>True</td><td colspan="4">The manufacturer of the processor</td></tr>
<tr><td>OperatorConfigs</td><td>Object</td><td>True</td><td colspan="4">The link to collection of OperatingConfigs under this porcessors</td></tr>
<tr><td>AppliedOperatorConfig</td><td>Object</td><td>True</td><td colspan="4">The link to currently applied OperatingConfig</td></tr>
<tr><td>MaxSpeedMHz</td><td>Number</td><td>True</td><td colspan="4">The maximum clock speed of the processor.</td></tr>
<tr><td>Model</td><td>String</td><td>True</td><td colspan="4">This property shall indicate the model information as provided by the manufacturer of this processor.</td></tr>
<tr><td>PartNumber</td><td>String</td><td>True</td><td colspan="4">This property indicates a part numbe</td></tr>
<tr><td>SerialNumber</td><td>String</td><td>True</td><td colspan="4">The serial number of the processor</td></tr>
<tr><td>Version</td><td>String</td><td>True</td><td colspan="4">The hardware version of the processor</td></tr>
<tr><td>TotalCores</td><td>Number</td><td>True</td><td colspan="4">The total count of independent processor cores contained within this processor.</td></tr>
<tr><td>TotalThreads</td><td>Number</td><td>True</td><td colspan="4">The total count of independent execution threads supported by this processor.</td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td colspan="4">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><tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr><tr><td>Oem</td><td>Object</td><td>False</td><td>Refer Resource Complex Types under Section Resource.
NOTE
It will be present in response if there is an oem property</td></tr></table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>implemented according to "How to Add OEM extensions" document.</td></tr>
<tr><td></td><td></td><td></td><td>ConnectedProcessors</td><td>Array</td><td>True</td><td>An array of links to the processors directly connected to this processor.</td></tr>
<tr><td></td><td></td><td></td><td>ConnectedProcessors@odata.count</td><td>Number</td><td>True</td><td>The count of Processors directly connected to this processor.</td></tr>
<tr><td></td><td></td><td></td><td>Chassis(N)</td><td>Object</td><td>True</td><td>The value of this property shall be a reference to a resource of type Chassis that represent the physical container associated with this Processor.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td colspan="4">This object will contain the actions for this resource under Oem property if any.</td></tr>
<tr><td>SubProcessors</td><td>Object</td><td>True</td><td colspan="4">The value of this property shall be a link to a collection of type ProcessorCollection. Refer section ProcessorCollection.</td></tr>
<tr><td>Location</td><td>Object</td><td>True</td><td colspan="4">Refer for Table Resource 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.</td></tr>
<tr><td>AccelerationFunctions(N)</td><td>Object</td><td>True</td><td colspan="4">A reference to the collection of Acceleration Functions associated with this Processor.</td></tr>
<tr><td>Assembly</td><td>Object</td><td>True</td><td colspan="4">A reference to the Assembly resource associated with this 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.</td></tr>
<tr><td>MaxTDPWatts</td><td>Number</td><td>True</td><td colspan="4">The maximum Thermal Design Power (TDP) in watts.</td></tr>
<tr><td>Metrics(N)</td><td>Object</td><td>True</td><td colspan="4">A reference to the Metrics associated with this Processor.</td></tr>
<tr><td>TDPWatts</td><td>Number</td><td>True</td><td colspan="4">The nominal Thermal Design Power (TDP) in watts.</td></tr>
<tr><td>TotalEnabledCores</td><td>Number</td><td>True</td><td colspan="4">The total number of enabled cores contained in this processor.</td></tr>
<tr><td>UUID</td><td>String</td><td>True</td><td colspan="4">The universal unique identifier (UUID) for this processor.</td></tr>
<tr><td>FPGA</td><td>Object</td><td>True</td><td colspan="4">The properties specific for Processors of type FPGA. Refer Table Processor Properties</td></tr>
<tr><td>ProcessorMemory</td><td>Array</td><td>True</td><td colspan="4">The memory directly attached or integrated within this Processor.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>CapacityMiB</td><td>Numbe</td><td>True</td><td>The memory</td></tr>
</table>
</td></tr>
</table>

				r		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 Enum values of Memory Type
			SpeedMHz	Number	True	The operating speed of the memory in MHz.

Table 26 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
GDDRR6	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 27 Property table of FPGA

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>FirmwareId</td><td>String</td><td>True</td><td>The value of this property shall contain a string describing the FPGA firmware identifier.</td></tr>
<tr><td>FirmwareManufacturer</td><td>String</td><td>True</td><td>The FPGA firmware manufacturer.</td></tr>
<tr><td>FirmwareVersion</td><td>String</td><td>True</td><td>The FPGA firmware version.</td></tr>
<tr><td>FpgaType</td><td>String</td><td>True</td><td>The value of this property shall be a type of the FPGA device.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>Discrete</td><td>The discrete FPGA device.</td></tr><tr><td>Integrated</td><td>The FPGA device integrated with other processor in the single chip.</td></tr></table></td></tr>
<tr><td>Model</td><td>String</td><td>True</td><td>The value of this property shall be a model of the FPGA device.</td></tr>
<tr><td>PCIeVirtualFunctions</td><td>Number</td><td>True</td><td>The number of the PCIe Virtual Functions.</td></tr>
<tr><td>ProgrammableFromHost</td><td>Boolean</td><td>True</td><td>This flag indicates if the FPGA firmware can be reprogrammed from the host using system software.</td></tr>
<tr><td>ReconfigurationSlots</td><td>Array</td><td>True</td><td>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.<table><tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr><tr><td>AccelerationFunction</td><td>Object</td><td>True</td><td>A link to the Acceleration Function provided by the code programmed into a reconfiguration slot.</td></tr><tr><td>ProgrammableFromHost</td><td>Boolean</td><td>True</td><td>This flag indicates if the reconfiguration slot can be reprogrammed from the host using system software.</td></tr><tr><td>SlotId</td><td>String</td><td>True</td><td>The FPGA reconfiguration slot identifier.</td></tr><tr><td>UUID</td><td>String</td><td>True</td><td>The universal unique identifier (UUID) for this reconfiguration slot.</td></tr></table></td></tr>
<tr><td>HostInterface</td><td>Object</td><td>True</td><td>The FPGA interface to the host.
Refer Table 28 Property table of FPGA interface</td></tr>
<tr><td>ExternalInterfaces</td><td>Array</td><td>True</td><td>An array of the FPGA external interfaces.
Refer Table Property table of FPGA interface</td></tr>
</table>

Table 28 Property table of FPGA interface

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Ethernet</td><td>Object</td><td>True</td><td>Describes the Ethernet related information about this FPGA interface.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>MaxLanes</td><td>Number</td><td>True</td><td>This is the number of lanes supported by this interface.</td></tr>
<tr><td>MaxSpeed Mbps</td><td>Number</td><td>True</td><td>The maximum speed supported by this interface.</td></tr>
</table></td></tr>
<tr><td>InterfaceType</td><td>String</td><td>True</td><td>The FPGA interface type.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Ethernet</td><td>An Ethernet interface.</td></tr>
<tr><td>OEM</td><td>An OEM defined interface.</td></tr>
<tr><td>PCIe</td><td>A PCI Express interface.</td></tr>
<tr><td>QPI</td><td>The Intel QuickPath Interconnect.</td></tr>
<tr><td>UPI</td><td>The Intel UltraPath Interconnect.</td></tr>
</table></td></tr>
<tr><td>PCIe</td><td>Object</td><td>True</td><td>Describes the PCI-e related information about this FPGA interface.
Refer Table PCIeInterface Properties</td></tr>
</table>

3.6.11 Ethernet Interface Collection

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.

GET

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/EthernetInterfaces
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

Managers

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

GET

Request

```
https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.6.12 Ethernet Interface

Systems

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

GET – EthernetInterface Instance

Request for EthernetInterface Instance

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 29 Ethernet Interface Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Section Resource. **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 Resource for Status under Table Resource Complex Types.
InterfaceEnabled	Boolean	True	This indicates whether this interface is enabled.

<table>
<tr><td>PermanentMACAddress</td><td>String</td><td>True</td><td>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.</td></tr>
<tr><td>MTUSize</td><td>Number</td><td>True</td><td>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.
NOTE
Minimum size limit is 1280
Maximum size limit is 1500</td></tr>
<tr><td>MACAddress</td><td>String</td><td>True</td><td>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.</td></tr>
<tr><td>IPv4Addresses</td><td>Array of Objects</td><td>True</td><td>
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Address</td><td>String</td><td>True</td><td>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</td></tr>
<tr><td>SubnetMask</td><td>String</td><td>True</td><td>The value of this property shall be the IPv4 subnet mask for this address.
If DHCPv4 is enabled on the interface, this property becomes read-only.</td></tr>
<tr><td>Address Origin</td><td>String</td><td>True</td><td>The value of this property shall be the IP address origin for this network interface</td></tr>
<tr><td>Gateway</td><td>String</td><td>True</td><td>IPv4 default gateway address for this interface.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>If DHCPv4 is enabled on the interface and is configured to set the IPv4 default gateway address, this property becomes read-only.</td></tr>
<tr><td rowspan="5">IPv6Addresses</td><td rowspan="5">Array of Objects</td><td rowspan="5">True</td><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>Address</td><td>String</td><td>True</td><td>This property lists an IPv6 address that is currently assigned on this interface</td></tr>
<tr><td>PrefixLength</td><td>Number</td><td>True</td><td>The value of this property shall be the IPv6 address prefix length for this interface</td></tr>
<tr><td>Address Origin</td><td>String</td><td>True</td><td>The value of this property shall be the IPv6 address origin for this interface</td></tr>
<tr><td>Address State</td><td>String</td><td>True</td><td>The current state of this address as defined in RFC 4862.</td></tr>
<tr><td>IPv6DefaultGateway</td><td>String</td><td>True</td><td colspan="4">This is the Ipv6 default gateway address that is currently in use on this interface.</td></tr>
<tr><td>VLANs(N)</td><td>Object</td><td>True</td><td colspan="4">This is a reference to a collection of VLANs and is only used if the interface supports more than one VLANs.
Please refer VLAN Network Interface Collection
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.</td></tr>
<tr><td rowspan="4">LinkStatus</td><td rowspan="4">String</td><td rowspan="4">True</td><td colspan="4">The value of this property shall be the link status of this interface (port).</td></tr>
<tr><td>Enum</td><td colspan="3">Description</td></tr>
<tr><td>LinkUp</td><td colspan="3">The link is available for communication on this interface.</td></tr>
<tr><td>NoLink</td><td colspan="3">There is no link or connection detected on this interface.</td></tr>
<tr><td>LinkDown</td><td colspan="3">There is no link on this interface, but the interface is connected.</td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td colspan="4">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</td></tr>
</table>

			Name	Type	Read Only	Description
			Oem	Object	True	Refer Table Resource Complex Types under Section Resource. **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.
			NetworkDeviceFunction	Object	True	Link to NetworkDeviceFunction associated with this EthernetInterface
			Endpoints@odata.count	Number	True	An integer representing the number of items in a collection. **NOTE** *These will be available only as a part of FPX Product*
			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

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>reference a resource of type Endpoint.
NOTE
These will be available only as a part of FPX Product.</td></tr>
<tr><td>EthernetInterfaceType</td><td>String</td><td>True</td><td colspan="6">The type of interface.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>Physical</td><td>A physical Ethernet interface.</td></tr><tr><td>Virtual</td><td>A virtual Ethernet interface.</td></tr></table></td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td colspan="6">This object will contain the actions for this resource under Oem property if any.</td></tr>
<tr><td>IPv6AddressPolicyTable</td><td>array</td><td>True</td><td colspan="6">The value of this property represents the RFC6724-defined address selection policy table.
Refer Table IPv6AddressPolicyTable Properties
NOTE
The values of IPv6AddressPolicyTable property which are under Systems EthernetInterfaces are readonly properties</td></tr>
<tr><td>FQDN</td><td>String</td><td>True</td><td colspan="6">This is the complete, fully qualified domain name obtained by DNS for this interface.</td></tr>
<tr><td>FullDuplex</td><td>Boolean</td><td>True</td><td colspan="6">The value of this property indicates whether full-duplex mode is enabled on the Ethernet connection for the interface.</td></tr>
<tr><td>IPv6StaticAddresses</td><td>Array of Objects</td><td>True</td><td colspan="6">The value of this property shall be an array of objects used to represent the IPv6 static connection characteristics for this interface.
Refer Table IPv6StaticAddresses Properties.
NOTE
The values of IPv6StaticAddresses property which are under Systems EthernetInterfaces are readonly properties</td></tr>
<tr><td>MaxIPv6StaticAddresses</td><td>Number</td><td>True</td><td colspan="6">This indicates the number of array items supported by Ipv6StaticAddresses.</td></tr>
<tr><td>NameServers</td><td>Array [Items of type String]</td><td>True</td><td colspan="6">This represents DNS name servers that are currently in use on this interface.</td></tr>
<tr><td>DHCPv4</td><td>Object</td><td></td><td colspan="6">DHCPv4 Configuration Properties.<table><tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr><tr><td>DHCPEnabled</td><td>Boolean</td><td>True</td><td>Determines whether DHCPv4 is enabled on this interface.</td></tr><tr><td>UseDNSServers</td><td>Boolean</td><td>True</td><td>Determines whether to use DHCPv4 supplied DNS servers.
NOTE
Northbound only</td></tr></table></td></tr>
</table>

						support.
			Fallback Address	String	True	This property shall contain the fallback address method of DHCPv4. Enum: Static — Fall back to a static address specified by IPv4StaticAddresses. Enum: AutoConfig — Fall back to an autoconfiguredaddress. Enum: None — Continue attempting DHCP without a fallback address.
			UseGateway	Boolean	True	Determines whether to use a DHCPv4-supplied gateway. **NOTE** *Northbound only support.*
			UseDomainName	boolean	True	Determines whether to use a DHCPv4-supplied domain name. **NOTE** *Northbound only support.*
			UseNTPServers	boolean	True	Determines whether to use DHCPv4-supplied NTP servers. **NOTE** *Northbound only support.*
			UseStaticRoutes	boolean	True	Determines whether to use DHCPv4-supplied static routes. **NOTE** *Northbound only support.*

<table>
<tr><td rowspan="6">DHCPv6</td><td rowspan="6">Object</td><td rowspan="6"></td><td colspan="4">DHCPv6Configuration Configuration Properties</td></tr>
<tr><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>UseDNS Server</td><td>Boolean</td><td>True</td><td>When enabled, DNS server addresses supplied through DHCPv6 stateless mode will be used.
NOTE
Northbound only support.</td></tr>
<tr><td>OperatingMode</td><td>String</td><td>True</td><td>Determines the DHCPv6 operating mode for this interface</td></tr>
<tr><td>UseDomainName</td><td>Boolean</td><td>True</td><td>When enabled, the domain name supplied through DHCPv6 stateless mode will be used.
NOTE
Northbound only support.</td></tr>
<tr><td>UseNTP Servers</td><td>Boolean</td><td>True</td><td>When enabled, NTP server addresses supplied through DHCPv6 stateless mode will be used.
NOTE
Northbound only support.</td></tr>
<tr><td>UseRapidCommit</td><td>Boolean</td><td>True</td><td>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.</td></tr>
</table>

3.6.13 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".

Notes 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 Redfish.Settings.

GET –BIOS & BIOS/SD

Request for BIOS

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Bios
Content-Type: application/json
```

Request for BIOS/SD

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Bios/SD
Content-Type: application/json
```

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 30 Bios Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATAProperties
@odata.id	String	True	Refer Section ODATAProperties
@odata.type	String	True	Refer Section ODATAProperties
@odata.etag	String	True	Refer Section ODATAProperties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource.
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 Change Password or Reset Bios. 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.
ResetBiosToDefaultsPending(N)	Boolean	True	This property shall indicate whether there is a pending request to reset the BIOS attributes to default values. A successful completion of the ResetBios action shall set this property to 'true'. Applyingn the default attribute values to this resource shall set this property to 'false'. Services may reject modification requests to the settings resource if this property contains 'true'.

POST

BIOS RESET ACTION

Request

```
POST https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Bios/Actions/Bios.ResetBios
Content-Type: application/json
```

Example POST Request Body:

```
{
}
```

Response

The response status is 204 with no body. For Error Responses refer "Redfish Error Response" and "Status Codes".

BIOS CHANGE PASSWORD ACTION

Request

```
POST https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Bios/Actions/Bios.ChangePassword
Content-Type: application/json
```

Example POST Request Body:

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

Response

The response status is 204 with no body. For Error Responses refer "Redfish Error Response" and "Status Codes".

PATCH - BIOS SD

Request - PATCH

```
PATCH https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Bios/SD
Content-Type: application/json
```

Example PATCH Request Body:

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

Response

The response status is 204 with no body. For Error Responses refer "Redfish Error Response" and "Status Codes".

3.6.14 SimpleStorageCollection

This represents the collection of Simple Storage resources.

GET

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/SimpleStorage
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.6.15 SimpleStorage

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

GET

Request

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 31 Simple Storage Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource.
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 Resource 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 Table Resource Complex Types under Resource. **NOTE** *It will be present*

<table>
<tr><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td></td><td></td><td></td><td>in response if there is an oem property implemented according to "How to Add OEM extensions" document.</td></tr>
<tr><td>Chassis(N)</td><td>Object</td><td>True</td><td>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.</td></tr>
<tr><td>Storage</td><td>Object</td><td>True</td><td>Link to the Storage instance associated with this SimpleStorage instance</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td colspan="4">This object will contain the actions for this resource under Oem property if any.</td></tr>
<tr><td rowspan="7">Devices</td><td rowspan="7">Array Of Objects</td><td rowspan="7">True</td><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>Oem</td><td>Object</td><td>False</td><td>Refer Resource for Resource.Oem.</td></tr>
<tr><td>Name (M)</td><td>String</td><td>True</td><td>Name of the resource or array element</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Resource for Resource.Status.</td></tr>
<tr><td>Manufacturer</td><td>String</td><td>True</td><td>Name of the manufacturer of this storage device.</td></tr>
<tr><td>CapacityBytes</td><td>Number</td><td>True</td><td>The value of this property shall represent the size (in bytes) of the Storage Device.</td></tr>
<tr><td>Model</td><td>String</td><td>True</td><td>Model number of this device.</td></tr>
</table>

3.6.16 VLAN Network Interface Collection

This represents the collection of VLAN Interface Collection resources.

GET

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}}/NetworkDeviceFunctions/{{network_device-function_instance}}/Ethernet/VLANs

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

POST

Request

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

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

Content-Type: application/json

Example POST Request Body:

```
{
   "VLANId" : 100,
   "VLANEnable" :true,
   "VLANPriority" :2
}
```

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.6.17 VLAN Network Interface

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.

GET

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}}/NetworkDeviceFunctions/{{network_device-function_instance}}/Ethernet/VLANs/{{Vlan_instance}}

Content-Type: application/json

Eg:

https://{{ip}}/redfish/v1/Systems/Self/EthernetInterfaces/EthernetInterface0/VLANs/{{system_vlan_instance}}

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 32 VLAN Network Interface

Name	Type	Read Only	Description
@Redfish.Settings	Object	True	A Reference to the FutureState URI for this resource. Name: @odata.type — Type: String — Read Only: True — Description: Refer Section ODATA Properties Name: SettingsObject — Type: Object — Read Only: True — Description: A Reference to the FutureState URI for this resource. **NOTE** *This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed*

						information).
@odata.context	String	True	Refer Section ODATA Properties			
@odata.id	String	True	Refer Section ODATA Properties			
@odata.type	String	True	Refer Section ODATA Properties			
@odata.etag	String	True	Refer Section ODATA Properties			
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource.			
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:0 & Maximum:4094.			
VLANPriority	Number	True	This property shall contain the priority for this VLAN. Minimum:0 & Maximum: 7			
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			

DELETE

Request

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

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

Content-Type: application/json

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.6.18 VLANNetworkInterface Future State (SD)

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.

GET

Request

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

Content-Type: application/json

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{network_apadter_instance}}/NetworkDeviceFunctions/{{network_devicefunction_instance}}/Ethernet/VLANs/{{Vlan_instance}}/SD

Content-Type: application/json

Eg:

https://{{ip}}/redfish/v1/Systems/Self/EthernetInterfaces/EthernetInterface0/VLANs/{{system_vlan_instance}}/SD

Response

The response of the request will be in JSON format. The properties are mentioned in Table VLAN Network Interface.

PATCH

Request

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

Content-Type: application/json

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{network_apadter_instance}}/NetworkDeviceFunctions/{{network_devicefunction_instance}}/Ethernet/VLANs/{{Vlan_instance}}/SD

Content-Type: application/json

Example PATCH Request Body:

```
{
   "VLANId" : 100,
   "VLANEnable" :true,
   "VLANPriority" :2
}
```

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.6.19 NetworkInterfaceCollection

It displays the collection of network interface resource instances available in the system.

GET

Request

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

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.6.20 NetworkInterface

A NetworkInterface contains references linking NetworkAdapter, and NetworkDeviceFunction resources and represents the functionality available to the containing system.

GET

Request

https://{{ip}}/redfish/v1/Systems/Self/NetworkInterfaces/{{NetworkInterface_instance}}

Content-Type: application/json

Response

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

Table 33 NetworkInterface Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource
Status	Object	True	Refer Resource 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.			
Ports	Object	True	The link to the ports associated with this network interface.			
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			

3.6.21 Storage Collection

It displays the collection of storage resource instances available in the system.

GET

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.6.22 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.

GET

Request

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 34 Storage Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource
Status	Object	True	Refer Resource 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 Resource. **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 of Object	True	A collection that indicates all the storage controllers that this resource represents. **NOTE** *Refer Table Storage Controller Properties*			
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.			
Controllers	Object	True	A collection that indicates all the Controllers associated with this storage instance			
SimpleStorage	Object	True	The link to the simple storage instance			

Table 35 Storage Controller Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.id</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>MemberId</td><td>String</td><td>True</td><td>This is the identifier for the member within the collection.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Oem.</td></tr>
<tr><td>Assembly</td><td>Object</td><td>True</td><td>The link to the assembly associated with this storage 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.</td></tr>
<tr><td>ControllerRates</td><td>Object</td><td></td><td>This type describes the various controller rates used for processes such as Volume Rebuild or Consistency Checks.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>ConsistencyCheckRatePercent</td><td>Number</td><td>True</td><td>The percentage of controller Resources used for performing a data consistency check on volumes.</td></tr>
<tr><td>RebuildRatePercent</td><td>Number</td><td>True</td><td>The percentage of controller Resources used for rebuilding/repairing volumes.</td></tr>
<tr><td>TransformationRatePercent</td><td>Number</td><td>True</td><td>The percentage of controller Resources used for transforming volumes from one configuration to another.</td></tr>
</table></td></tr>
<tr><td>Name</td><td>String</td><td>True</td><td>The name of the Storage Controller.</td></tr>
<tr><td>SpeedGbps</td><td>Number</td><td>True</td><td>The value of this property shall represent the speed of the Storage bus interface (in Gigabits per second).</td></tr>
<tr><td>FirmwareVersion</td><td>String</td><td>True</td><td>The firmware version of this storage Controller.</td></tr>
<tr><td>Manufacturer</td><td>String</td><td>True</td><td>This is the manufacturer of this storage controller.</td></tr>
<tr><td>Model</td><td>String</td><td>True</td><td>This is the model number for the storage controller.</td></tr>
<tr><td>SKU</td><td>String</td><td>True</td><td>This is the SKU for this storage controller.</td></tr>
<tr><td>SerialNumber</td><td>String</td><td>True</td><td>The serial number for this storage controller.</td></tr>
<tr><td>PartNumber</td><td>String</td><td>True</td><td>The part number for this storage controller.</td></tr>
<tr><td>AssetTag</td><td>String</td><td>False</td><td>The user assigned asset tag for this storage controller. Default it will be null value</td></tr>
</table>

<table>
<tr><td>SupportedControllerProtocols</td><td>Array</td><td>True</td><td>ReferTable Storage Controller Properties Protocol Properties for allowed Enum in Array.</td></tr>
<tr><td>SupportedDeviceProtocols</td><td>Array</td><td>True</td><td>ReferTable Protocol Properties Protocol Properties for allowed Enum in Array.</td></tr>
<tr><td>Identifiers</td><td>Array</td><td>True</td><td>This property shall contain a list of all known durable names for the associated storage controller. Please refer Resource Section Resource.</td></tr>
<tr><td>Location</td><td>Object</td><td>True</td><td>Refer for Table Resource schema properties</td></tr>
<tr><td>CacheSummary</td><td>Object</td><td>True</td><td>This object describes the cache memory of the storage controller in general detail.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>PersistentCacheSizeMiB</td><td>Number</td><td>True</td><td>The portion of the cache memory that is persistent, measured in MiB.</td></tr>
<tr><td>TotalCacheSizeMiB</td><td>Number</td><td>True</td><td>The total configured cache memory, measured in MiB.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Oem</td></tr>
</table></td></tr>
<tr><td>PCIeInterface</td><td>Object</td><td></td><td>The PCIe interface details for this controller. Refer Table PCIeInterface Properties</td></tr>
<tr><td>SupportedRAIDTypes</td><td>Array</td><td>True</td><td>This object describes the RAID Types supported by the storage controller.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>RAID0</td><td>A placement policy that splits data evenly across two or more disks, without parity information, redundancy, or fault tolerance.</td></tr>
<tr><td>RAID1</td><td>A placement policy where each logical block of data is stored on more than one independent storage device</td></tr>
<tr><td>RAID5</td><td>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</td></tr>
<tr><td>RAID6</td><td>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</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td colspan="4">devices where the parity and data blocks are interleaved across the storage devices</td></tr>
<tr><td rowspan="4">Links</td><td rowspan="4">Object</td><td rowspan="4">True</td><td colspan="5">Contains references to other resources that are related to this resource.</td></tr>
<tr><td>Name</td><td colspan="2">Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>Endpoints @odata.count</td><td colspan="2">Number</td><td>True</td><td>An integer representing the number of items in a collection.</td></tr>
<tr><td>Endpoints (N)</td><td colspan="2">Array</td><td>True</td><td>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.</td></tr>
</table>

Table 36 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.
FCP	Fibre Channel Protocol for SCSI
FICON	FIbre CONnection
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
TFTP	Trivial File Transfer Protocol
GenZ	This value shall indicate conformance to the Gen-Z Core Specification
MultiProtocol	This value shall indicate conformance to multiple protocols
InfiniBand	This value shall indicate conformance to the InfiniBand Architecture Specification-defined InfiniBand protocol
Ethernet	This value shall indicate conformance to the IEEE 802.3 Ethernet specification
NVLink	This value shall indicate conformance to the NVIDIA NVLink protocol
OEM	OEM-specific.
DisplayPort	This value shall indicate conformance to the VESA DisplayPort Specification
HDMI	This value shall indicate conformance to the HDMI Forum HDMI Specification
VGA	This value shall indicate conformance to the VESA SVGA Specification
DVI	This value shall indicate conformance to the Digital Display Working Group DVI-A, DVI-D, or DVI-I Specification

3.6.23 Volume Collection

It displays the collection of volume resource instances available in the system.

GET

Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}/Volumes
Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

POST

Request

POSThttps://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}/Volumes
Content-Type: application/json

The following properties are mandatory to create a volume:

- Name
- RAIDType
- StripSizeBytes
- ReadCachePolicyType
- WriteCachePolicyType
- Oem/Ami/ControllerID
- Oem/Ami/Initialization
- Oem/Ami/DiskCachePolicy
- Oem/Ami/AccessPolicy
- Oem/Ami

Example POST Request Body:

- The RAIDType can be one of the following values: ‘’RAID0’’, ‘’RAID1’’, ‘’RAID5’’, ‘’RAID6’’.
- The StripSizeBytes can be one of the following values: ‘’64K’’ , ‘’128K’’, ‘’256K’’ , ‘’512K’’ , ‘’1MB’’
- The ReadCachePolicyType can be one of the following values: ‘’Off’’ , ‘’ReadAhead’’
- The WriteCachePolicyType can be one of the following values: ‘’WriteThrough’’, ‘’UnprotectedWriteBack’’
- The Oem/Ami/Initialization can be one of the following values: No_Initialization , Quick_Initialization , Full_Initialization
- The Oem/Ami/DiskCachePolicy can be one of the following values: Unchanged , Enabled , Disabled
- The Oem/Ami/AccessPolicy can be one of the following values: Read-Write , Read_Only , Blocked

```
POST https://{{ip}}/redfish/v1/Systems/Self/Storage/{{Storage_instance}}/Volumes
Content-Type: application/json

{
   "Name" : "Volume_Name",
   "RAIDType" : "RAID0",
   "StripSizeBytes" : "64K",
   "ReadCachePolicyType" : "ReadAhead",
   "WriteCachePolicyType" : "WriteThrough",
   "Oem" : {
            "Ami" : {
                     "ControllerID" : "/redfish/v1/Systems/Self/Storage/StorageController_0,"
                     "Initialization" : "No_Initialization",
                     "DiskCachePolicy" : "Unchanged',
                     "AccessPolicy" : "Read-Write',
                     "Device" : [
                              "/redfish/v1/Systems/Self/Storage/StorageController_0/Drives/5 ,"
                              "/redfish/v1/Systems/Self/Storage/StorageController_0/Drives/6"
                     ]
            }
     }
}
```

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and "Section Status Codes".

3.6.24 Volume

Volume contains properties used to describe a volume, virtual disk, LUN, or other logical storage entity for any system.

GET

Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}/Volumes/{{Volume_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 37 Volume Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource
Status	Object	True	Refer Resource 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

<table>
<tr><td></td><td></td><td></td><td></td><td>information.</td></tr>
<tr><td></td><td></td><td></td><td>SpannedMirrors</td><td>The volume is a spanned set of mirrored devices.</td></tr>
<tr><td></td><td></td><td></td><td>SpannedStripesWithParity</td><td>The volume is a spanned set of devices which uses parity to retain redundant information.</td></tr>
<tr><td>Encrypted</td><td>Boolean, False</td><td>True</td><td colspan="2">This property shall contain a boolean indicator if the Volume is currently utilizing encryption or not. Default it will be null value</td></tr>
<tr><td>EncryptionTypes</td><td>Array</td><td>True</td><td colspan="2">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.</td></tr>
<tr><td>Identifiers</td><td>Array</td><td>True</td><td colspan="2">This property shall contain a list of all known durable names for the associated volume.</td></tr>
<tr><td>BlockSizeBytes</td><td>Number</td><td>True</td><td colspan="2">The size of the smallest addressible unit (Block) of this volume in bytes.</td></tr>
<tr><td>Operations</td><td>Array</td><td></td><td colspan="2">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.</td></tr>
<tr><td>OptimumIOSizeBytes</td><td>Number</td><td>True</td><td colspan="2">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.</td></tr>
<tr><td>Links</td><td></td><td></td><td colspan="2">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 Table Resource Complex Types under Section Resource.</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>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.</td></tr>
<tr><td></td><td></td><td></td><td>Drives@odata.count</td><td>Number</td><td>True</td><td>An integer representing the number of items in a collection.</td></tr>
<tr><td></td><td></td><td></td><td>Drives(N)</td><td>Array</td><td>True</td><td>An array of references to the chassis to which this storage subsystem is attached</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td colspan="4">Volume.Initialize is the available actions for this resource</td></tr>
<tr><td>NVMeNamespace Properties</td><td>Object</td><td>True</td><td colspan="4">This property contains properties to use when Volume is used to describe an NVMe Namespace.
<table><tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr><tr><td>NamespaceID</td><td>String</td><td>True</td><td>The NVMe Namespace Identifier for this namespace.</td></tr><tr><td>FormattedLBASize</td><td>string</td><td>True</td><td>The LBA data size and metadata</td></tr><tr><td>MetadataTransferredAtEndOfDataLBA</td><td>boolean</td><td>True</td><td>This property indicates whether or</td></tr><tr><td>NumberLBAFormats</td><td>integer</td><td></td><td>NumberLBA Formats</td></tr><tr><td>NVMeVersion</td><td>string</td><td>True</td><td>The version of the NVMe Base</td></tr></table></td></tr>
<tr><td>VolumeUsage</td><td>String</td><td>True</td><td colspan="4">Indicates the Volume usage type setting for the Volume.</td></tr>
<tr><td>StripSizeBytes</td><td>number</td><td>True</td><td colspan="4">The number of blocks (bytes) in a strip in a disk array that uses striped data mapping.</td></tr>
<tr><td>Compressed</td><td>Boolean</td><td>True</td><td colspan="4">Indicator of whether or not the Volume has compression enabled.</td></tr>
<tr><td>Deduplicated</td><td>Boolean</td><td>True</td><td colspan="4">Indicator of whether or not the Volume has deduplication enabled.</td></tr>
<tr><td>DisplayName</td><td>String</td><td>True</td><td colspan="4">A user-configurable string to name the volume.</td></tr>
</table>

LogicalUnitNumber	number	True	Indicates the host-visible LogicalUnitNumber assigned to this Volume.
Manufacturer	String	True	The manufacturer or OEM of this storage volume.
Model	String	True	The model number for this storage volume.
MediaSpanCount	number	True	Indicates the number of media elements used per span in the secondary RAID for a hierarchical RAID type.
ProvisioningPolicy	String	True	This property specifies the volume's storage allocation, or provisioning policy.
RAIDType	String	True	The RAID type of this volume.
ReadCachePolicy	String	True	Indicates the read cache policy setting for the Volume.
RemainingCapacityPercent	number	True	The percentage of the capacity remaining in the Volume.
WriteHoleProtectionPolicy	String	True	The policy that the RAID volume is using to address the write hole issue.
WriteCacheState	String	True	Indicates the WriteCacheState policy setting for the Volume.
WriteCachePolicy	String	True	Indicates the write cache policy setting for the Volume.
MaxBlockSizeByte	number	True	Max Block size in bytes.
ReplicaInfo	Object	True	Describes this storage volume in its role as a target replica.
RecoverableCapacitySourceCount	Number	True	Current number of capacity source resources that are available as replacements.

Table 38 ReplicaInfo Properties table

Name	Type	Read Only	Description
ConsistencyEnabled	Boolean	True	True if consistency is enabled.
ConsistencyState	String	True	The current state of consistency.
ConsistencyStatus	String	True	The current status of consistency.
ConsistencyType	String	True	Indicates the consistency type used by the source and its associated target group.
FailedCopyStopsHostIO	Boolean	True	If true, the storage array tells host to stop sending data to source element if copying to a remote element fails.
PercentSynced	number	True	Specifies the percent of the work completed to reach synchronization.
ReplicaPriority	String	True	The priority of background copy engine I/O to be managed relative to host I/O operations during a sequential background copy operation.
ReplicaProgressStatus	String	True	The status of the session with respect to Replication activity.
ReplicaReadOnlyAccess	String	True	True This property specifies whether the source, the target, or both elements are read only to the host.
ReplicaRecoveryMode	String	True	Describes whether the copy operation continues after a broken link is restored.
ReplicaRole	String	True	The source or target role of this replica.
ReplicaSkewBytes	String	True	Applies to Adaptive mode and it describes maximum number of bytes the SyncedElement (target) can be out of sync.
ReplicaState	String	True	ReplicaState describes the state of the relationship with respect to Replication activity.
ReplicaType	String	True	ReplicaType describes the intended outcome of the replication.
ReplicaUpdateMode	String	True	Describes whether the target elements will be updated synchronously or asynchronously.
RequestedReplicaState	String	True	The last requested or desired state for the relationship.
SyncMaintained	String	True	Synchronization is maintained.
UndiscoveredElement	String	True	This property specifies whether the source, the target, or both elements involved in a copy operation are undiscovered
WhenActivated	String	True	Specifies when point-in-time copy was taken or when the replication relationship is activated, reactivated, resumed or re-established.
WhenDeactivated	String	True	Specifies when the replication relationship is deactivated.
WhenEstablished	String	True	Specifies when the replication relationship is established.
WhenSuspended	String	True	Specifies when the replication relationship is suspended.
WhenSynced	String	True	The point in time that the Elements were synchronized.
WhenSynchronized	String	True	Specifies when the replication relationship is synchronized.

3.6.25 Secure Boot

This resource contains UEFI Secure Boot information. It represents properties for managing the UEFI Secure Boot functionality of a system.

GET

Request

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 39 Secure Boot Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Resource. **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 Resource
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.
SecureBootDatabases	Object	True	The value of this property shall be a link to a resource collection of type SecureBootDatabaseCollection.

PATCH

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/SecureBoot
Content-Type: application/json
```

Example PATCH Request Body:

```
{ "SecureBootEnable" : true }
```

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and "Section Status Codes".

3.6.26 Secure Boot Databases Collection

This is the schema definition for SecureBootDatabases collection.

GET

Request

https://{{ip}}/redfish/v1/Systems/{ComputerSystem_Id}/SecureBoot/SecureBootDatabases

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.6.27 Secure Boot Databases

This is the schema definition that describes a UEFI Secure Boot database used to store certificates or hashes.

GET

Request

https://{{ip}}/redfish/v1/Systems/{ ComputerSystem_Id }/SecureBoot/SecureBootDatabases/{{SecureBootDatabses_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 40 Secure Boot Databases Instance Properties

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

<table>
<tr><td>Description</td><td>String</td><td>True</td><td>Provides description of the resource. Refer Resource</td></tr>
<tr><td>DatabaseId</td><td>String</td><td>True</td><td>This property shall contain the name of the UEFI Secure Boot database. This property shall contain the same value as the Id property. The value shall be one of the UEFI-defined Secure Boot databases: `PK`, `KEK` `db`, `dbx`, `dbr`, `dbt`, `PKdefault`, `KEKDefault`, `dbDefault`, `dbxDefault`, `dbrDefault`, or `dbtDefault`.</td></tr>
<tr><td>Certificates</td><td>Object</td><td>True</td><td>A link to the collection of certificates contained in this UEFI Secure Boot database.</td></tr>
<tr><td>Signatures</td><td>Object</td><td>True</td><td>The revision of this Drive. This is typically the firmware/hardware version of the drive.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>This action is used to reset the UEFI Secure Boot keys of this database. ResetKeys action and it’s allowable values are as given below.
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.
<table><tr><th>Enum</th><th>Description</th></tr><tr><td>ResetKeys</td><td>This action is used to reset the UEFI Secure Boot keys of this database.</td></tr></table></td></tr>
</table>

POST

ResetKeysType can be one among the following: **ResetAllKeysToDefault**, **DeleteAllKeys**

Request

https://{{ip}}/redfish/v1/Systems/{ComputerSystems_Id}/SecureBoot/SecureBootDatabases/{SecureBootDatabases_Instance}/Actions/SecureBootDatabase.ResetKeys

Content-Type: application/json

Example POST Request Body:

```
{ "ResetKeysType" : "ResetAllKeysToDefault" }
```

Response

The response status is 204 with no body.

3.6.28 Secure Boot Databases Signatures Collection

This is the schema definition for signature collection for a secureboot databases instance.

GET

Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/SecureBoot/SecureBootDatabases/{{secureboot_databases_instance}}/Signatures

Content-Type: application/json

Response

Please refer Section Colllection for the JSON response properties.

POST [Creating new Signatures]

Request

POST

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/SecureBoot/SecureBootDatabases/{{secureboot_databases_instance}}/Signatures

Content-Type: application/json

Example POST Request:

```
{
   "SignatureString" :"80B4D96931BF0D02FD91A61E19D14F1DA452E66DB2408CA8604D411F92659F0A"
   "SignatureType" : "EFI_CERT_SHA256_GUID" ,
   "SignatureTypeRegistry": "UEFI" ,
   "UEFISignatureOwner" : "77FA9ABD-0359-4D32-BD60-28F4E78F784B"
}
```

NOTE:

- *SignatureString, SignatureType and SignatureTypeRegistry are mandatory properties for creating (POST) signatures.*
- *Based on UEFI SPEC, PK/KEK should only include public key or Public key certificate(s).*
- *"Redfish API should not have an option to add Hash certificates (signatures) to PK/KEK. Creating (POST) Signatures are not allowed for **non-default** secureboot databases(`PK`, `KEK`).The response is 405 Method Not Allowed"*
- *Creating (POST) Signatures are allowed only for **non-default** secureboot databases(`db`, `dbx`, `dbr`,`dbt`). Default databases (`PKdefault`, `KEKDefault`, `dbDefault`, `dbxDefault`, `dbrDefault`, `dbtDefault`) doesn't support POST.*
- *Out Of Band POST request 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.*

Response

The response status is 201 and the response body is a GET Response with the properties of the newly created Signatures. For Error Responses refer ”Redfish Error Response” and “Status Codes”.

3.6.29 SecureBootDatabases Signatures Instance

This is the schema definition for a signature or a hash for a secureboot databases instance.

GET

Request

https://{{ip}}/redfish/v1/Systems/{ComputerSystems_Id}/SecureBoot/SecureBootDatabases/{{SecureBootDatabses_instance}}/Signatures/{{signature_instance}}

Content-Type: application/json

Response

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

Table 41 Secure Boot Databases Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object	False	Refer Resource Complex Types under Resource. **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 Resource
SignatureString	String	True	This property shall contain the string of the signature, and the format shall follow the requirements specified by the value of the SignatureType property.
SignatureType	String	True	This property shall contain the format type for the signature.
SignatureType Registry	String	True	This property shall contain the type for the signature.
UefiSignature Owner	String	True	The value of this property shall contain the GUID of the UEFI signature owner for this signature as defined by the UEFI Specification. This property shall only be present if the SignatureTypeRegistry property is `UEFI`.

DELETE

Request

https://{{ip}}/redfish/v1/Systems/{ComputerSystems_Id}/SecureBoot/SecureBootDatabases/{{SecureBootDatabses_instance}}/Signatures/{{signature_instance}}

Content-Type: application/json

Response

The response status is 204 and no response body. For Error Responses refer ”Redfish Error Response” and “Status Codes”.

NOTE

- *The DELETE method is allowed only for the **non-default** secureboot databases(`PK`, `KEK` `db`, `dbx`, `dbr`, `dbt`). Default databases (`PKdefault`, `KEKDefault`, `dbDefault`, `dbxDefault`, `dbrDefault`, `dbtDefault`) doesn't support DELETE method.*
- *Out Of Band DELETE 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.*

3.6.30 SecureBootDatabases Certificates API

This is the schema definition for Certificate Collection of secureboot databases instance. Refer section CertificateServiceAPI.

NOTE

- *New certificates can be created (POST) only for non-default database instances(`PK`, `KEK` `db`, `dbx`, `dbr`, `dbt`) .*
- *Actions GenerateCSR, Rekey/Reney and ReplaceCerticates are not supported for SecureBootdatabases certificates.*
- *Certificate Instance resource support DELETE for removing certificates only for non-default databases(`PK`, `KEK` `db`, `dbx`, `dbr`, `dbt`).*
- *Out Of Band request for creating and deleting certificates 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.*

3.6.31 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 AMI Bios Support is needed Refer Section Manager RedfishPowerSaveMode Action)

GET

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage/1/Drives/{{Drives_instance}}
Content-Type: application/json
```

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 42 Drives Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object	False	Refer Resource Complex Types under Resource. **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 Resource
Status	Object	True	Refer Resource 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
Assembly	Object	True	The link to the assembly associated with this Drive. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be*

<table>
<tr><td></td><td></td><td></td><td>added.</td></tr>
<tr><td>Revision</td><td>String</td><td>True</td><td>The revision of this Drive. This is typically the firmware/hardware version of the drive.</td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td>The links object contains the links to other resources that are related to this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Endpoints</td><td>Array</td><td>True</td><td>An array of references to the endpoints that connect to this drive.</td></tr>
<tr><td>Endpoints@odata.count</td><td>Number</td><td>True</td><td>An integer representing the number of items in a collection.</td></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>Refer Table Resource Complex Types under Section Resource.
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.</td></tr>
<tr><td>Chassis</td><td>Object</td><td>True</td><td>A reference to the Chassis which contains this Drive.</td></tr>
<tr><td>Storage</td><td>Object</td><td>True</td><td>This property shall contain a link to a resource of type Storage that represents the storage subsystem to which this drive belongs.</td></tr>
<tr><td>PCIeFunctions</td><td>Array</td><td>True</td><td>An array of references to the PCIe Functions which the drive produces.</td></tr>
<tr><td>PCIeFunctions@odata.count</td><td>Number</td><td>True</td><td>An integer representing the number of items in a collection.</td></tr>
<tr><td>Volumes</td><td>Array</td><td>True</td><td>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.</td></tr>
<tr><td>Volumes@odata.count</td><td>Number</td><td>True</td><td>An integer representing the number of items in a collection.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>Operations</td><td>Object</td><td>True</td><td>The operations currently running on the Drive.<table><tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr><tr><td>Operation Name</td><td>String</td><td>True</td><td>The name of the operation.</td></tr><tr><td>Percentage Complete</td><td>Number</td><td>True</td><td>The percentage of the operation that has been completed.</td></tr><tr><td>Associated Task</td><td>Object</td><td>True</td><td>A reference to the task associated with the operation if any.</td></tr></table></td></tr>
<tr><td>StatusIndicator</td><td>String</td><td>True</td><td>The state of the status indicator, used to communicate status information about this drive.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>OK</td><td>The drive is OK.</td></tr><tr><td>Fail</td><td>The drive has failed.</td></tr><tr><td>Rebuild</td><td>The drive is being rebuilt.</td></tr><tr><td>PredictiveFailureAnalysis</td><td>The drive is still working but predicted to fail soon.</td></tr><tr><td>Hotspare</td><td>The drive is marked to be automatically rebuilt and used as a replacement for a failed drive.</td></tr><tr><td>InACriticalArray</td><td>The array that this drive is a part of is degraded.</td></tr><tr><td>InAFailedArray</td><td>The array that this drive is a part of is failed.</td></tr></table></td></tr>
<tr><td>IndicatorLED</td><td>String</td><td>True</td><td>The state of the indicator LED, used to identify the drive. Default it will be null value<table><tr><th>Enum</th><th>Description</th></tr><tr><td>Lit</td><td>The Indicator LED is lit</td></tr><tr><td>Blinking</td><td>The Indicator LED is blinking.</td></tr><tr><td>Off</td><td>The Indicator LED is off.</td></tr></table></td></tr>
<tr><td>CapacityBytes</td><td>Number</td><td>True</td><td>The size in bytes of this Drive.</td></tr>
<tr><td>FailurePredicted</td><td>Boolean</td><td>True</td><td>Is this drive currently predicting a failure in the near future.</td></tr>
<tr><td>PhysicalLocation</td><td>Object</td><td>True</td><td>Refer for Table Resource schema properties.</td></tr>
<tr><td>Protocol</td><td>String</td><td>True</td><td>The protocol this drive is using to communicate to the storage controller.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>PCIe</td><td>PCI Express (Vendor Proprietary)</td></tr><tr><td>AHCI</td><td>Advanced Host Controller Interface</td></tr><tr><td>UHCI</td><td>Universal Host Controller Interface</td></tr><tr><td>SAS</td><td>Serial Attached SCSI</td></tr><tr><td>SATA</td><td>Serial AT Attachment</td></tr><tr><td>USB</td><td>Universal Serial Bus</td></tr><tr><td>NVMe</td><td>Non-Volatile Memory Express</td></tr><tr><td>FC</td><td>Fibre Channel</td></tr><tr><td>iSCSI</td><td>Internet SCSI</td></tr><tr><td>FCoE</td><td>Fibre Channel over Ethernet</td></tr><tr><td>NVMeOverFabrics</td><td>NVMe over Fabrics</td></tr><tr><td>SMB</td><td>Server Message Block (aka CIFS</td></tr></table></td></tr>
</table>

				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 Resource schema properties.	
EncryptionAbility	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

<table>
<tr><td></td><td></td><td></td><td></td><td>the system requires user intervention to expose the data.</td></tr>
<tr><td>RotationSpeedRPM</td><td>Number</td><td>True</td><td colspan="2">The rotation speed of this Drive in Revolutions per Minute (RPM).</td></tr>
<tr><td>BlockSizeBytes</td><td>Number</td><td>True</td><td colspan="2">The size of the smallest addressable unit (Block) of this drive in bytes.</td></tr>
<tr><td>CapableSpeedGbs</td><td>Number</td><td>True</td><td colspan="2">The speed which this drive can communicate to a storage controller in ideal conditions in Gigabits per second.</td></tr>
<tr><td>NegotiatedSpeedGbs</td><td>Number</td><td>True</td><td colspan="2">The speed which this drive is currently communicating to the storage controller in Gigabits per second.</td></tr>
<tr><td>PredictedMediaLifeLeftPercent</td><td>Number</td><td>True</td><td colspan="2">The percentage of reads and writes that are predicted to still be available for the media.</td></tr>
<tr><td>HotspareReplacementMode</td><td>String</td><td>True</td><td colspan="2">The replacement mode for the hotspare drive.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>NonRevertible</td><td>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.</td></tr><tr><td>Revertible</td><td>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.</td></tr></table></td></tr>
<tr><td>WriteCacheEnabled</td><td>Boolean</td><td>True</td><td colspan="2">This property shall indicate whether the drive write cache is enabled.</td></tr>
<tr><td>LocationIndicatorActive</td><td>Boolean</td><td>True</td><td colspan="2">An indicator allowing an operator to physically locate this resource</td></tr>
<tr><td>ReadyToRemove</td><td>Boolean</td><td>True</td><td colspan="2">An indication of whether the drive is prepared by the system for removal.</td></tr>
</table>

3.6.32 MemoryDomain Collection

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

GET

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/MemoryDomains
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.6.33 MemoryDomain

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

GET

Request

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 43 Memory Domain Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource
AllowsMemory ChunkCreation	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.

3.6.34 MemoryChunks Collection

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

GET

Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/MemoryDomains/{{MemoryDomain_instance}}/MemoryChunks

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.6.35 MemoryChunks

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

GET

Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/MemoryDomains/{{MemoryDomain_instance}}/MemoryChunks/{{MemoryChunks_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 44 Memory Chunks Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
Status	Object	True	Refer Section Resource 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 accesible 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.			
AddressRange OffsetMiB	Number	True	Offset of the memory chunk in the address range in MiB			
DisplayName	String	True	A user-configurable string to name the memory chunk			

3.6.36 MemoryMetrics

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

GET

Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Memory/{{Memory_instance}}/MemoryMetrics

or

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 45 Memory Metrics Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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.
			Name: BlocksRead; Type: Number; Read Only: True; Description: The number of blocks read since reset.
			Name: BlocksWritten; Type: Number; Read Only: True; Description: The number of blocks written since reset.
LifeTime	Object	True	The memory metrics since the last system reset.
			Name: BlocksRead; Type: Number; Read Only: True; Description: The number of blocks read for

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>the lifetime of the memory.</td></tr>
<tr><td></td><td></td><td></td><td>BlocksWritten</td><td>Number</td><td>True</td><td>The number of blocks written for the lifetime of the memory.</td></tr>
<tr><td>HealthData</td><td>Object</td><td>True</td><td colspan="4">This object shall contain properties which describe the HealthData metrics for the current resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>LastShutdownSuccess</td><td>Boolean</td><td>True</td><td>Status of last shutdown.</td></tr>
<tr><td>DataLossDetected</td><td>Boolean</td><td>True</td><td>Data loss detection status.</td></tr>
<tr><td>PerformanceDegraded</td><td>Boolean</td><td>True</td><td>Performance degraded mode status.</td></tr>
<tr><td>RemainingSpareBlockPercentage</td><td>Number</td><td>True</td><td>The remaining spare blocks, as a percentage.</td></tr>
<tr><td>AlarmTrips</td><td>Object</td><td>True</td><td>Alarm trip information about the memory. Refer Alarm Trips Table below.</td></tr>
<tr><td>PredictedMediaLifeLeftPercent</td><td>Number</td><td>True</td><td>The percentage of reads and writes that are predicted to still be available for the media.</td></tr>
</table></td></tr>
<tr><td>OperatingSpeedMHz</td><td>Number</td><td>True</td><td colspan="4">Operating speed of memory in MHz or MT/s as appropriate.</td></tr>
</table>

Table 46 Alarm Trips

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.

3.6.37 ProcessorMetrics

ProcessorMetrics contains usage and health statistics for a Processor (all Cores).

GET

Request

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

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 47 Processor Metrics Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Section Resource. **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. **NOTE** *Northbound only support.*
Cache	Array		The processor cache metrics. Refer Table Cache Propertie **NOTE** *Northbound only support.*
ConsumedPowerWatt	Number	True	The power consumed by the processor. **NOTE** *Northbound only support.*

CoreMetrics	Array		The processor core metrics. Refer Table CoreMetrics Properties **NOTE** *Northbound only support.*
FrequencyRatio	Number	True	The frequency relative to the nominal processor frequency ratio. **NOTE** *Northbound only support.*
KernelPercent	Number	True	The percentage of time spent in kernel mode. **NOTE** *Northbound only support.*
LocalMemoryBandwidthBytes	Number	True	The local memory bandwidth usage in bytes. **NOTE** *Northbound only support.*
RemoteMemoryBandwidthBytes	Number	True	The remote memory bandwidth usage in bytes. **NOTE** *Northbound only support.*
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. **NOTE** *Northbound only support.*

Table 48 Cache Properties

Name	Type	Read Only	Description
CacheMiss	Number	True	The number of cache line misses in millions.
CacheMissesPerInstruction	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 49 CacheMetries Properties

Name	Type	Read Only	Description
CoreCache	Array	True	The cache metrics of this core in the processor. Refer Table 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.

			Residency Percent	Number	True	The percentage of time that the processor or core has spent in this particular level of C-state.

3.6.38 AccelerationFunctions Collection

Refer Section Manager RedfishPowerSaveMode Action for a detailed information. We need corresponding AMI BIOS module support for the same.

GET

Request

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

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.6.39 AccelerationFunctions

GET

Request

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/Processors/{{{Processor_instance}}/AccelerationFunctions/{{AccelerationFunction_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 50 AccelerationFunction Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Table Resource Complex Types under Section Resource. **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.
			PCIeFunctions	Array	True	An array of references to the PCIeFunctions associated with this acceleration function.
			PCIeFunctions@odata.count	Number	True	The number of items in PCIeFunctions.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.			
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource for Resource.Oem.			

3.6.40 OperatingConfigs Collection

Refer Section 6.6 Manager RedfishPowerSaveMode Action for a detailed information. We need corresponding AMI BIOS module support for the same.

GET

Request

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

or

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}/Processors/{{ NetworkAdapter_processor_instance }}/OperatingConfigs

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.6.41 OperatingConfigs Instance

GET

Request

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/Processors/{{Processor_instance}}/OperatingConfigs/{{OperatingConfig_instance}}

or

https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}/Processors/{{NetworkAdapter_processor_instance}}/OperatingConfigs/{{OperatingConfig_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 51 OperatingConfig Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Section Resource. **NOTE**

<table>
<tr><td></td><td></td><td></td><td>This property will be a part of JSON response only if an oem property is implemented according to "How to Add OEM extensions" document.</td></tr>
<tr><td>Id(M)</td><td>String</td><td>True</td><td>Resource Identifier</td></tr>
<tr><td>Name(M)</td><td>String</td><td>True</td><td>Name of the Resource</td></tr>
<tr><td>Description</td><td>String</td><td>True</td><td>Description of the Resource</td></tr>
<tr><td>BaseSpeedMHz</td><td>Number</td><td>True</td><td>The base (nominal) clock speed of the processor in MHz.</td></tr>
<tr><td>MaxJunctionTemperatureCelsius</td><td>Number</td><td>True</td><td>The maximum temperature of the junction in degrees Celsius.</td></tr>
<tr><td>MaxSpeedMHz</td><td>Number</td><td>True</td><td>The maximum clock speed to which the processor can be configured in MHz.</td></tr>
<tr><td>TDPWatts</td><td>Number</td><td>True</td><td>The thermal design point of the processor in watts.</td></tr>
<tr><td>TotalAvailableCoreCount</td><td>Number</td><td>True</td><td>The number of cores in the processor that can be configured.</td></tr>
<tr><td>TurboProfile</td><td>Array of objects</td><td></td><td>The turbo profiles for the processor. A turbo profile is the maximum turbo clock speed as a function of the number of active cores.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>MaxSpeedMHz</td><td>Number</td><td>True</td><td>The number of active cores to be configured with the specified maximum clock speed.</td></tr>
<tr><td>ActiveCoreCount</td><td>Number</td><td>True</td><td>The maximum turbo clock speed that correspond to the number of active cores in MHz.</td></tr>
</table></td></tr>
<tr><td>BaseSpeedPrioritySettings</td><td>Array of objects</td><td>True</td><td>This type shall specify the clock speed for a set of cores.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>BaseSpeedMHz</td><td>Number</td><td>true</td><td>The clock speed to configure the set of cores in MHz.</td></tr>
<tr><td>CoreCount</td><td>Array of numbers</td><td>true</td><td>The number of cores to configure with a specified speed.</td></tr>
</table></td></tr>
</table>

3.6.42 StorageControllers Collection

Refer Section Manager RedfishPowerSaveMode Action for a detailed information. We need corresponding AMI BIOS module support for the same.

GET

Request

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage/{{Storage_instance}}/Controllers

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.6.43 StorageControllers Instance

GET

Request

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/Storage/{{Storage_instance}}/Controllers/{{Controllers_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 52 StorageControllers Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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
AssetTag	String	True	The user-assigned asset tag for this storage controller.
FirmwareVersion	String	True	The firmware version of this storage controller.
Manufacturer	String	True	The manufacturer of this storage controller.

<table>
<tr><td>Model</td><td>String</td><td>True</td><td>The model number for the storage controller.</td></tr>
<tr><td>SerialNumber</td><td>String</td><td>True</td><td>The serial number for this storage controller.</td></tr>
<tr><td>SpeedGbps</td><td>number</td><td>True</td><td>The maximum speed of the storage controller’s device interface.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>The status and health of the resource and its subordinate or dependent resources.</td></tr>
<tr><td>SupportedControllerProtocols</td><td>array of string</td><td>True</td><td>The supported set of protocols for communicating to this storage controller. Refer Table Protocol Properties.</td></tr>
<tr><td>SupportedDeviceProtocols</td><td>array of string</td><td>True</td><td>The protocols that the storage controller can use to communicate with attached devices. Refer Table Protocol Properties.</td></tr>
<tr><td>SupportedRAIDTypes</td><td>array of string</td><td>True</td><td>The set of RAID types supported by the storage controller.</td></tr>
<tr><td>NVMeControllerProperties</td><td>Object</td><td>True</td><td>This property shall contain NVMe related properties for this storage controller.
NOTE
This property is populated by Host Interface as part of Inventory when NVMe drive is connected. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information).
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>MaxQueueSize</td><td>Number</td><td>True</td><td>The maximum Individual queue size that an NVMe IO controller supports.</td></tr>
<tr><td>NVMeVersion</td><td>string</td><td>True</td><td>The version of the NVMe Base Specification supported.”</td></tr>
</table></td></tr>
</table>

3.6.44 USBControllers Collection

It displays the collection of USB Controllers resources instances available in the system. We need corresponding AMI BIOS module support for the same.

GET

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/USBControllers
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.6.45 StorageControllers Instance

GET

Request

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/USBControllers/{{USBController_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 53 USBControllers properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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
Links	Object	True	The links to other resources that are related to this resource.

Name	Type	Read only	Description
PCIeDevice	Object	True	A link to the PCIe device that represents this usb controller.
Processors	Array of Object	True	An array of links to the processors that are a part of this usb controller.
Processors @odata.count	Number	True	Number of Processor Instance connected that are part of this usb controller.

Manufacturer	String	True	The manufacturer of this usb controller.
Model	String	True	The product model number of this usb controller.
PartNumber	String	True	The part number for this usb controller.
Ports	Object	True	This property shall contain a link to a resource collection of type PortCollection.

SKU	String	True	The SKU for this usb controller.
SerialNumber	String	True	The serial number for this usb controller.
SparePartNumber	String	True	The spare part number of the usb controller.
Status	Object	True	The status and health of the resource and its subordinate or dependent resources.

3.6.46 GraphicsControllers Collection

It displays the collection of GraphicControllers resources instances available in the system. We need corresponding AMI BIOS module support for the same.

GET

Request

```
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/GraphicsControllers
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.6.47 GraphicsControllers Instance

GET

Request

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/GraphicsControllers/{{GraphicsControllers_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 54 Graphicsontrollers properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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
AssetTag	String	True	The user-assigned asset tag for this graphics controller.
BiosVersion	String	True	The version of the graphics controller BIOS or primary graphics controller firmware.
DriverVersion	String	True	The version of the graphics controller driver loaded in the operating system.
Links	Object	True	The links to other resources that are related to this resource.

Name	Type	Read only	Description
PCIeDevice	Object	True	A link to the PCIe device that represents this graphics controller.
Processors	Array of Object	True	An array of links to the processors that are a part of this graphics controller.

			Processors@odata.count	Number	True	Number of Processor instance connected that are part of this graphics controller.
Location	Object	True	Refer for Table Resource schema properties			
Manufacturer	String	True	The manufacturer of this graphics controller.			
Model	String	True	The product model number of this graphics controller.			
PartNumber	String	True	The part number for this graphics controller.			
Ports	Object	True	This property shall contain a link to a resource collection of type PortCollection.			
SKU	String	True	The SKU for this graphics controller.			
SerialNumber	String	True	The serial number for this graphics controller.			
SparePartNumber	String	True	The spare part number of the graphics controller.			
Status	Object	True	The status and health of the resource and its subordinate or dependent resources.			

3.7 Chassis API

3.7.1 Chassis Collection

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

GET

Request

```
https://{{ip}}/redfish/v1/Chassis
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.7.2 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.

GET

Request

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

Response

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

Table 56 Chassis Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource **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

			Resource
ChassisType(M)	String	True	ChassisType shall indicate the physical form factor for the type of chassis. Refer Table 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. Please refer Chassis under Platform specific Properties in "How to Add OEM extensions" document.*
Sensors	Object	True	The navigation pointer to the Please refer section PCIeSlots in MegaRAC Redfish - Technology Pack User Guide for more information Sensor Collection located in the equipment and subcomponents.
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 extensions" 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 extensions" document.*
PCIeDevices	Object	True	An references to the PCIe Devices Collection located in this Chassis.
PCIeSlots	Object	True	An references to the PCIeSlots resource for Chassis.
MediaControllers	Object	True	An references to the MediaControllers Collection located in this Chassis.
AssetTag	String	False	The user assigned asset tag for this chassis. Default it will be null value
Assembly	Object	True	The link to the assembly associated with this Chassis. **NOTE**

<table>
<tr><td></td><td></td><td></td><td>Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.</td></tr>
<tr><td>UUID</td><td>String</td><td>True</td><td>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 extensions" document.</td></tr>
<tr><td>IndicatorLED</td><td>String</td><td>False</td><td>The state of the indicator LED, used to identify the chassis.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>Lit</td><td>The Indicator LED is lit.</td></tr><tr><td>Blinking</td><td>The Indicator LED is blinking.</td></tr><tr><td>Off</td><td>The Indicator LED is off.</td></tr></table></td></tr>
<tr><td>IndicatorLED@Redfish.AllowableValues</td><td>Array</td><td>True</td><td>This attribute will list the allowed enum values(i.e. Lit, Blinking and Off) for the IndicatorLED attribute.</td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td>The links object contains the links to other resources that are related to this resource. Refer Table Chassis Links Properties.</td></tr>
<tr><td>LogServices (N)</td><td>Object</td><td>True</td><td>A reference to a collection of Logs used by the Chassis.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>The Actions object contains the available custom actions on this resource like Chassis.Reset and OemActions if any.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Status.</td></tr>
<tr><td>Thermal(N)</td><td>Object</td><td>True</td><td>A reference to the thermal properties (fans, cooling, sensors) for this chassis.</td></tr>
<tr><td>ThermalSubsystem(N)</td><td>Object</td><td>True</td><td>A reference to the thermalsubsystem properties (fanredundancy, fans, thermalmetrics) for this chassis.</td></tr>
<tr><td>Power(N)</td><td>Object</td><td>True</td><td>A reference to the power properties (power supplies, power policies, sensors) for this chassis.</td></tr>
<tr><td>PowerSubsystem(N)</td><td>Object</td><td>True</td><td>A reference to the powersubsystem properties (powersupplyredundancy, power supplies, capacitywatts) for this chassis.</td></tr>
<tr><td>PowerState</td><td>String</td><td>True</td><td>This is the current power state of the chassis.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>On</td><td>The components within the chassis has power on.</td></tr><tr><td>Off</td><td>The components within the chassis has no power, except some components may continue to have AUX power such as management controller.</td></tr></table></td></tr>
<tr><td>Location</td><td>Object</td><td>True</td><td>Refer for Table Resource 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.</td></tr>
<tr><td>HeightMm</td><td>Number</td><td>True</td><td>The height of the chassis.
NOTE
Northbound is supported and platform specific porting needed; require specific platform libraries support and</td></tr>
</table>

			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 Table Collection Properties **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.*
MediaControllers	Object	True	An references to the MediaControllers Collection located in this Chassis.
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	Descriptioni
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 56 Chassis Type Enum Properties

Chassis Type	
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 equipment 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 57 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 extensions" document.*
Drives@odata.count	Number	True	An integer representing the number of items in a collection.
Storage(N)	Array	True	An array of references to the storage subsystems connected to or inside 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.*
Storage@odata.count	Number	True	An integer representing the number of items in a collection.
ResourceBlocks(N)	Array	True	An array of references to the Resource Blocks 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 extensions" document.*
ResourceBlocks@odata.count	Number	True	An integer representing the number of items in a collection.
ContainedBy(N)	Array	True	A reference to the chassis that this chassis is

			contained by. **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.*
Contains(N)	Array	True	An array of references to any other chassis that this chassis has in it. **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.*
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 extensions" 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 extensions" 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 extensions" 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 extensions" document.*
Processors@odata.count	Number	True	An integer representing the number of items in a collection.

PATCH

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

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

POST

Request

```
POSThttps://{{ip}}/redfish/v1/ Chassis/{{system_instance}}/Actions/Chassis.Reset
Content-Type: application/json
```

Request Body:
The ResetType can be one of the following values: ‘‘On’’, ‘‘ForceOff’’, ‘‘GracefulShutdown’’, ‘‘ForceRestart’’, ‘‘PowerCycle’’.

Example POST Request Body:

```
{
   ‘‘ResetType’’ : ‘‘On’’
}
```

Response

The response status is 202 with below body.

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

For Error Responses refer Section ‘‘Redfish Error Response’’ and Section ‘‘Status Codes’’.

3.7.3 Power

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

GET

Request

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

Content-Type: application/json

Response

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

Table 58 Power Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
PowerControl(N)	Array	False	This is the definition for power control function (power reading/limiting). Refer Table 59 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 Voltages Properties below.
Voltages@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 extensions" document.*
Redundancy@odata.count	Number	True	An integer representing the number of items in a collection.
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.

Table 59 PowerControl Properties

Name	Type	Read Only	Description
@odata.id	String	True	Refer Section ODATA Properties
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	Thetotal 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 IntervalInMin is Minute.*
			MinConsumedWatts	Number	The lowest power consumption level over the measurement window (the last IntervalInMin minutes). Minimum Value:0
			MaxConsumedWatts	Number	The highest power consumption level that has occurred over the measurement window (the last IntervalInMin minutes). Minimum Value:0
			AverageConsumedWatts	Number	The average power level over the measurement window (the last IntervalInMin minutes). Minimum Value:0
PowerLimit	Object	False	Power limit status and configuration information for this chassis. **NOTE** *Active power limit should be enabled in order to get the power limit values.*		
			Attribute	Type	Description
			LimitInWatts	Number	The Power limit in watts. Minimum Value: 0. **NOTE** *The value of this property can be in the range of 0 to 65535.*
			LimitException	String	The action that is taken if the power cannot be

					maintained below the LimitInWatts. Refer Table 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. **NOTE** *The value of this property can be in the range of 0 to 4294967295.*
RelatedItem (C)	Array	True	The ID(s) of the resources associated with this Power Limit **NOTE** *Northbound only supported*		
RelatedItem@odata.count	Number	True	Number of RelatedItems **NOTE** *Northbound only supported*		
PhysicalContext (C)	String	True	The value of this property shall be a description of the affected device or region within the chassis to which this power control measurement applies. Refer Table 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.*		

Table 60 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 61 Voltages Properties

Name	Type	Read Only	Description
@odata.id	String	True	Refer Section ODATA Properties **NOTE** *The "@odata.id" identifier shall start with 0 and "MemberId" property shall have the same value as the identifier.*
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 Resource 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 propoerty.
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.*
Oem	Object	True	Specifies the AMI defined OEM properties and other OEM properties(if implemented accordingly). 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 Section Power OEM Properties
PhysicalContext(C)	Object	True	The affected device or region within the chassis to which this voltage measurement applies.(Refer Table 64 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. **NOTE** *Northbound only supported*
RelatedItem@odata.count	Number	True	Number of RelatedItems. **NOTE** *Northbound only supported*

PATCH

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

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.7.4 Thermal

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

GET

Request

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

Content-Type: application/json

Response

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

Table 62 Thermal Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
Temperatures	Array of Objects	True	This is the definition for temperature sensors. Refer Table Temperature Properties.
Fans	Array of Objects	True	This is the definition for fans. Refer Table 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 extensions" document.*
Actions	Objects	True	The Actions object contains the available custom actions on this resource like OemActions if any.

Table 63 Temperature Properties

Name	Type	Read Only	Description
@odata.id	String	True	Refer Section ODATA Properties Section 3.1 **NOTE** *The "@odata.id" identifier shall start with 0 and "MemberId" property shall have the same value as the identifier.*
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 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 Resource 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. **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.*
MaxReadingRangeTemp	Number	True	The highest possible value for CurrentReading. Units shall use the same units as the related ReadingCe;sius property. **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.
Oem	Object	True	Specifies the AMI defined OEM properties and other OEM properties(if implemented accordingly). **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 Section Thermal OEM Properties*
PhysicalContext(C)	String	True	The affected device or region within the chassis to which this Temperature measurement applies.Refer Table 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. The value based on Entity Id as per IPMI Specification ,if Entity ID is 0x03 then Physical context is CPU,if Entity ID is 0x07 then Physical Context is SystemBorad,for Other values physical context is Intake.*
RelatedItem (C)	Array	True	The ID(s) of the resources associated with this Power Limit
RelatedItem@odata.count	Number	True	Number of RelatedItems **NOTE** *Northbound only supported*
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	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. **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.*
AdjustedMaxAllowableOperatingValue	Number	True	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. **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.*
AdjustedMinAllowableOperatingValue	Number	True	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. **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.*

Table 64 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 65 Fan Properties

Name	**Type**	**Read Only**	**Description**
@odata.id	String	True	Refer Section ODATA Properties
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.
Oem	Object	True	Specifies the AMI defined OEM properties and other OEM properties (if implemented accordingly). **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 Section Thermal OEM Properties
PhysicalContext(C)	String	True	The affected device or region within the chassis to which this RPM measurement applies.Refer Table ThermalPhysicalContextEnum Properties.
Status	Object	True	Refer Section Resource for Resource.Oem.
Reading	Number	True	The current value of the fan sensor's reading. NOTE *If Host is Off or Sensor in Absent or Disabled state the value ill not be shown in response*

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.*
MaxReadingRange	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.
RelatedItem@odata.count	Number	True	Number of RelatedItems **NOTE** *Northbound only supported*
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 hotpluggable. **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 Resource 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.

3.7.5 ThermalSubsystem

This resource contains the ThermalSubsystem for the Chassis.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/<chassis_instance>/ThermalSubsystem
Content-Type: application/json
```

Response

Please refer Section 3.5 for the JSON response properties.

Table 66 Properties table for ThermalSubsystem

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource
Status	Object	True	Refer Section Resource for Resource.Oem.
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.
FanRedundancy	Array of objects	True	This property shall contain redundancy information for the groups of fans in this subsystem. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*

Name	Type	Read only	Description
MaxSupportedInGroup	Number	True	The maximum number of devices supported in this redundancy group.
MinNeededInGroup	Number	True	The minimum number of devices needed for this group to be redundant.
Status	Object	True	The status and health of the resource and its subordinate or dependent resources.
RedundancyType	String	True	The redundancy mode of the group.

						Enum	Description
						Failover	Failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions.
						NPlusM	Multiple units are available and active such that normal operation will continue if one or more units fail.
						Sharing	The subsystem is not configured in a redundancy mode, either due to configuration or the functionality has been disabled by the user.
						Sparing	Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail.
						NotRedundant	One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.
			RedundancyGroup@odata.count	Number	True	Number of items in redundancy	
			RedundancyGroup	Array	True	The links to the devices included in this redundancy group.	
Fans	Object	True	The link to the collection of fans within this subsystem.				
ThermalMetrics	Object	True	The link to the summary of thermal metrics for this subsystem.				

3.7.6 Fans Collection

It displays the collection of Fans resource instances available in the Chassis.

GET

Request

https://{{ip}}/redfish/v1/Chassis/<ChassisInstance>/ThermalSubsystem/Fans
Content-Type: application/json

Response

Please refer Section 3.5 for the JSON response properties.

3.7.7 Fans Instance

This is the schema definition for the Fan resource.

GET

Request

https://{{ip}}/redfish/v1/Chassis/<ChassisInstance>/ThermalSubsystem/Fans/<FanInstance>
Content-Type: application/json

Response

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

Table 67 Properties table for Fan resource

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource
HotPluggable	Boolean	True	An indication of whether this device can be inserted or removed while the equipment is in operation. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*

<table>
<tr><td></td><td></td><td></td><td>should be added.</td></tr>
<tr><td>Location</td><td>Object</td><td>True</td><td>The location of the fan.
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.</td></tr>
<tr><td>LocationIndicatorActive</td><td>Boolean</td><td>True</td><td>An indicator allowing an operator to physically locate this resource.
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.</td></tr>
<tr><td>Manufacturer</td><td>String</td><td>True</td><td>The manufacturer of this fan.
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.</td></tr>
<tr><td>Model</td><td>String</td><td>True</td><td>The model number for this fan.
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.</td></tr>
<tr><td>PartNumber</td><td>String</td><td>True</td><td>The part number for this fan.
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.</td></tr>
<tr><td>PhysicalContext</td><td>String</td><td>True</td><td>The area or device associated with this fan.</td></tr>
<tr><td>SerialNumber</td><td>String</td><td>True</td><td>The serial number for this fan.
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.</td></tr>
<tr><td>SparePartNumber</td><td>String</td><td>True</td><td>The spare part number for this fan.
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.</td></tr>
<tr><td>SpeedPercent</td><td>Object</td><td>True</td><td>The fan speed (percent).
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>DataSourceUri</td><td>String</td><td>True</td><td>The link to the resource that provides the data for this</td></tr>
</table>
</td></tr>
</table>

						sensor
			Reading	Number	True	The sensor value.
			SpeedRPM	Number	True	The rotational speed.
Status	Object	True	Refer Section Resource for Resource.Oem.			
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.			

3.7.8 ThermalMetrics

This resource contains the ThermalMetrics for the Chassis.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/<chassis_instance>/ThermalSubsystem/ThermalMetrics
Content-Type: application/json
```

Response

Please refer Section 3.5 for the JSON response properties.

Table 68 Properties table for ThermalMetrics

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource
Temperature ReadingsCelsius	Array of objects	True	The temperatures (Celsius) from all related sensors for this device.
TemperatureReadingsCelsius@odata.count	Number	True	Number of items in TemperatureReadingsCelsius
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.

Temperature ReadingsCelsius — nested table:

Name	Type	Read only	Description
DataSourceUri	Object	True	The link to the resource that provides the data for this sensor.
DeviceName	String	True	The name of the device.
Physical Context	String	True	The area or device to which this sensor measurement applies.
Reading	Number	True	The sensor value.

3.7.9 PowerSubsystem

This resource contains the PowerSubsystem for the Chassis.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/<chassis_instance>/PowerSubsystem
Content-Type: application/json
```

Response

Please refer Section 3.5 for the JSON response properties.

Table 69 Properties table for PowerSubsystem

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Resource. **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 Resource
Status	Object	True	Refer Section Resource for Resource.Oem.
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.
PowerSupply Redundancy	Array of objects	True	This property shall contain redundancy information for the groups of Power Supplies in this subsystem. **NOTE** *Northbound only Supported. Platform specific porting needed; require specific platform libraries support and hook.*

Name	Type	Read only	Description
MaxSupportedInGroup	Number	True	The maximum number of devices supported in this redundancy group.
MinNeededInGroup	Number	True	The minimum number of devices needed for this group to be redundant.
Status	Object	True	The status and health of the resource and its subordinate or dependent resources.
RedundancyType	String	True	The redundancy mode of the group. **NOTE**

						RedundancyType default value is Failover. 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 2.1 Power Redundancy.	
						Enum	Description
						Failover	Failure of one unit automatically causes a standby or offline unit in the redundancy set to take over its functions.
						NPlusM	Multiple units are available and active such that normal operation will continue if one or more units fail.
						Sharing	The subsystem is not configured in a redundancy mode, either due to configuration or the functionality has been disabled by the user.
						Sparing	Multiple units contribute or share such that operation will continue, but at a reduced

<table>
<tr><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td></td><td>capacity, if one or more units fail.</td></tr>
<tr><td>NotRedundant</td><td>One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.</td></tr>
<tr><td>RedundancyGroup@odata.count</td><td>Number</td><td>True</td><td colspan="2">Number of items in redundancy</td></tr>
<tr><td>RedundancyGroup</td><td>Array</td><td>True</td><td colspan="2">The links to the devices included in this redundancy group.</td></tr>
<tr><td>PowerSupplies</td><td>Object</td><td>True</td><td colspan="6">The link to the collection of power supplies within this subsystem.</td></tr>
<tr><td>CapacityWatts</td><td>Number</td><td>True</td><td colspan="6">The total amount of power that can be allocated to this subsystem.</td></tr>
<tr><td>Allocation</td><td>Object</td><td>True</td><td colspan="6">Power allocation for this subsystem.
NOTE
This property will not be displayed in the response, if the value from back-end is not applicable.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>AllocatedWatts</td><td>Number</td><td>True</td><td>The total amount of power that has been allocated or budgeted to this subsystem.
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.</td></tr>
<tr><td>RequestedWatts</td><td>Number</td><td>True</td><td>The potential power, in watts, that the subsystem requests, which might be higher than the current level being consumed because the requested power includes a budget that the</td></tr>
</table></td></tr>
</table>

						subsystem wants for future use. **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.*

3.7.10 PowerSupplies Collection

It displays the collection of power supply resource instances available in the Chassis.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/<ChassisInstance>/PowerSubsystem/PowerSupplies
Content-Type: application/json
```

Response

Please refer Section 3.5 for the JSON response properties.

3.7.11 PowerSupply Instance

This is the schema definition for the power supply resource.

GET

Request

https://{{ip}}/redfish/v1/Chassis/<ChassisInstance>/PowerSubsystem/PowerSupplies/<PS_instance>

Content-Type: application/json

Response

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

Table 70 Properties table for PowerSupply

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.context</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.id</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.etag</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>Refer Resource Complex Types under Section Resource.
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.</td></tr>
<tr><td>Id(M)</td><td>String</td><td>True</td><td>Resource Identifier</td></tr>
<tr><td>Name(M)</td><td>String</td><td>True</td><td>Name of the Resource</td></tr>
<tr><td>Description</td><td>String</td><td>True</td><td>Provides description of the resource. Refer Section Resource</td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td>The links object contains the links to other resources that are related to this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>PowerOutlets@odata.count</td><td>Number</td><td>True</td><td>Number of PowerOutlets</td></tr>
</table></td></tr>
<tr><td>Metrics</td><td>Object</td><td>True</td><td>The Metrics object contains the links to Metrics resources that are related to this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>@odata.id</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
</table></td></tr>
<tr><td>HotPluggable</td><td>Boolean</td><td>True</td><td>An indication of whether this device can be inserted or removed while the equipment is in operation.
NOTE
Northbound only properties. Platform specific</td></tr>
</table>

			porting needed; require specific platform libraries support and hook between the specific libraries and gami module
Location	Object	True	The location of the power supply. Refer Table Properties table for Location.
LocationIndicatorActive	Boolean	True	An indicator allowing an operator to physically locate this resource. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*
Manufacturer	String	True	The manufacturer of this power supply. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*
Model	String	True	The model number for this power supply. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*
PartNumber	String	True	The part number for this power supply. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*
Status	Object	True	Refer Section Resource for Resource.Oem.
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.
SerialNumber	String	True	The serial number for this power supply. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*
SparePartNumber	String	True	The spare part number for this power supply. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*
FirmwareVersion	String	True	The firmware version for this power supply. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*

<table>
<tr><td>PowerSupplyType</td><td>String</td><td>True</td><td>The power supply type (AC or DC)
NOTE
Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module<table><tr><th>Enum</th><th>Description</th></tr><tr><td>AC</td><td>Alternating Current (AC) power supply.</td></tr><tr><td>DC</td><td>The power supply supports both DC or AC.</td></tr><tr><td>AC or DC</td><td>Direct Current (DC) power supply</td></tr></table></td></tr>
<tr><td>PowerCapacityWatts</td><td>Number</td><td>True</td><td>The maximum capacity of this power supply.
NOTE
Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module</td></tr>
<tr><td>InputNominalVoltageType</td><td>String</td><td>True</td><td>The nominal voltage type of the line input to this power supply.
NOTE
Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module<table><tr><th>Enum</th><th>Description</th></tr><tr><td>AC100To127V</td><td>AC 100-127V nomina</td></tr><tr><td>AC100To240V</td><td>AC 100-240V nominal.</td></tr><tr><td>AC100To277V</td><td>AC 100-277V nominal.</td></tr><tr><td>AC120V</td><td>AC 120V nominal</td></tr><tr><td>AC200To240V</td><td>AC 200-240V nominal.</td></tr><tr><td>AC200To277V</td><td>AC 200-277V nominal.</td></tr><tr><td>AC208V</td><td>AC 208V nominal.</td></tr><tr><td>AC230V</td><td>AC 230V nominal.</td></tr><tr><td>AC240V</td><td>AC 240V nominal.</td></tr><tr><td>AC240AndDC380V</td><td>AC 200-240V and DC 380V</td></tr><tr><td>AC277V</td><td>AC 277V nominal.</td></tr><tr><td>AC277AndDC380V</td><td>AC 200-277V and DC 380V</td></tr><tr><td>AC400V</td><td>AC 400V or 415V nominal.</td></tr><tr><td>AC480V</td><td>AC 480V nominal.</td></tr><tr><td>DC48V</td><td>DC 48V nominal.</td></tr><tr><td>DC240V</td><td>DC 240V nominal</td></tr><tr><td>DC380V</td><td>High Voltage DC (380V)</td></tr><tr><td>DCNeg48V</td><td>-48V DC.</td></tr><tr><td>DC16V</td><td>DC 16V nominal.</td></tr><tr><td>DC12V</td><td>DC 12V nominal</td></tr><tr><td>DC9V</td><td>DC 9V nominal.</td></tr><tr><td>DC5V</td><td>DC 5V nominal.</td></tr><tr><td>DC3_3V</td><td>DC 3.3V nominal.</td></tr><tr><td>DC1_8V</td><td>DC 1.8V nominal.</td></tr></table></td></tr>
<tr><td>EfficiencyPercent</td><td>Number</td><td>True</td><td>The rated efficiency of this power supply at the</td></tr>
</table>

			specified load. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*
RelatedItem@odata.count	Number	True	Number of RelatedItems **NOTE** *Northbound only supported*

Table 71 Properties table for Location

Name	Type	Read Only	Description
PartLocation	Object	True	Postal address of the addressed resource. **NOTE** *Northbound only supported*

Name	Type	Read only	Description
LocationType	String	True	The type of location of the part, such as embedded.

3.7.12 PowerSupplyMetrics

This resource contains the Metrics for the PowerSupply.

GET

Request

https://{{ip}}/redfish/v1/Chassis/<chassis_instance>/PowerSubsystem/PowerSupplies/<instance>/Metrics

Content-Type: application/json

Response

Please refer Section 3.5 for the JSON response properties.

NOTE
If the power reading value is not nil then only the metrics URI will show in powersupplies instance. Otherwise it will not show the metrics uri in the powersupplies instance

Table 72 Properties table for PowerSupplyMetrics

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Section Resource. **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 Resource
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.
OutputPowerWatts	Object	True	The total power output (W) for this power supply. **NOTE** *Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module*

Name	Type	Read only	Description
DataSourceUri	Object	True	The link to the resource that provides the data for this sensor.
Reading	Number	True	The sensor value.

Temperature Celsius	Object	True	The temperature (C) for this power supply. **NOTE** *Northbound only properties. Platform specific porting*

<table>
<tr><td></td><td></td><td></td><td>
needed; require specific platform libraries support and hook between the specific libraries and gami module
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>DataSourceUri</td><td>Object</td><td>True</td><td>The link to the resource that provides the data for this sensor.</td></tr>
<tr><td>Reading</td><td>Number</td><td>True</td><td>The sensor value.</td></tr>
</table>
</td></tr>
<tr><td>FanSpeedPercent</td><td>Object</td><td>True</td><td>
The fan speed (percent) for this power supply.
NOTE
Northbound only properties. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>DataSourceUri</td><td>Object</td><td>True</td><td>The link to the resource that provides the data for this sensor.</td></tr>
<tr><td>Reading</td><td>Number</td><td>True</td><td>The sensor value.</td></tr>
<tr><td>SpeedRPM</td><td>Number</td><td>True</td><td>The rotational speed.</td></tr>
</table>
</td></tr>
</table>

3.7.13 NetworkDeviceFunctionCollection

It displays the collection of NetworkDeviceFunction resource instances.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/NetworkDeviceFunctions

https://{{ip}}/redfish/v1/Systems/{{system_instance}}/NetworkInterfaces/{{NetworkInterface_instance}}/NetworkDeviceFunctions

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.7.14 NetworkDeviceFunction

A Network Device Function represents a logical interface exposed by the network adapter.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/NetworkDeviceFunctions/{{NetworkDeviceFunctions_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 73 NetworkDeviceFunction

Name	Type	Read Only	Description
@Redfish.Settings	Object	True	A Reference to the FutureState URI for this resource. Name: SettingsObject; Type: Object; Read only: True; Description: A reference to the FutureState URI for this resource. **NOTE** *This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information).*
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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

<table>
<tr><td>Name(M)</td><td>String</td><td>True</td><td>Name of the Resource</td></tr>
<tr><td>Description</td><td>String</td><td>True</td><td>Provides description of the resource. Refer Section Resource</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Oem.</td></tr>
<tr><td>NetDevFuncType</td><td>String</td><td>True</td><td>The configured capability of this network device function.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Disabled</td><td>Neither enumerated nor visible to the operating system.</td></tr>
<tr><td>Ethernet</td><td>Appears to the operating system as an Ethernet device.</td></tr>
<tr><td>FibreChannel</td><td>Appears to the operating system as a Fibre Channel device.</td></tr>
<tr><td>iSCSI</td><td>Appears to the operating system as an iSCSI device.</td></tr>
<tr><td>InfiniBand</td><td>Appears to the operating system as an InfiniBand device.</td></tr>
<tr><td>FibreChannelOver Ethernet</td><td>Appears to the operating system as an FCoE device.</td></tr>
</table></td></tr>
<tr><td>DeviceEnabled</td><td>Boolean</td><td>True</td><td>Whether the network device function is enabled. Disabled network device functions shall not be enumerated or seen by the operating system.</td></tr>
<tr><td>NetDevFuncCapabilities</td><td>Array</td><td>True</td><td>Capabilities of this network device function. Array Items are of Type NetDevFuncType.</td></tr>
<tr><td>Ethernet</td><td>Object</td><td></td><td>This object shall contain Ethernet capabilities, status, and configuration values for this network device function.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>PermanentMACAddress</td><td>String</td><td>True</td><td>This is the permanent MAC address assigned to this network device function (physical function).</td></tr>
<tr><td>MACAddress</td><td>String</td><td>True</td><td>This is the currently configured MAC address of the (logical port) network device function.</td></tr>
<tr><td>VLANs</td><td>Object</td><td>True</td><td>This is a reference to a collection of VLANs and is only used if the interface supports more than one VLANs.</td></tr>
<tr><td>MTUSize</td><td>Number</td><td>True</td><td>The Maximum Transmission Unit (MTU) configured for this network device function.</td></tr>
</table></td></tr>
<tr><td>iSCSIBoot</td><td>Object</td><td>False</td><td>This object shall contain iSCSI boot capabilities, status, and configuration values for this network device function. Please refer Table iSCSIBoot Properties.</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>NOTE
The ISCSIBoot attributes can be deleted / removed by patching null value to each property inside ISCSIBoot object.</td></tr>
<tr><td>FibreChannel</td><td>Object</td><td>True</td><td>This object shall contain Fibre Channel capabilities, status, and configuration values for this network device function.
Please refer Table FibreChannel Properties.</td></tr>
<tr><td>BootMode</td><td>String</td><td>False</td><td>The boot mode configured for this network device function. Allowable values are as following
NOTE
Redfish.AllowableValues array should always be shown to indicate the supported allow values
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Disabled</td><td>Do not indicate to UEFI/BIOS that this device is bootable.</td></tr>
<tr><td>PXE</td><td>Boot this device using the embedded PXE support. Only applicable if the NetworkDeviceFunctionType is set to Ethernet.</td></tr>
<tr><td>iSCSI</td><td>Boot this device using the embedded iSCSI boot support and configuration. Only applicable if the NetworkDeviceFunctionType is set to iSCSI.</td></tr>
<tr><td>FibreChannel</td><td>Boot this device using the embedded Fibre Channel support and configuration. Only applicable if the NetworkDeviceFunctionType is set to FibreChannel.</td></tr>
<tr><td>FibreChannel OverEthernet</td><td>Boot this device using the embedded Fibre Channel over Ethernet (FCoE) boot support and configuration. Only applicable if the NetworkDeviceFunctionType is set to FibreChannelOverEthernet.</td></tr>
</table></td></tr>
<tr><td>VirtualFunctionsEnabled</td><td>Boolean</td><td>True</td><td>Whether Single Root I/O Virtualization (SR-IOV) Virual Functions (VFs) are enabled for this Network Device Function.</td></tr>
<tr><td>MaxVirtualFunctions</td><td>Number</td><td>True</td><td>The number of virtual functions (VFs) that are available for this Network Device Function.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>The Actions object contains the available custom actions on this resource like OemActions if any.</td></tr>
<tr><td>AssignablePhysicalPorts@odata.count</td><td>Number</td><td>True</td><td>Number of AssignablePhysicalPorts availale.</td></tr>
<tr><td>AssignablePhysicalNetworkPorts</td><td>Array</td><td>True</td><td>An array of physical ports to which this network device function can be assigned.</td></tr>
<tr><td>AssignablePhysicalNetworkPorts@odata.count</td><td>Number</td><td>True</td><td>Number of AssignablePhysicalNetworkPorts available</td></tr>
<tr><td>InfiniBand</td><td>Object</td><td>True</td><td>This type describes InifiniBand capabilities, status, and configuration of a network device function.
Please refer to Table InfiniBand Properties.</td></tr>
</table>

<table>
<tr><td rowspan="7">Links</td><td rowspan="7">Object</td><td rowspan="7">True</td><td colspan="4">Links for this controller.<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Endpoints@odata.count</td><td>Number</td><td>True</td><td>An integer representing the number of items in a collection.</td></tr>
<tr><td>Endpoints</td><td>Array</td><td>True</td><td>An array of references to endpoints associated with this network device function.

The type shall contain an array property who’s members reference resources, of type Endpoint, which are associated with this network device function.</td></tr>
<tr><td>PhysicalPortAssignment</td><td>Object</td><td>True</td><td>The physical port that this network device function is currently assigned to.</td></tr>
<tr><td>PhysicalNetworkPortAssignment</td><td>Object</td><td>True</td><td>The physical port to which this network device function is currently assigned.</td></tr>
<tr><td>EthernetInterface</td><td>Object</td><td>True</td><td>The link to a virtual Ethernet interface that was created when one of the network device function VLANs is represented as a virtual NIC for the purpose of showing the IP address associated with that VLAN.</td></tr>
<tr><td>PCIeFunction</td><td>Object</td><td>True</td><td>A reference to the collection of members of this collection.
NOTE
Will be populated through Host Interface.</td></tr>
</table></td></tr>
</table>

Table 74 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: IPv4 — IPv4 addressing is used for all IP-fields in this object. Enum: 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
InitiatorDefault Gateway	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
PrimaryTargetIP Address	String	False	The IP address (IPv6 or IPv4) for the primary iSCSI boot target. Default it will be null value
PrimaryTargetTCP Port	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
SecondaryTarget Name	String	False	The name of the iSCSI secondary boot target. Default it will be null value
SecondaryTarget IPAddress	String	False	The IP address (IPv6 or IPv4) for the secondary iSCSI boot target. Default it will be null value
SecondaryTarget TCPPort	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
SecondaryVLAN Enable	Boolean	False	This indicates if the secondary VLAN is enabled. Default it will be null value

<table>
<tr><td>SecondaryVLAN Id</td><td>Number</td><td>False</td><td>The 802.1q VLAN ID to use for iSCSI boot from the secondary target. Default it will be null value
Minimum = ‘‘0’’
Maximum = ‘‘4094’’</td></tr>
<tr><td>SecondaryDNS</td><td>String</td><td>False</td><td>The IPv6 or IPv4 address of the secondary DNS server for the iSCSI boot initiator. Default it will be null value</td></tr>
<tr><td>IPMaskDNSViaDHCP</td><td>Boolean</td><td>False</td><td>Whether the iSCSI boot initiator uses DHCP to obtain the iniator name, IP address, and netmask. Default it will be null value</td></tr>
<tr><td>RouterAdvertisementEnabled</td><td>Boolean</td><td>False</td><td>Whether IPv6 router advertisement is enabled for the iSCSI boot target. Default it will be null value</td></tr>
<tr><td>AuthenticationMethod</td><td>String</td><td>False</td><td>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.
<table><tr><th>Enum</th><th>Description</th></tr><tr><td>None</td><td>No iSCSI authentication is used.</td></tr><tr><td>CHAP</td><td>iSCSI Challenge Handshake Authentication Protocol (CHAP) authentication is used.</td></tr><tr><td>MutualCHAP</td><td>iSCSI Mutual Challenge Handshake Authentication Protocol (CHAP) authentication is used.</td></tr></table></td></tr>
<tr><td>CHAPUsername</td><td>String</td><td>False</td><td>The username for CHAP authentication. Default it will be null value</td></tr>
<tr><td>CHAPSecret</td><td>String</td><td>False</td><td>The shared secret for CHAP authentication. Default it will be null value</td></tr>
<tr><td>MutualCHAPUsername</td><td>String</td><td>False</td><td>The CHAP Username for 2-way CHAP authentication. Default it will be null value</td></tr>
<tr><td>MutualCHAPSecret</td><td>String</td><td>False</td><td>The CHAP Secret for 2-way CHAP authentication. Default it will be null value</td></tr>
</table>

Table 75 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.
PermanentWWNN	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.
FibreChannelId	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: ConfiguredLocally — The set of FC/FCoE boot targets was applied locally through API or UI. Enum: ProvidedByFabric — The set of FC/FCoE boot targets was applied by the Fibre Channel fabric.
FCoELocalVLANId	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’’
AllowFIPVLANDiscovery	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.

<table>
<tr><td></td><td></td><td></td><td>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”</td></tr>
<tr><td rowspan="5">BootTargets</td><td rowspan="5">Array</td><td rowspan="5">False</td><td>An array of Fibre Channel boot targets configured for this network device function.</td></tr>
<tr><td>
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>WWPN</td><td>String</td><td>False</td><td>The World-Wide Port Name to boot from.</td></tr>
<tr><td>LUNID</td><td>String</td><td>False</td><td>The Logical Unit Number (LUN) ID to boot from on the device referred to by The corresponding WWPN.</td></tr>
<tr><td>BootPriority</td><td>Number</td><td>False</td><td>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.</td></tr>
</table>
</td></tr>
</table>

Table 76 InfiniBand Properties

Name	Type	Read Only	Description
MTUSize	Number	True	The maximum transmission unit (MTU) configured for this network device function.
NodeGUID	String	True	This is the currently configured node GUID of the network device function.
PermanentNodeGUID	String	True	The permanent node GUID assigned to this network device function.
PermanentPortGUID	String	True	The permanent port GUID assigned to this network device function.
PermanentSystemGUID	String	True	The permanent system GUID assigned to this network device function.
PortGUID	String	True	The currently configured port GUID of the network device function.
SystemGUID	String	True	This is the currently configured system GUID of the network device function.
SupportedMTUSizes	Array of numbers	True	The maximum transmission unit (MTU) sizes supported for this network device function.

3.7.15 NetworkDeviceFunction Future State (SD)

A Network Device Function represents a logical interface exposed by the network adapter.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/NetworkDeviceFunctions/{{NetworkDeviceFunctions_instance}}/SD

Content-Type: application/json

Response

The response of the request will be in JSON format. The properties are mentioned inTable NetworkDeviceFunction.

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

PATCH

Request

PATCH

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/NetworkAdapters/{{NetworkAdapter_instance}}/NetworkDeviceFunctions/{{NetworkDeviceFunctions_instance}}/SD

Content-Type: application/json

Request Body
Please refer to the properties that are patchable in Table NetworkDeviceFunction for which ReadOnly is false that can be sent as Request body in json format.

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Example Request Body:

NOTE
Below is just a example of request body, please change the property value with the actual iSCSI details.

```
{
    "iSCSIBoot" :{
      "IPAddressType" : "IPv4",
      "InitiatorIPAddress" : "10.110.116.251",
      "InitiatorName" : "iqn.1991-10.com.ami:RFInitiator",
      "InitiatorDefaultGateway" : "10.110.116.2",
      "InitiatorNetmask" : "255.255.0.0",
      "TargetInfoViaDHCP" : false,
      "PrimaryTargetName" : "iqn.1991-10.com.ami:itx00304861d09ace05:iscsiboot2",
      "PrimaryTargetIPAddress" : "10.110.116.2",
      "PrimaryTargetTCPPort" : 3260,
      "PrimaryLUN" : 0,
      "PrimaryVLANEnable" : false,
      "PrimaryVLANId" : 0,
```

```
        "PrimaryDNS" : "0.0.0.0" ,
        "IPMaskDNSViaDHCP" : false,
        "RouterAdvertisementEnabled" : false,
        "AuthenticationMethod" : "None"
    }
}
```

Response

The response status is success with status code as 204. For Error Responses refer "Redfish Error Response" and "Status Codes".

3.7.16 NetworkDeviceFunction VLAN Interface Collection

This represents the collection of NetworkDeviceFunction VLAN Network Interface resources available in Chassis.
For the detailed information, please refer VLAN Network Interface Collection section in Systems API chapter.

3.7.17 NetworkDeviceFunction VLAN Interface

This resource represents the NetworkDeviceFunction 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.
For the detailed information, please refer VLAN Network Interface section in Systems API chapter.

3.7.18 NetworkDeviceFunction VLAN Interface Future State (SD)

This resource represents the NetworkDeviceFunction VLAN Network Interface for the resource or service to which it is associated.
For the detailed information, please refer VLAN Network Interface Future State section in Systems API chapter.

3.7.19 NetworkAdapter Collection

It displays the collection of network adapter resource instances available in the system.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/NetworkAdapters
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.7.20 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.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 77 NetworkAdapter Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
Status	Object	True	Refer Section Resource 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	True	The set of network controllers ASICs that make up this NetworkAdapter.
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.
NetworkDevice Functions (N)	Object	True	Contains a reference to the members of NetworkDeviceFunctionCollection.
Processors	Object	True	The link to the collection of offload processors contained in this network adapter.

			Please refer section 3.6.9 ProcessorCollection
Assembly	Object	True	The link to the assembly Resource associated with this adapter. **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.*
Ports (N)	Object	True	Contains a reference to the members of PortCollection.

Table 78 Controller Properties

Name	Type	Read Only	Description
FirmwarePackage Version	String	True	Resource Identifier
Location	Object	True	Refer for Table Resource schema properties Resource.Location.
PCIeInterface	Object	True	The PCIe interface details for this controller. Refer Table PCIeInterface 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	Object	True	Links for this controller.

Name	Type	Read Only	Description
PCIeDevices @odata.count	Number	True	An integer representing the number of items in a collection. **NOTE** *Require PCIe support, only north bound available.*
PCIeDevices	Array	True	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 Resource. **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
			Ports	Array	True	An array of links to the Ports associated with this Network Controller.
			Ports@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	True	An array of references to the NetworkDeviceFunctions.
ControllerCapabilities	Object	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	True	This object shall contain capability, status, and configuration values related to Data Center Bridging (DCB) for this controller.
			VirtualizationOffload	Object	True	This object shall contain capability, status, and configuration values related to virtualization offload for this controller.
			NPAR	Object	True	NIC Partitioning (NPAR) capabilities for this controller.
			NPIV	Object	True	N_Port ID Virtualization (NPIV) capabilties for this controller.

Table 79 DataCenterBridging Properties

Name	Type	Read Only	Description
Capable	Boolean	True	Whether this controller is capable of Data Center Bridging (DCB).

Table 80 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
			SRIOVVEPACapable	Boolean	True	Whether this controller supports Single Root Input/Output Virtualization (SR-IOV) in Virtual Ethernet Port Aggregator (VEPA) mode

Table 81 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 82 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.

3.7.21 NetworkAdapter ProcessorCollection

It displays a list of Processor instances available in the Chassis.
For the detailed information, please refer ProcessorCollection section in Systems API chapter.

3.7.22 NetworkAdapter Processor

This is the schema definition for the Processor resource. It represents the properties of a processor attached to a System.
For the detailed information, please refer Processor section in Systems API chapter.

3.7.23 PCIeDevice Collection

It displays the collection of PCIeDevice resource instances available in the Chassis.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/PCIeDevices
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.7.24 PCIeDevice

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

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/PCIeDevices/{{PCIeDevices_instance}}
Content-Type: application/json
```

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 83 PCIeDevice Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Section Resource. **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 Resource
Status	Object	True	Refer Section Resource 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	True	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 Table Resource Complex Types under Section Resource. **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.

PCIeFunctions	Object	True	An reference to PCIeFunctionsCollection exposed by this device.
PCIeInterface	Object	True	This is the definition for a PCI Interface object. Refer Table PCIeInterface Properties
Assembly	Object	True	A reference to the Assembly resource associated with this PCIe device. **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.*

Table 84 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.
MaxPCIeType	String	True	The highest version of the PCIe specification supported by this device. Refer Table PCIeDevice Properties
PCIeType	String	True	The version of the PCIe specification in use by this device. Refer Table PCIe Types Properties
Oem	Object		Refer Resource Complex Types under Section Resource. **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 85 PCIe Types 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.

3.7.25 PCIeFunction Collection

It displays the collection of PCIeFunctions resource instances available under the PCIeDevice.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/PCIeDevices/{{PCIeDeviceInstance}}/PCIeFunctions

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.7.26 PCIeFunction

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

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/PCIeDevices/{{PCIeDevices_instance}}/PCIeFunctions/{{PCIeFunctions_instance}}

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 86 PCIeFunction Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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

<table>
<tr><td>Description</td><td>String</td><td>True</td><td>Provides description of the resource. Refer Section Resource</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Oem. PCIeFunction will take the State & Health values as per the parent PCIeDevice.</td></tr>
<tr><td>FunctionId</td><td>Number</td><td>True</td><td>The the PCIe Function identifier.</td></tr>
<tr><td>FunctionType</td><td>String</td><td>True</td><td>The value of this property shall be the function type of the PCIe device function such as Physical or Virtual.</td></tr>
<tr><td>DeviceClass</td><td>String</td><td>True</td><td>The value of this property shall be the device class of the PCIe device function such as Storage, Network, Memory etc.</td></tr>
<tr><td>DeviceId</td><td>String</td><td>True</td><td>The Device ID of this PCIe function.</td></tr>
<tr><td>VendorId</td><td>String</td><td>True</td><td>The Vendor ID of this PCIe function.</td></tr>
<tr><td>ClassCode</td><td>String</td><td>True</td><td>The Class Code of this PCIe function.</td></tr>
<tr><td>RevisionId</td><td>String</td><td>True</td><td>The Revision ID of this PCIe function.</td></tr>
<tr><td>SubsystemId</td><td>String</td><td>True</td><td>The Subsystem ID of this PCIe function.</td></tr>
<tr><td>SubsystemVendorId</td><td>String</td><td>True</td><td>The Subsystem Vendor ID of this PCIe function.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>AmiBios.ChangeState is the only action under Oem. The Actions object contains the available custom actions on this resource like OemActions if any.
NOTE
This Action will be performed through HHM Module of BIOS which requires KCS interface between BMC and BIOS. In SPX-13 AST2600EVB setup KCS interface is not available and this action is not validated. Once CRB available for AST2600 this action can be validated.</td></tr>
<tr><td>Links</td><td>Object</td><td></td><td>The links object contains the links to other resources that are related to this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Oem</td><td>Object</td><td>True</td><td>Refer Table Resource Complex Types under Section Resource.
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.</td></tr>
<tr><td>Drives</td><td>Array</td><td>True</td><td>An array of references to the drives which the PCIe device produces.
NOTE
PCIeDevices can either represent a Drive or a Network Card; if it represents a Drive, then Drive related Links will be populated and if it represents a Network Card,</td></tr>
</table></td></tr>
</table>

						then Network related Links will be populated.
			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. **NOTE** *PCIeDevices can either represent a Drive or a Network Card; if it represents a Drive, then Drive related Links will be populated and if it represents a Network Card, then Network related Links will be populated.*
			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. **NOTE** *PCIeDevices can either represent a Drive or a Network Card; if it represents a Drive, then Drive related Links will be populated and if it represents a Network Card, then Network related Links will be populated.*
			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.
			NetworkDeviceFunctio	Number	True	An integer representing the number of items in a collection.

			ns@odata.count			
			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.

3.7.27 PCIeSlots

PCIeSlots contains set of PCIe slot information.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/PCIeSlots
Content-Type: application/json
```

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 87 PCIeSlots Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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	Descriptin of the Resource
HotPluggable	boolean	True	Indicates whether the PCIe slot supports hotplug.
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.
Slots	Array		The PCI Slots information. Refer Table Slots Properties

Table 88 Slots Properties

Name	Type	Read Only	Description
Lanes	Number	True	Maximum number of PCIe lanes supported by the slot.
Links	Object	True	Refer Table Slots Properties
HotPluggable	boolean	True	Indicates whether the PCIe slot supports hotplug.
Location	Object	True	Refer for Table Resource 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	True	Refer Table Resource Complex Types under Section Resource. **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.*
PCIeTypes	String	True	PCIe Specification supported by this slot.
SlotType	String	True	PCIe Slot type for this slot. Enum: Description FullLength: Full-Length PCIe slot. HalfLength: Half-Length PCIe slot. LowProfile: Low-Profile or Slim PCIe slot. Mini: PCIe M.2 slot. M2: Mini PCIe slot. OEM: An OEM-specific slot.
Status	Object	True	Refer Section Resource for Resource.Oem.

Table 89 Links Properties

Name	Type	Read Only	Description
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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.*
PCIeDevice	Array	True	PCIe Devices connected in this slot.
PCIeDevice@odata.count	Number	True	The number of items in PCIeDevices.

3.7.28 Sensor Collection

This resource shall represent a resource collection of Sensor instances for a Redfish implementation.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Sensors
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

NOTE
In the Sensor Collection URI, two discrete sensors "VR Watchdog" and "FP NMI Diag Int" will not be listed because we are listing only those Sensors which have 0 as the value of the bit " Settable Sensor" (MSB of Sensor Initialization) and the above mentioned two Sensors have 128 as the value of the "Settable Sensor" bit. However, these sensors will be llisted in the BMC Web UI as well as the IPMI Sensor List Command.

3.7.29 Sensor

This Resource represents a Sensor for a Redfish implementation.

GET

Request

```
https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Sensors/{{sensor_instance}}
Content-Type: application/json
```

Response

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

Table 90 Sensor Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Description of the Resource
Accuracy	Number	True	The estimated percent error of measured versus actual values.

AdjustedMaxAllowableOperatingValue	Number, Null	True	The adjusted maximum allowable operating value for this equipment based on the environmental conditions.
AdjustedMinAllowableOperatingValue	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.
Line1ToNeutralAndL1L2	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.
Line2ToNeutralAndL1L2	The circuits formed by L1, L2, and Neutral current-carrying conductors when PhaseWiringType.TwoPhase4Wire or ThreePhase5Wire.
Line2ToNeutralAndL2L3	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 currencarrying conductors when

				PhaseWiringType.ThreePhase4Wire or ThreePhase5Wire.
			Line3ToNeutral	The circuit formed by L3 and Neutral current carrying conductors when PhaseWiringType.ThreePhase5Wire.
			Line3ToNeutralAndL3 L1	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	True	The location information for this sensor. For property details, see location Table Resource schema properties.	
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.
PhysicalSubContext	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.	

<table>
<tr><td>Precision</td><td>Number, Null</td><td>True</td><td>The number of significant digits in the reading.</td></tr>
<tr><td>ReactiveVAR</td><td>Number, Null</td><td>True</td><td>The square root of the difference term of squared ApparentVA and squared Power (Reading) for a circuit, in VAR units.</td></tr>
<tr><td>Reading</td><td>Number, Null</td><td>True</td><td>The sensor value.</td></tr>
<tr><td>ReadingRangeMax</td><td>Number, Null</td><td>True</td><td>The maximum possible value for this sensor.</td></tr>
<tr><td>ReadingRangeMin</td><td>Number, Null</td><td>True</td><td>The minimum possible value for this sensor.</td></tr>
<tr><td>ReadingType</td><td>String, Null</td><td>True</td><td>The type of sensor.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>AirFlow</td><td>Airflow.</td></tr>
<tr><td>Altitude</td><td>Altitude.</td></tr>
<tr><td>Barometric</td><td>Barometric pressure.</td></tr>
<tr><td>Current</td><td>Current.</td></tr>
<tr><td>EnergyJoules</td><td>Energy (Joules).</td></tr>
<tr><td>EnergykWh</td><td>Energy (kWh).</td></tr>
<tr><td>Frequency</td><td>Frequency.</td></tr>
<tr><td>Humidity</td><td>Relative Humidity.</td></tr>
<tr><td>LiquidFlow</td><td>Liquid flow.</td></tr>
<tr><td>LiquidLevel</td><td>Liquid level.</td></tr>
<tr><td>Power</td><td>Power.</td></tr>
<tr><td>Pressure</td><td>Pressure.</td></tr>
<tr><td>Rotational</td><td>Rotational.</td></tr>
<tr><td>Temperature</td><td>Temperature.</td></tr>
<tr><td>Voltage</td><td>Voltage (AC or DC).</td></tr>
</table></td></tr>
<tr><td>ReadingUnits</td><td>String, Null</td><td>True</td><td>The units of the reading and thresholds.</td></tr>
<tr><td>SensingFrequency</td><td>Number, Null</td><td>True</td><td>The time interval between readings of the physical sensor.</td></tr>
<tr><td>SensorResetTime</td><td>String, Null</td><td>True</td><td>The date and time when the time-based properties were last reset.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>The status and health of the Resource and its subordinate or dependent Resources.
For property details, see Status in Refer Table Resource Complex Types.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>The Actions object contains the available custom actions on this resource like OemActions if any.</td></tr>
<tr><td>Thresholds</td><td>Object</td><td></td><td>The set of thresholds defined for this sensor.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>LowerCaution</td><td>Object</td><td>True</td><td>The value at which the reading is below normal range. Please refer the below Table Threshold Properties table for the sub attributes under this attribute.</td></tr>
</table></td></tr>
</table>

			LowerCritical	Object	True	The value at which the reading is below normal range but not yet fatal. Please refer the below Table Threshold Properties table for the sub attributes under this attribute.
			LowerFatal	Object	True	The value at which the reading is below normal range and fatal. Please refer the below Table Threshold Properties table for the sub attributes under this attribute.
			UpperCaution	Object	True	The value at which the reading is above normal range. Please refer the below Table Threshold Properties table for the sub attributes under this attribute.
			UpperCritical	Object	True	The value at which the reading is above normal range but not yet fatal. Please refer the below Table Threshold Properties table for the sub attributes under this attribute.
			UpperFatal	Object	True	The value at which the reading is above normal range and fatal. Please refer the below Table 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 durrent.

Table 91 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.	

3.7.30 Assembly

GET

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}}/PCIeDevices/{{PCIeDevice_instance}}/Assembly

Content-Type: application/json

Response

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

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 92 Assembly Properties

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

			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 Assembly Properties
Assemblies@odata.count	Number	True	The count of Assemblies.
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.

Table 93 Assemblies Properties

Name	Type	Read Only	Description
@odata.id(M)	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource 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.

3.7.31 Ports Collection

It displays the collection of Port resource instances available in the system.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}/Ports

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/GraphicsControllers/{{graphicscontroller_instance}}/Ports

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/USBControllers/{{usbcontroller_instance}}/Ports

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.7.32 Ports Instance

A Port represents a discrete physical port capable of connecting to a network.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/NetworkAdapters/{{NetwrokAdapter_instance}}/Ports/{{Port_instance}}

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/GraphicsControllers/{{graphicscontroller_instance}}/Ports/{{port_instance}}

https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/USBControllers/{{usbcontroller_instance}}/Ports/{{port_instance}}

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

NOTE
Please refer "Section Redfish Inventory" Support in this document for the properties that would be populated via HostInterface from BIOS.

Table 94 Ports Instance Properties

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

<table>
<tr><td></td><td></td><td></td><td colspan="4">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.</td></tr>
<tr><td>Id(M)</td><td>String</td><td>True</td><td colspan="4">True Resource Identifier</td></tr>
<tr><td>Name(M)</td><td>String</td><td>True</td><td colspan="4">Name of the Resource</td></tr>
<tr><td>Description</td><td>String</td><td>True</td><td colspan="4">Provides description of the resource. Refer Section Resource</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td colspan="4">Refer Section Resource for Resource.Oem.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td colspan="4">The Actions object contains the available custom actions on this resource like OemActions if any.</td></tr>
<tr><td>ActiveWidth</td><td>Number</td><td>True</td><td colspan="4">The number of active lanes for this interface.</td></tr>
<tr><td>CurrentSpeedGbps</td><td>Number</td><td>True</td><td colspan="4">The current speed of this port.</td></tr>
<tr><td>InterfaceEnabled</td><td>Boolean</td><td>True</td><td colspan="4">An indication of whether the interface is enabled.</td></tr>
<tr><td>LinkTransitionIndicator</td><td>Boolean</td><td>True</td><td colspan="4">The number of link state transitions for this interface.</td></tr>
<tr><td>LocationIndicatorActive</td><td>Boolean</td><td>True</td><td colspan="4">An indicator allowing an operator to physically locate this resource.</td></tr>
<tr><td>Location</td><td>Object</td><td>True</td><td colspan="4">The location of the port.</td></tr>
<tr><td>MaxFrameSize</td><td>Number</td><td>True</td><td colspan="4">The maximum frame size supported by the port.</td></tr>
<tr><td>MaxSpeedGbps</td><td>Number</td><td>True</td><td colspan="4">The maximum speed of this port as currently configured.</td></tr>
<tr><td>PortId</td><td>string</td><td>True</td><td colspan="4">The label of this port on the physical package for this port.</td></tr>
<tr><td>SignalDetected</td><td>Boolean</td><td>True</td><td colspan="4">An indication of whether a signal is detected on this interface.</td></tr>
<tr><td rowspan="9">Ethernet</td><td rowspan="9">Object</td><td rowspan="9">True</td><td>Name</td><td>Type</td><td>Read Only</td><td colspan="2">Description</td></tr>
<tr><td>FlowControlConfiguration</td><td>string</td><td>True</td><td colspan="2">The locally configured 802.3x flow control setting for this port.</td></tr>
<tr><td rowspan="8">FlowFlowControlStatusControlStatus</td><td rowspan="8">string</td><td rowspan="8">True</td><td colspan="2">The 802.3x flow control behavior negotiated with the link partner for this port.</td></tr>
<tr><td>Enum</td><td>Description</td></tr>
<tr><td>None</td><td>No IEEE 802.3x flow control is enabled on this port.</td></tr>
<tr><td>TX</td><td>IEEE 802.3x flow control may be initiated by this station.</td></tr>
<tr><td>RX</td><td>IEEE 802.3x flow control may be initiated by the link partner.</td></tr>
<tr><td>TX_RX</td><td>IEEE 802.3x flow control may be initiated by this</td></tr>
</table>

<table>
<tr><td rowspan="11"></td><td rowspan="11"></td><td rowspan="11"></td><td></td><td></td><td></td><td></td><td>station or the link partner.</td></tr>
<tr><td>LLDPEnabled</td><td>Boolean</td><td>True</td><td colspan="2">Enable/disable LLDP for this port.</td></tr>
<tr><td>WakeOnLANEnabled</td><td>Boolean</td><td>True</td><td colspan="2">Indicates whether Wake on LAN (WoL) is enabled on this port.</td></tr>
<tr><td>EEEEnabled</td><td>Boolean</td><td>True</td><td colspan="2">Indicates whether IEEE 802.3az Energy-Efficient Ethernet (EEE) is enabled on this port.</td></tr>
<tr><td>AssociatedMACAddresses</td><td>Array of strings</td><td>True</td><td colspan="2">An array of configured MAC addresses that are associated with this network port, including the programmed address of the lowest numbered network device function, the configured but not active address, if applicable, the address for hardware port teaming, or other network addresses.</td></tr>
<tr><td>LLDPReceive</td><td>Object</td><td>True</td><td colspan="2">LLDP data being received on this link.
Please Refer Table LLDPTransmit/LLDPReceive Properties table</td></tr>
<tr><td>LLDPTransmit</td><td>Object</td><td>True</td><td colspan="2">LLDP data being transmitted on this link.
Please Refer Table LLDPTransmit/LLDPReceive Properties table</td></tr>
<tr><td rowspan="4">SupportedEthernetCapabilities</td><td rowspan="4">Array of strings</td><td rowspan="4">True</td><td colspan="2">The set of Ethernet capabilities that this port supports.</td></tr>
<tr><td>Enum</td><td>Description</td></tr>
<tr><td>EEE</td><td>IEEE 802.3az Energy-Efficient Ethernet (EEE) is supported on this port.</td></tr>
<tr><td>WakeOnLAN</td><td>Wake on LAN (WoL) is supported on this port.</td></tr>
<tr><td rowspan="2">FibreChannel</td><td rowspan="2">Object</td><td rowspan="2">True</td><td>Name</td><td>Type</td><td>Read Only</td><td colspan="2">Description</td></tr>
<tr><td>PortConnectionType</td><td>string</td><td>True</td><td colspan="2">The connection type of this port.</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>NumberDiscoveredRemotePorts</td><td>Number</td><td>True</td><td colspan="4">The number of ports not on the associated device that the associated device has discovered through this port.</td></tr>
<tr><td></td><td></td><td></td><td>FabricName</td><td>string</td><td>True</td><td colspan="4">The Fibre Channel Fabric Name provided by the switch.</td></tr>
<tr><td rowspan="6">LinkConfiguration</td><td rowspan="6">Object</td><td rowspan="6">True</td><td>Name</td><td>Type</td><td>Read Only</td><td colspan="4">Description</td></tr>
<tr><td>AutoSpeedNegotiationCapable</td><td>Boolean</td><td>true</td><td colspan="4">Controls whether this port is configured to enable autonegotiating speed.</td></tr>
<tr><td>AutoSpeedNegotiationEnabled</td><td>Number</td><td>true</td><td colspan="4">The set of link speed capabilities of this port.</td></tr>
<tr><td rowspan="3">ConfiguredNetworkLinks</td><td rowspan="3">array of objects</td><td rowspan="3">true</td><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>ConfiguredWidth</td><td>string</td><td>true</td><td>The link width this port is configured to use for auto negotiation in conjunction wih the link speed.</td></tr>
<tr><td>ConfiguredLinkSpeedGbpsNumbe</td><td>True</td><td>The link speed per lane this port is configured to use for auto negotiation.</td><td>ConfiguredLinkSpeedGbps Number</td></tr>
<tr><td>LinkNetworkTechnology</td><td>string</td><td>true</td><td colspan="7">The link network technology capabilities of this port.</td></tr>
<tr><td>PortMedium</td><td>string</td><td>true</td><td colspan="7">The physical connection medium for this port.</td></tr>
<tr><td>PortProtocol</td><td>string</td><td>true</td><td colspan="7">The protocol being sent over this port.</td></tr>
<tr><td>PortType</td><td>string</td><td>true</td><td colspan="7">The type of this port.</td></tr>
<tr><td>LinkState</td><td>string</td><td>true</td><td colspan="7">The desired link state for this interface.</td></tr>
</table>

<table>
<tr><td>LinkStatus</td><td>string</td><td>true</td><td colspan="4">The desired link status for this interface.</td></tr>
<tr><td rowspan="10">Links</td><td rowspan="10">Object</td><td rowspan="10">true</td><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>ConnectedSwitches</td><td>array of links</td><td>true</td><td>An array of links to the switches that connect to the device through this port.</td></tr>
<tr><td>ConnectedSwitches@odata.count</td><td>number</td><td>true</td><td>Number of links</td></tr>
<tr><td>ConnectedPorts</td><td>array of links</td><td>true</td><td>An array of links to the remote ports connected to this port.</td></tr>
<tr><td>ConnectedPorts@odata.count</td><td>number</td><td>true</td><td>Number of links</td></tr>
<tr><td>AssociatedEndpoints</td><td>array of links</td><td>true</td><td>An array of links to the endpoints that connect through this port.</td></tr>
<tr><td>AssociatedEndpoints@odata.count</td><td>number</td><td>true</td><td>Number of links</td></tr>
<tr><td>ConnectedSwitchPorts</td><td>array of links</td><td>true</td><td>An array of links to the ports that connect to the switch through this port.</td></tr>
<tr><td>ConnectedSwitchPorts@odata.count</td><td>number</td><td>true</td><td>Number of links</td></tr>
</table>

Table 95 LLDPTransmit/LLDPReceive Properties table

Name	Type	Read Only	Description
ChassisId	String	True	Link Layer Data Protocol (LLDP) chassis ID.
ChassisIdSubtype	String	True	The type of identifier used for the chassis ID. Please Refer Table Error! Reference source not found.
ManagementAddressIPv4	String	True	The IPv4 management address to be transmitted from this endpoint.
ManagementAddressIPv6	String	True	The IPv6 management address to be transmitted from this endpoint.
ManagementAddressMAC	String	True	The management MAC address to be transmitted from this endpoint.
ManagementVlanId	Number	True	The management VLAN ID to be transmitted from this endpoint.
PortId	String	True	A colon delimited string of hexadecimal octets identifying a port to be transmitted from this endpoint.
PortIdSubtype	String	True	The port ID subtype to be transmitted from this endpoint. Please Refer Table Error! Reference source not found.

Table 96 Enum value for IEEE802IdSubtype

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

3.7.33 MediaContorller Collection

It displays the collection of MediaController resource instances available in the system.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/MediaControllers

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.7.34 MediaContorller Instance

This resource contains the media controller in a Redfish implementation.

GET

Request

https://{{ip}}/redfish/v1/Chassis/{{system_instance}}/MediaControllers/{{MediaControllers_instance}}

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

NOTE
Please refer Section "Redfish Inventory Support" in this document for the properties that would be populated via HostInterface from BIOS.

Table 97 MediaController Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
Status	Object	True	Refer Section Resource for Resource.Oem.
Actions	Object	True	The Actions object contains the available custom actions on this resource like OemActions if any.
SerialNumber	String	True	The serial number of this media controller.
MediaControllerType	String	True	The type of media controller.
UUID	String	True	The UUID for this media controller.
Model	String	True	The model of this media controller.
PartNumber	String	True	The part number of this media controller.
Manufacturer	String	True	The manufacturer of this media controller.

3.8 Managers API

3.8.1 Manager Collection

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

GET

Request

```
https://{{ip}}/redfish/v1/Managers
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.8.2 Manager

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

GET

Request

```
https://{{ip}}/redfish/v1/Managers/{{manager_instance}}
Content-Type: application/json
```

Response

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

Table 98 Manager Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
ManagerType	String	True	An enumeration property that represents the type of

<table>
<tr><td></td><td></td><td></td><td>manager that this resource represents.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>BMC</td><td>A controller which provides management functions for a single computer system.</td></tr>
</table></td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td>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>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>ManagerForServers(N)</td><td>Array</td><td>True</td><td>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 extensions” document</td></tr>
<tr><td>ManagerForServers@odata.count</td><td>Number</td><td>True</td><td>An integer representing the number of items in a collection.</td></tr>
<tr><td>ManagerForSwitches(N)</td><td></td><td></td><td>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</td></tr>
</table></td></tr>
</table>

						Platform specific Properties in "How to Add OEM extensions" document
			ManagerForSwitches@odata.count	Number	True	An integer representing the number of items in a collection.
			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 extensions" document*
			ManagerInChassis(N)	Object	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 SoftwareInventory Resource that represent the active firmware image for this manager. **NOTE** *Platform specific porting needed; 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 extensions" document.
			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 SoftwareInventory Resources that represent the firmware images that apply to this manager. **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 extensions" document.*
			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 Resource Type Definitions.			
UUID	String	True	The Universal Unique Identifier (UUID) for this Manager. Refer Table Resource Type Definitions.			
Model	String	True	Model number of this manager as defined by the manufacturer.			
DateTime	String	False	The current DateTime (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* **NOTE** *According to UNIX time maximum date allowed to*			

			PATCH is 2038-01-18 and minimum date allowed to PATCH is 1970-01-02.
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*
FirmwareVersion	String	True	The firmware version of this Manager.
SerialConsole	Object		Information about the Serial Console service provided by this manager. Refer Table SerialConsole Properties.
CommandShell	Object		Information about the Command Shell service provided by this manager. Refer Table 100 CommandShell Properties.
GraphicalConsole	Object		The information about the Graphical Console (KVM-IP) service of this manager. Refer Table 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 Resource 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 Redundancy 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)	Object	True	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.
Certificates	Object	True	A Reference to the collection of the Certificates

Table 99 SerialConsole Properties

Name	Type	Read Only	Description
ServiceEnabled	Boolean	False	Indicates if the service is enabled for this manager. **NOTE** *This property will be true if any one of the protocol is enabled in the ConnectTypesSupported. IPMI-SOL service is not supported in USB interface, this property will be nil in the response when the request is coming thorugh USB interfaces.*
MaxConcurrent Sessions	Number	True	Indicates the maximum number of concurrent service sessions supported by the implementation regardless of protocol..Minimum Value:0. **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.*
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 100 CommandShell Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>ServiceEnabled</td><td>Boolean</td><td>False</td><td>Indicates if the service is enabled for this manager.
NOTE
This property will be true if any one of the protocol is enabled in the ConnectTypesSupported.
If IPMI is present in ConnectTypesSupported then CommandShell cannot be disabled.
If IPMI is not present, then this property will be true if any one of the services in the ConnectTypesSupported is Enabled.
If this property is patched to true, then all the other services in ConnectTypesSupported will be enabled.</td></tr>
<tr><td>MaxConcurrentSessions</td><td>Number</td><td>True</td><td>Indicates the maximum number of concurrent service sessions supported by the implementation regardless of protocol. Minimum Value:0.
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.
NOTE
The number of SSH MaxConcurrentSessions update based the OEM API and also getting the detail. So the default MaxConcurrentSessions of ComandShell based on the IPMI and SSH max concureent session to display.</td></tr>
<tr><td>ConnectTypesSupported</td><td>Array</td><td>True</td><td>The value of ConnectTypesSupported shall be an array of the enumerations provided here.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>SSH</td><td>The controller supports a CommandShell connection using the SSH protocol.
NOTE
There is no limit for SSH sessions and maximum session is not applicable.</td></tr>
<tr><td>Telnet</td><td>The controller supports a CommandShell connection using the Telnet protocol.
NOTE
Telnet support is based on the AMI SPX based Firmware support.</td></tr>
<tr><td>IPMI</td><td>The controller supports a CommandShell connection using the IPMI protocol.</td></tr>
<tr><td>Oem</td><td>The controller supports a CommandShell connection using an OEM-specific protocol.</td></tr>
</table></td></tr>
</table>

Table 101 Graphical Console Properties

Name	Type	Read Only	Description	
ServiceEnabled	Boolean	False	Indicates if the service is enabled for this manager.	
MaxConcurrentSessions	Number	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.

PATCH

Request

```
https://{{ip}}/redfish/v1/Managers/{{manager_instance}}
Content-Type: application/json
```

Request Body

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

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section ‘’Redfish Error Response” and Section ‘’Status Codes”.

POST

Request

```
POSThttps://{{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”
}
```

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 "Redfish Error Response" and Section "Status Codes".

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

3.8.3 Manager Network Protocol

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

GET

Request

```
https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/NetworkProtocol
Content-Type: application/json
```

Response

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

Table 102 Manager Network Protocol Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
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 Protocol Properties below.
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 SNMP Protocol Properties Protocol Properties below. **NOTE** *ProtocolEnabled and Port fields for this cannot be modified because of limitations in the BMC.*
VirtualMedia	Object	False	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 Table Protocol Properties below. **NOTE** *The Port field for this protocol is read only when single port app is enabled.* *VirtualMedia maps to cd-media in AMI BMC.*
Telnet	Object	False	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 Table Protocol Properties below. **NOTE** *Telnet support is based on the AMI SPX based Firmware support. Please check SPX Firmware Release Document for Telnet feature support.*
SSDP	Object	False	This object shall contain information for the SSDP protocol settings 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 SNMP Protocol Properties **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.*
IPMI	Object	False	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 Table Protocol Properties below. **NOTE** *Port fields for this property cannot be modified*

<table>
<tr><td></td><td></td><td></td><td>because of limitations in the BMC. ProtocolEnabled property will be update to true/false based on IPMI-Over-LAN is modified (Enabled/Disabled) through BMCWeb or through IPMI-commands or PATCH call.</td></tr>
<tr><td>SSH</td><td>Object</td><td>False</td><td>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 Protocol Properties.</td></tr>
<tr><td>KVMIP</td><td>Object</td><td>False</td><td>This object shall contain information for the KVM-IP (Keyboard, Video, Mouse) protocol settings for the manager.
Refer Table Protocol Properties below.
NOTE
The Port field for this protocol is read only when single port app is enabled.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Oem.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>This object will contain the actions for this resource under Oem property if any.</td></tr>
<tr><td>NTP</td><td>Object</td><td>False</td><td>This object shall contain information for the NTP protocol settings for the manager.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>ProtocolEnabled</td><td>Boolean</td><td>False</td><td>Indicates if the protocol is enabled or disabled.</td></tr>
<tr><td>Port</td><td>Number</td><td>True</td><td>Indicates the protocol port.
NOTE
Fixed port number 123 for BMC ntpd.</td></tr>
<tr><td>NTPServers</td><td>Array</td><td>False</td><td>Indicates to which NTP servers this manager is subscribed.</td></tr>
</table></td></tr>
</table>

Table 103 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. **NOTE** *Value of the Port can take any value between 1 and 65535.*

Table 104 HTTPS 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. **NOTE** *Value of the Port can take any value between 1 and 65535.*
Certificates	Object	True	The link to a collection of certificates used for HTTPS. Name / Type / Read only / Description @odata.id / String / True / Link to a Resource Collection of type CertificateCollection

Table 105 SNMP Protocol Properties

Name	Type	Read Only	Description
ProtocolEnabled	Boolean	True	Indicates if the protocol is enabled or disabled.
Port	Number	True	Indicates the port assigned for the protocol.
AuthenticationProtocol	String	True	Indicates the Authentication protocol used for SNMP access to manager. Enum / Description Account / Authentication is determined by account settings. CommunityString / SNMP Community string authentication HMAC_MD5 / HMAC_MD5 authentication HMAC_SHA96 / HMAC_SHA96 authentication
EncryptionProtocol	String	True	Indicates the Encryption protocol used for SNMP access to manager. Enum / Description None / No Encryption Account / Encryption is determined by account settings CBC_DES / CBC-DES encryption CFB128_AES128 / CFB128-AES-128 encryption
EngineId	Object	True	RFC3411-defined engine ID Name / Type / Read Only / Description ArchitectureId / String / True / Item 3 of snmpEngineID syntex of RFC3411 **NOTE** If the most significant bit in PrivateEnterpriseId is set to zero, this property will not be present. EnterpriseSpecificM / String / True / Item 2 of snmpEngineID syntex

			ethod			of RFC3411 **NOTE** If the most significant bit in PrivateEnterpriseId is set to one, this property will not be present.
			PrivateEnterpriseId	String	True	RFC3411-defined private enterprise ID.
EnableSNMPv1	Boolean	True	It indicates if access via SNMPv1 is enabled			
EnableSNMPv2c	Boolean	True	It indicates if access via SNMPv2c is enabled			
EnableSNMPv3	Boolean	True	It indicates if access via SNMPv3 is enabled			

Table 106 SSDP Protocol Properties

Name	Type	Read Only	Description
ProtocolEnabled	Boolean	False	Indicates if the protocol is enabled or disabled.
Port	Number	True	Indicates the port assigned for the protocol. **NOTE** *The SSDP service does not support the SEARCHPORT.UPNP.ORG header and does not allow clients to modify the port number (defaule value is 1900).*

PATCH

Request

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

Content-Type: application/json

Request Body

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

Response

The response status is success with status code as 202. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.8.4 Serial Interface Collection

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.

GET

Request

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

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.8.5 Serial Interface

This schema defines an asynchronous serial interface resource. This resource shall be used to represent serial resources as part of the Redfish specification.
The supported SerialInterface instances are IPMI-SOL, ttyS0, ttyS1, ttyS2, ttyS3, ttyS4

GET

Request

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

Content-Type: application/json

Response

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

Table 107 Serial Interface Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
InterfaceEnabled	Boolean	False only For IPMISOL	This indicates whether this interface is enabled. Default it will be null value

BitRate	String	False only for IPMISOL	The receive and transmit rate of data flow, typically in bitsper-second (bps), over the serial connection and can take any one of the following enum values. “enum” : [“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	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 :- “enum” : [“None” , “Even” , “Odd” , “Mark” , “Space”]
SignalType (C)	String	True	The type of signal used for the communication connection- RS232 or RS485. “enum” : [“Rs232” , “Rs485”] **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 in section 2.21.*
ConnectorType(C)	String	True	The type of connector used for this interface. “enum” : [“RJ45”. , “RJ11.” , “DB9 Female”. , “DB9 Male.” , “DB25 Female.” , “DB25 Male.” , “USB”. , “mUSB.” , “uUSB.”] **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 in section 2.21.*
PinOut (C)	String	True	The physical pin configuration needed for a serial connector. “enum” : [“Cisco” , “Cyclades” , “Digi”] **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 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

PATCH

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

Example PATCH Request Body:

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

Reponse

The response status is success with status code as 204 and no body. For Error Responses refer "Redfish Error Response" and Section "Status Codes".

3.8.6 Virtual Media Collection

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''.

GET

Request

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

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

3.8.7 Virtual Media

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.

GET

Request

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

Content-Type: application/json

Response

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

Table 108 Virtual Media Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Specifies the AMI defined OEM properties.

Name	Type	Read Only	Descriptioni
@odata.type	String	True	Refer Section ODATA Properties
RedirectionStatus	String	True	Specifies the redirection status of the image.

<table>
<tr><td></td><td></td><td></td><td>BoostMode</td><td>Boolean</td><td>True</td><td>Specifies the boostmode support status</td></tr>
<tr><td></td><td></td><td></td><td>TransferProtocolType</td><td>String</td><td>True</td><td>Specifies that the CD redirection is initiated using CIFS encryption method, OEM. The value of this property will be SMBE (CIFS encryption)
NOTE
This property will be available only when the CD redirection is initiated using OEM.</td></tr>
<tr><td>Id(M)</td><td>String</td><td>True</td><td colspan="4">Resource Identifier</td></tr>
<tr><td>Name(M)</td><td>String</td><td>True</td><td colspan="4">Name of the Resource</td></tr>
<tr><td>Description</td><td>String</td><td>True</td><td colspan="4">Provides description of the resource. Refer Section Resource</td></tr>
<tr><td>ImageName</td><td>String</td><td>True</td><td colspan="4">The current image name.</td></tr>
<tr><td>Image</td><td>String</td><td>True</td><td colspan="4">A URI providing the location of the selected image.</td></tr>
<tr><td>ConnectedVia</td><td>String</td><td>True</td><td colspan="4">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><tr><th>Enum</th><th>Description</th></tr><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></table></td></tr>
<tr><td>Inserted</td><td>Boolean</td><td>True</td><td colspan="4">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.</td></tr>
<tr><td>WriteProtected</td><td>Boolean</td><td>True</td><td colspan="4">Indicates the media is write protected.
NOTE
For CD instance, the WriteProtected value is always true.</td></tr>
</table>

<table>
<tr><td rowspan="6">Actions</td><td rowspan="6">Object</td><td rowspan="6">True</td><td colspan="4">EjectMedia - This action is used to detach remote media from virtual media.
InsertMedia - This action is used to attach remote media to virtual media.
This action object will also contain the actions for this resource under Oem property if any.</td></tr>
<tr><td>ActionName</td><td>Property</td><td>Type</td><td>Description</td></tr>
<tr><td rowspan="5">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>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>Transfer Method</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>Transfer Protocol Type</td><td>string</td><td>Network protocol to use with the image.
NOTE
The allowed values for this property is “NFS”, “HTTPS”, “CIFS” and “OEM”.</td></tr>
<tr><td>WriteProtected</td><td>string</td><td>Indicates if the remote media is supposed to be treated as write protected.
NOTE
For CD instance,</td></tr>
</table>

<table>
<tr><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="3"></td><td></td><td></td><td>WriteProtected value is always true.</td></tr>
<tr><td>UserName</td><td>string</td><td>The user name to access the Image parameterspecified URI.
NOTE
This is a required property for “CIFS”, “OEM” and “HTTPS” protocol.</td></tr>
<tr><td>Password</td><td>string</td><td>The password to access the Image parameterspecified URI.
NOTE
This is a required property for “CIFS”, “OEM” and “HTTPS” protocol.</td></tr>
<tr><td>EjectMedia</td><td>-</td><td>-</td><td>Empty parameter should be given as request data.</td></tr>
<tr><td>MediaType</td><td>Array</td><td>True</td><td colspan="3">The values of this array shall be the supported media types for this connection.
NOTE
Only CD MediaType is supported in Redfish
<table><tr><th>Enum</th><th>Description</th></tr><tr><td>CD</td><td>A CD-ROM format (ISO) image.</td></tr></table></td></tr>
<tr><td>TransferProtocolType</td><td>String</td><td>True</td><td colspan="3">Network protocol to use with the image.
<table><tr><th>Enum</th><th>Description</th></tr><tr><td>NFS</td><td>Network File System protocol.</td></tr><tr><td>CIFS</td><td>Common Internet File System.</td></tr><tr><td>HTTPS</td><td>Hypertext Transfer Protocol Secure (HTTPS).</td></tr><tr><td>OEM</td><td>OEM (CIFS Encryption SMBE) support is available only in SPX-13 stack for now</td></tr></table></td></tr>
<tr><td>TransferMethod</td><td>String</td><td>True</td><td colspan="3">Transfer method to use with the given Image.
NOTE
Only Stream TransferMethod is supported in</td></tr>
</table>

			Redfish. Enum: Stream — Description: Stream image file data from the source URI
UserName	String	True	The user name to access the Image parameter-specified URI.

Sample GET response:

```
{
  "@odata.context" : "/redfish/v1/$metadata#VirtualMedia.VirtualMedia" ,
  "@odata.etag" : "\"1593620509\"" ,
  "@odata.id" : "/redfish/v1/Managers/Self/VirtualMedia/CD1" ,
  "@odata.type" : "#VirtualMedia.v1_3_2.VirtualMedia" ,
  "Actions" : {
    "#VirtualMedia.EjectMedia" : {
      "@Redfish.ActionInfo" :"/redfish/v1/Managers/Self/VirtualMedia/CD1/EjectMediaActionInfo
      " ,
      "target" : "/redfish/v1/Managers/Self/VirtualMedia/CD1/Actions/VirtualMedia.EjectMedia"
    },
    "#VirtualMedia.InsertMedia" : {
      "@Redfish.ActionInfo" :"/redfish/v1/Managers/Self/VirtualMedia/CD1/InsertMediaActionInfo"
,
      "target" : "/redfish/v1/Managers/Self/VirtualMedia/CD1/Actions/VirtualMedia.InsertMedia"
    }
  },
  "ConnectedVia" : "NotConnected" ,
  "Description" : "Virtual Media Instance redirected to host via this Manager" ,
  "Id" : "CD1" ,
  "Image" : "//10.0.121.123/home/tamil/image" ,
  "ImageName" : "" ,
  "Inserted" : false,
  "MediaTypes" : [
    "CD"
  ],
  "Name" : "CD1" ,
  "Oem" : {
    "Ami" : {
      "@odata.type" : "#AMIVirtualMedia.v1_0_0.AMIVirtualMedia" ,
      "BoostMode" : false,
      "RedirectionStatus" : "None"
    }
  },
  "TransferMethod" : "Stream" ,
  "TransferProtocolType" : "NFS" ,
  "UserName" : "" ,
  "WriteProtected" : true
}
```

POST [Initiating CD Media Image Redirection]

- Make sure RMedia configuration is enabled in BMC. If not, enable RMedia using EnableRMedia OEM action.
- For now, only one image redirection can be done using HTTPS protocol, hence after redirecting the image using HTTPS, only one instance say CD1 will be displayed under virtual media collection. Multiple Image Redirection support will be given for HTTPS method in future.

Request

```
POST
{{http_protocol}}://{{ip}}/redfish/v1/Managers/{{system_instance}}/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>"
}
```

Sample POST request using HTTPS Method:

```
{
  " Image" : "https://<https_server_ip>/CD_SPEED_ISO.iso" ,
   "TransferProtocolType" : "HTTPS" ,
   "UserName" : "<sys_username>" ,
   "Password" : "<sys_password>"
}
{
   "Image" : "//<https_server_ip>/CD_SPEED_ISO.iso" ,
   "TransferProtocolType" : "HTTPS" ,
   "UserName" : "<sys_username>" ,
   "Password" : "<sys_password>"
}
```

Sample POST request using OEM (CIFS Encryption - SMBE) Method:

```
{
   "Image" : "//<https_server_ip>/CD_SPEED_ISO.iso" ,
   "TransferProtocolType" : "OEM" ,
   "UserName" : "kvm" ,
   "Password" : "ubuntu"
}
```

Response

For success, the response status is 202 with message body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

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

PATCH BoostMode support for InsertMedia Action

Currently in BMC, CD image redirection using BoostMode support is allowed only for single CD instance.

Hence if user wants to do InsertMedia action using BoostMode support for a CD instance, then user can patch BoostMode OEM property value as true for that particular instance.

Boostmode support is available only for CIFS and NFS TransferProtocolType. The value of BoostMode will be changed as false, if the image redirection is initiated with any other TransferProtocolType.

Request

```
PATCH https ://{{ip}}/redfish/v1/Managers/{{system_instance}}/VirtualMedia/CD1
Content-Type: application/json
```

Example Request Body for Editing AccountService:

```
{
   ''Oem'' : {
      ''Ami'' : {
         ''BoostMode'' : true
      }
   }
}
```

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section ''Redfish Error Response'' and Section ''Status Codes''.

Sample Value of RedirectionStatus when initiated through BoostMode :

```
GET
{{http_protocol}}://{{ip}}/redfish/v1/Managers/{{system_instance}}/VirtualMedia/{{CD_instance}}
Content-Type: application/json
```

```
''Oem'' : {
      'Ami'' : {
         ''@odata.type'' : ''#AMIVirtualMedia.v1_0_0.AMIVirtualMedia'' ,
         ''BoostMode'' : true,
         ''RedirectionStatus'' : ''Redirection started with media boost''
      }
}
```

Below Error will be shown in the response if user tries to patch BoostMode as true for a CD instance when already it is enabled for any other CD instance

```
{
   ''error'' : {
    ''@Message.ExtendedInfo'' : [
     {
        ''@odata.type'' : ''#Message.v1_0_8.Message'' ,
        ''Message'' : ''The operation failed because only one BoostMode redirection is currently
allowed and CD1 instance BoostMode support is already enabled and can no longer take incoming
requests.'' ,
        ''MessageArgs'' : [
         ''only one BoostMode redirection is currently allowed and CD1 instance BoostMode
support''
        ],
        ''MessageId'' : ''AmiOem.1.0.SupportEnabled'' ,
```

```
            "RelatedProperties" : [
                "#/BoostMode"
            ],
            "Resolution": "Disable the support and resubmit the request." ,
            "Severity" : "Critical" ,
            "retrieve_reg_id" : "AmiOem.1.0.0"
        }
    ],
    "code" : "AmiOem.1.0.SupportEnabled" ,
    "message" : "The operation failed because only one BoostMode redirection is currently allowed and CD1 instance BoostMode support is already enabled and can no longer take incoming requests."
    }
}
```

POST [Ejecting CD Media Image Redirection]

Request

```
POST

{{http_protocol}}://{{ip}}/redfish/v1/Managers/{{system_instance}}/VirtualMedia/{{CD_instance}}/Actions/VirtualMedia.EjectMedia

Content-Type: application/json
```

Example POST Request:

```
{}
```

Response

The response status is 204

3.8.8 Ethernet Interfaces

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

GET- EthernetInterface Instance

Request for EthernetInterface Instance

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

Content-Type: application/json

Response

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

Table 109 Ethernet Interface Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Specifies the AMI defined OEM properties Name / Type / Read only / Description @odata.type / String / True / Refer Section ODATA Properties HostNameSetting / String / True / This indicates whether hostname settings is in manual or auto mode. DNSEnabled / String / True / This indicates whether DNS configuration is enabled
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section 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 Resource for Status under Table Resource Complex Types.

<table>
<tr><td>InterfaceEnabled</td><td>Boolean</td><td>False</td><td>This indicates whether this interface is enabled.</td></tr>
<tr><td>PermanentMACAddress</td><td>String</td><td>True</td><td>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.</td></tr>
<tr><td>MACAddress</td><td>String</td><td>True</td><td>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
Even though 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.</td></tr>
<tr><td>SpeedMbps</td><td>Number</td><td>False</td><td>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.</td></tr>
<tr><td>StatelessAddressAutoConfig</td><td>Object</td><td>True</td><td>This object shall contain the IPv4 and IPv6 Stateless Address Automatic Configuration (SLAAC) properties for this interface.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>AutoNeg</td><td>Boolean</td><td>False</td><td>The value of this property indicates whether the speed and duplex are automatically negotiated and configured on the interface.
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.</td></tr>
</table>

<table>
<tr><td>FullDuplex</td><td>Boolean</td><td>False</td><td>The value of this property indicates whether full-duplex mode is enabled on the Ethernet connection for the interface.
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.</td></tr>
<tr><td>MTUSize</td><td>Number</td><td>False</td><td>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.
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.
MTU (Maximum Transmission Unit)
NOTE
Minimum size limit is 1280
Maximum size limit is 1500</td></tr>
<tr><td>HostName</td><td>String</td><td>False</td><td>DNS Hostname without any domain information.
NOTE
Please refer for the SPX_User Guide document for the setting constraint.</td></tr>
<tr><td>FQDN</td><td>String</td><td>False</td><td>This is the complete, fully qualified domain name obtained by DNS for this interface.</td></tr>
<tr><td>MaxIPv6StaticAddresses</td><td>Number</td><td>True</td><td>This indicates the number of array items supported by IPv6StaticAddresses.</td></tr>
<tr><td>VLAN</td><td>Object</td><td>False</td><td>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>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<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. Minimum value : 2 and Maximum value: 4094. VLANId 0, 1 & 4095 are reserved VLAN ID’s.</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>IPv4Addresses</td><td>Array of Objects</td><td>True</td><td>This array of objects represents all of the Ipv4 static addresses to be assigned on this interface. Refer Table IPv4AddressesProperties.</td></tr>
<tr><td>IPv6Addresses</td><td>Array of Objects</td><td>True</td><td>This array of objects enumerates all of the currently assigned IPv6 addresses on this interface. Refer Table IPv6AddressesProperties.</td></tr>
<tr><td>IPv6DefaultGateway</td><td>String</td><td>True</td><td>This is the Ipv6 default gateway address that is currently in use on this interface.</td></tr>
<tr><td>NameServers</td><td>Array [Items of Type String]</td><td>True</td><td>This represents DNS name servers that are currently in use on this interface.</td></tr>
<tr><td>StaticNameServes</td><td>Array [Items of type String]</td><td>False</td><td>Statically-defined set of DNS server IPv4 and IPv6 addresses.</td></tr>
<tr><td>VLANs(N)</td><td>Object</td><td>True</td><td>This is a reference to a collection of VLANs and is only used if the interface supports more than one VLANs. VLAN Network Interface Collection.
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.</td></tr>
<tr><td>LinkStatus</td><td>String</td><td>True</td><td>The value of this property shall be the link status of this interface (port).<table><tr><th>Enum</th><th>Description</th></tr><tr><td>LinkUp</td><td>The link is available for communication on this interface.</td></tr><tr><td>NoLink</td><td>There is no link or connection detected on this interface.</td></tr><tr><td>LinkDown</td><td>There is no link on this interface, but the interface is connected.</td></tr></table></td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>This object will contain the actions for this resource under Oem property if any.</td></tr>
<tr><td>DHCPv4</td><td>Object</td><td>False</td><td>This property shall contain the configuration of DHCP v4 as given in below Table DHCPv4 Properties.</td></tr>
<tr><td>DHCPv6</td><td>Object</td><td>False</td><td>This property shall contain the configuration of DHCP v6 as given in below Table DHCPv6 Properties.</td></tr>
<tr><td rowspan="2">IPv6StaticDefaultGateways</td><td rowspan="2">Array of Objects</td><td>False</td><td>The values in this array shall represent the IPv6 static default gateway addresses for this interface.
PRJ support : IPV6_COMPLIANCE and SUPPORT_BOTH_IPMIIPV6_AND_AMIOEM_LAN_PARAM</td></tr>
<tr><td>True</td><td>The values in this array shall represent the IPv6 static default gateway addresses for this interface.
PRJ support : IPV6_COMPLIANCE and SUPPORT_IPMIIPV6_LAN_PARAM_ONLY</td></tr>
<tr><td>IPv6StaticAddresses</td><td>Array of Objects</td><td>False</td><td>The value of this property shall be an array of objects used to represent the IPv6 static connection characteristics for this interface. Refer Table IPv6StaticAddresses Properties</td></tr>
</table>

			below. Platform specific porting needed; require specific platform libraries support and hook between the specific libraries and gami module should be added.; Refer Manager EthernetInterface under Platform specific Properties in "How to Add OEM extensions" document.
IPv4StaticAddresses	Array of Objects	False	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 IPv6StaticAddresses Properties below. **NOTE** *Only one set of IPv4StaticAddresses can be patched and multiple IPv4StaticAddresses patch is not supported.*
IPv6AddressPolicyTable	Array	True	The value of this property represents the RFC6724-defined address selection policy table. *Refer Table IPv6AddressPolicyTable Properties* **NOTE** *Northbound only support.*

Table 110 IPv4 Addresses Properties

Name	Type	Read Only	Description	
Address	String	True	This property shall contain an IPv4 address assigned to this interface.	
SubnetMask	String	True	This property shall contain the IPv4 subnet mask for this address.	
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
			LinkLocal	Address is valid only for this network segment (link).
Gateway	String	True	This property shall contain the IPv4 default gateway address for this interface.	

Table 111 IPv6 Addresses Properties

Name	Type	Read Only	Description
Address	String	True	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:0, Max:128
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 112 DHCPv4 Properties

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

Table 113 DHCPv6 Properties

Name	Type	Read Only	Description
OperatingMode	String	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	True	When enabled, DNS server addresses supplied through DHCPv6 stateless mode will be used. **NOTE** *Northbound only support.*
UseDomainName	Boolean	True	When enabled, the domain name supplied through DHCPv6 stateless mode will be used. **NOTE** *Northbound only support.*
UseNTPServers	Boolean	True	When enabled, NTP server addresses supplied through DHCPv6 stateless mode will be used. **NOTE** *Northbound only support.*
UseRapidCommit	Boolean	True	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 114 IPv6StaticAddresses 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:0,Max:128
Oem	Object	True	StaticIPAddressIndex under Ami.

Table 115 IPv4StaticAddresses Properties

Name	Type	Read Only	Description	
Address	String	False	This property shall contain an IPv4 address assigned to this interface.	
SubnetMask	String	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}$"	
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
			LinkLocal	Address is valid only for this network segment (link).

Table 116 IPv6AddressPolicyTable Properties

Name	Type	Read Only	Description
Label	Integer	False	This property shall contain the IPv6 label value for this table entry, as defined in RFC6724. **NOTE** *Northbound only support*
Precedence	Integer	False	*This property shall contain the IPv6 precedence value for this table entry, as defined in RFC6724.* **NOTE** *Northbound only support*
Prefix	Integer	False	This property shall contain the IPv6 address prefix for this table entry, as defined in RFC6724. **NOTE** *Northbound only support*

NOTE
USB interfaces which support LanOverUsb is also populated in this collection, these resources will only have limited properties.

PATCH

NOTE
When successful patch is applied for EthernetInterfaces, task will be initiated and network settings change starts in the backend which will be independent of redfish control. Once changes are updated in backend, task gets completed successfully, it indicates the patch is successful and we can check the changes through GET response irrespective of whether network restart process is fully completed in the backend or not.
Please note if the task is completed and network restart continues in backend, when we check for GET response their may be connection on/off due to network restart

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

Sample PATCH Request Bodies
Sample patch request body for ethernet-interface properties for interface instance uri,
Ex: PATCH *https://{{ip}}/redfish/v1/Managers/{{system_instance}} /EthernetInterfaces/eth0*

To Modify HostName and FQDN

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

```
}
```

NOTE
For details, please refer to the Technology Pack User Guide
Section 3.8.8 EthernetInterface PATCH [Manager EthernetInterface Instance]

To Disable AutoNeg or To Change FullDuplex/SpeedMbps

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

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

To Enable AutoNeg

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

To Modify MTUSize

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

To Set StaticNameServers

```
{
      "StaticNameSevers":
      [
            "10.0.0.33",
            "10.0.0.34",
            "10.0.0.35"
      ]
}
```

IPv4 Related Requests

To Disable DHCP for IPv4 Addresses

```
{
      "DHCPv4" : {
            "DHCPEnabled" : false
      },
      "IPv4StaticAddresses" : [
                  {
                        "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

To enable DHCP, we need to pass a value of true to DHCPEnabled attribute and to disable DHCP, we need to pass a value of false to DHCPEnabled attribute.

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

To Enable/Disable Interface

To enable Interface, we need to pass a value of true to InterfaceEnabled attribute and to disable Interface, we need to pass a value of false to InterfaceEnabled attribute.

```
{
    "InterfaceEnabled" : true
}
```

NOTE

If we PATCH "InterfaceEnabled" to false along with other settings together, request is accepted but only interface will be disabled.

To enable/disable bond, patch need to be applied for InterfaceEnabled property through bond0 instance only.

PATCH *https://{{ip}}/redfish/v1/Managers/{{system_instance}}/EthernetInterfaces/bond0*

For Enabling Bond Interface

```
{
    "InterfaceEnabled" : true
}
```

For Disabling Bond Interface

```
{
    "InterfaceEnabled" : true
}
```

If bond is disabled*, bond0 will show minimal properties and eth0/eth1 will show all properties.*

If bond is enabled*, bond0 will show all properties and eth0/eth1 will show minimal properties.*

If bond is enabled*, Applying patch for InterfaceEnabled property through eth0/eth1 instance is restricted and will throw error.*

```
{
    "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
}
```

IPv6 Related Requests

To Disable DHCP in IPv6 Addresses

Allowable values for DHCPv6 OperatingMode are - Disabled, Stateless, Stateful

```
{
    "DHCPv6" :
    {
        "OperatingMode" : "Disabled"
    },
    "IPv6StaticAddresses" : [
        {
            "Address" : "2001:b021:2d:0:475e:a232:7e1d:7438" ,
            "PrefixLength" : 64,
            "Oem" :
            {
              "Ami" :
              {
                  "StaticIPAddressIndex" : 10
              }
            }
        }
    ]
}
```

To Modify IPv6StaticAddress Details

```
{
  "IPv6StaticAddresses" : [
    {
      "Address" : "b021:2d:0:475e:a232:7e1d:7438" ,
      "PrefixLength" : 64,
      "Oem" : {
        "Ami" : {
          "StaticIPAddressIndex" : 10
        }
      }
    }
  ]
}
```

To Set Multiple IPv6StaticAddress Details

```
{
    "IPv6StaticAddresses" : [
        {
            "Address" : "2001::15" ,
            "PrefixLength" : 64,
            "Oem" :
            {
                "Ami" :
                {
```

```
                                        "StaticIPAddressIndex" : 10
                                }
                        }
                },
                {
                        "Address" : "2001::11" ,
                        "PrefixLength" : 64,
                        "Oem" :
                        {
                                "Ami" :
                                {
                                        "StaticIPAddressIndex" : 10
                                }
                        }
                }
        ],
        "DHCPv6"
        {
                "OperatingMode": "Disabled"
        }
}
```

To Modify Multiple IPv6StaticAddress Details

```
{
    "IPv6StaticAddresses" : [
     {
        "Address" : "2001:b021:2d:0:475e:a232:7e1d:7438" ,
        "Oem" : {
           "Ami" : {
              "StaticIPAddressIndex" : 10
           }
        },
        "PrefixLength" : 64
     },
     {
        "Address" : "2001:b021:2d:0:475e:a232:7e1d:7440" ,
        "Oem" :
        {
           "Ami" :
           {
              "StaticIPAddressIndex" : 11
           }
        },
        "PrefixLength" : 64
     }
    ]
}
```

To Clear IPv6StaticAddress Details

NOTE
PrefixLength is optional , IPv6StaticAddress can be cleared with or without PrefixLength

With PrefixLength

```
{
      "IPv6StaticAddresses" : [
                {
```

```
                    "Address" : null,
                    "PrefixLength" : 64,
                    "Oem" :
                    {
                            "Ami" :
                            {
                                    "StaticIPAddressIndex" : 10
                            }
                    }
            }
    ]
}
```

Without PreFixlength

```
{
    "IPv6StaticAddresses" : [
            {
                    "Address" : null,
                    "Oem" :
                    {
                            "Ami" :
                            {
                                    "StaticIPAddressIndex" : 10
                            }
                    }
            }
    ]
}
```

To Enable DHCP in IPv6

To enable DHCP, we need to pass a value of "Stateless" or "Stateful" to OperatingMode attribute and to disable DHCP, we need to pass a value of "Disabled" to OperatingMode attribute.

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

```
{
    "DHCPv6" :
    {
            "OperatingMode" : "Disabled"
    }
}
```

To Set Static Default Gateway for IPv6

NOTE
We cannot provide IPv6StaticDefaultGateways alone when DHCPv6 is enabled.

```
{
    "DHCPv6" : {
            "OperatingMode" : "Disabled"
    },
    "IPv6StaticAddresses" : [
            {
```

```
                    "Address" : "2001:b012:1d:0:185e:a132:4a4a:1516" ,
                    "PrefixLength" :64,
                    "Oem" :
                    {
                        "Ami" :
                        {
                            "StaticIPAddressIndex" : 0
                        }
                    }
                }
        ],
        "IPv6StaticDefaultGateways" : [
                {
                    "Address" : "2001:b021:2d::"
                }
        ]
}

{-OR-}

{
        "IPv6StaticDefaultGateways" : [
                {
                    "Address" : "2001:b021:abcd:0:8c8:4bff:fefd:f333"
                 }
        ]
}
```

NOTE

- *For an interface, when IPv6 is in DHCP mode, IPv6DefaultGateways attribute alone will be shown*
- *For an interface, when IPv6 is in Static mode IPv6DefaultGateways attribute will be shown as null value and IPv6StaticDefaultGateways attribute will not be shown.*
- *For IPv6StaticDefaultGateways attribute to be shown in the response, we need to apply PATCH for IPv6StaticDefaultGateways attribute as shown below :*

```
{
        IPv6StaticDefaultGateways" : [
                {
                    "Address" : "fe80::4637:e6ff:febe:266e"
                }
        ]
}
```

Once IPv6StaticDefaultGateways PATCH is applied, then both IPv6DefaultGateways and IPv6StaticDefaultGateways attributes will have the same value.

To Disable Domain Name System (DNS)

```
{
    "Oem":
    {
        "Ami":
        {
            "DNSEnabled": false
        }
    }
}
```

To enable DNS, we need to pass a value of true to DNSEnabled attribute and to disable DNS, we need to pass a value of false to DNSEnabled attribute. When the DNSEnabled attribute is having a value of false, we will not be able to modify the attributes - FQDN, HostName and StaticNameServers.

To Set HostNameSetting to Manual
To set HostNameSetting to Manual mode, we need to pass value for either of the attributes - FQDN and HostName and also the value of ''DNSEnabled'' attribute should be true. If the value of ''DNSEnabled'' attribute is in false state, we will be getting error when we try to set HostNameSetting to Manual mode.

```
{
	"HostName": "AMI4EF4B4D8FF61",
	"Oem":
	{
		"Ami":
		{
			"HostNameSetting": "Manual"
		}
	}
}
```

Errors

NOTE
When we try to enable/disable bond interface when bond mode is disabled we will receive the following error

```
{
	''error'' : {
	  ''@Message.ExtendedInfo'' : [
	    {
		''@odata.type'' :'' #Message.v1_0_8.Message'' ,
		''Message'': ''InterfaceEnabled property is read-only for bond0 interface.'',
		''MessageArgs'' : [
		  ''InterfaceEnabled''
		],
		''MessageId'' : ''SyncAgent.1.0.InterfaceEnabledBondInterface'' ,
		''RelatedProperties'' : [
		  ''/InterfaceEnabled''
		],
		''Resolution'' : ''InterfaceEnabled property can be applied only for eth0 or eth1
instance'' ,
		''Severity'' : ''Warning''
	    }
	  ],
	  ''code'' : ''SyncAgent.1.0.InterfaceEnabledBondInterface'' ,
	  ''message'': ''InterfaceEnabled property is read-only for bond0 interface.''
	}
}
```

When we try to enable/disable interface for eth0/eth1/bond0 when bond mode is enabled we will receive the following error response,

```
{
  ''error'' : {
    ''@Message.ExtendedInfo'' : [
      {
      ''@odata.type'' : ''#Message.v1_0_8.Message'' ,
```

```
        "Message" : "InterfaceEnabled property patch cannot be applied for bond0/eth0/eth1
instance if bond is enabled" ,
        "MessageArgs" : [
          "InterfaceEnabled"
        ],
        "MessageId" : "SyncAgent.1.0.InterfaceEnabledBondEnabled" ,
        "RelatedProperties" : [
          "/InterfaceEnabled"
        ],
        "Resolution" : "Remove the property from the request body and resubmit the request if the
operation failed" ,
        "Severity" : "Warning"
      }
   ],
   "code" : "SyncAgent.1.0.InterfaceEnabledBondEnabled" ,
   "message" : "InterfaceEnabled property patch cannot be applied for bond0/eth0/eth1 instance if
bond is enabled"
   }
}
```


Response

The response status is 202 with newly created Task details. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.9 Accounts API

3.9.1 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.

GET

Request

```
https://{{ip}}/redfish/v1/AccountService
Content-Type: application/json
```

Response

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

Table 117 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 118 Search Settings 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 curently supports only one BaseDistinguishedName.*
UsernameAttribute	String	False	The value of this property shall be the attribute name that contains the Username.

Table 119 Account Service Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
Status	Object	True	Refer Section Resource for Resource.Oem. **NOTE** *HealthRollup is not applicable.*
ServiceEnabled	Boolean	False	This indicates whether this service is enabled.Default it will be True value. If the value for this property is false, then service is disabled and Redfish Users cannot be created, deleted, or modified, and new sessions cannot be created. However, established sessions may still continue to run. This does not affect any Authentication connections.
AuthFailureLoggingThreshold	Number	False	This value represents the threshold for when an authorization failure is logged. Logging shall occur after every `n` occurrences of an authorization failure on the same account, where `n` represents the value of this property. **NOTE** • *Maximum value allowed is 50, the default being 3.* • *If the value is 0, logging of authorization failures shall be disabled.* • *Setting this value to 1 would log every authentication failure. Two means every 2nd attempt, three is every 3rd attempt, and so forth.* • *It will reset back to 0 on a succesfull login attempt from the same account.*
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.*
AccountLockoutThreshold(C)	Number	False	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 5. **NOTE** • *Maximum value allowed is 100.* • *Account Lockout feature is applicable only for redfish defined account not for remote accounts like LDAP, AD, RADIUS etc.*
AccountLockoutDuration(C)	Number	False	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. **NOTE** • *Maximum value allowed is 10000* • *Default value for this property is 30* • *Account Lockout feature is applicable only for redfish defined account not for remote accounts like LDAP, AD, RADIUS etc.*
AccountLockoutCounterResetAfter(C)	Number	False	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.

			NOTE • *Maximum value allowed is 10000* • *Default value for this property is 30* • *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	This property shall govern how the service uses the Accounts collection within this AccountService as part of authentication. Details about each of the modes are found in the description of the enum values. Refer: Enum Properties for LocalAccountAuth **NOTE** *The default value for this property shal be "LocalFirst".*
AccountLockoutCounterResetEnabled	Boolean	False	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 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. **NOTE** • *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.* • *When "AccountLockoutCounterResetEnabled" is false and hacker keep trying request with wrong credentials.* *Result: The account will be locked forever, the user with Administrator privilege can unlock it and if all Administrator accounts are locked then user can access Redfish only after factory restore defaults.* *Please refer documentation "MegaRAC*

			Redfish – FAQ Document" for setup config constant.
LDAP	Object	False	Refer Table LDAP Properties. Default it will be null value
ActiveDirectory	Object	False	Refer Table Active Directory Properties
AdditionalExternalAccountProviders	Object	True	This property shall contain the additional external account providers that this Account Service uses. Refer Section ExternalAccountProvider Collection

Table 120 LDAP Properties

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

Name	Type	Read Only	Description
AuthenticationType	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 Account Service LDAP OEM Properties for Oem AMI LDAP*

			Properties.
LDAPService	Object	False	Refer Table LDAP Propreties
RemoteRoleMapping	Array	False	Refer Table RoleMapping Properties
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. **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 curently supports only one ServiceAddress* *If user provides ipv6 ServiceAddress, it is mandatory to provide port number in the end.* Example : ServiceAddresses : "2001:b021:abcd::8c8:4bff:fefd:f899:389" In the above serviceaddresses, 2001:b021:abcd::8c8:4bff:fefd:f899 -> IPv6 Adddress 389 -> Port Number

LDAPService Properties

Table 121 LDAP Service Properties

Name	Type	Read Only	Description
SearchSettings	Object	False	The required settings to search an external LDAP service. Refer Table SearchSettings Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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.*

Active Directory Properties

Table 122 Active Directory Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="5">Authentication</td><td rowspan="5">Object</td><td rowspan="5">False</td><td>Active Directory properties containing authentication details
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Username</td><td>String</td><td>False</td><td>The user name for the Service.
Username should be String with Minimum length = 1 and Maximum length = 64 of alpha-numeric characters.
Username must start with an alphabetical character.
NOTE
This property will not allow whitespaces and special characters.</td></tr>
<tr><td>Password</td><td>String</td><td>False</td><td>The password for this Service.
The password length must be at least 6 characters long and whitespaces are not allowed.
A PATCH or PUT request writes the password. This property is `null` in responses.
NOTE
This property will not allow more than 127 characters.</td></tr>
<tr><td>AuthenticationType</td><td>String</td><td>True</td><td>The type of authentication used to connect to the external account provider.
NOTE
Value is “UsernameAndPassword” for Active Directory.</td></tr>
<tr><td>Oem</td><td>Object</td><td>False</td><td>OEM extension object
NOTE
Refer section Account Service Active Directory Oem Properties for Oem AMI Active Directory Properties.</td></tr>
</table></td></tr>
<tr><td>RemoteRoleMapping</td><td>Array</td><td>False</td><td>Refer Table RoleMapping properties.</td></tr>
<tr><td>ServiceEnabled</td><td>Boolean</td><td>False</td><td>An indication of whether this service is enabled.</td></tr>
</table>

Table 123 Role Mapping Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="5">RemoteRoleMapping</td><td rowspan="5">Array</td><td rowspan="5">False</td><td>The mapping rules to convert the external account providers account information to the local Redfish Role.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>LocalRole</td><td>String</td><td>False</td><td>The name of the local Redfish Role to which to map the remote user or group.</td></tr>
<tr><td>RemoteGroup</td><td>String</td><td>False</td><td>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. Remote Group is a string maximum 255 alphanumeric characters are allowed. Special symbols hyphen(-) and underscore(_) are allowed.
NOTE
The RemoteGroup name should be unique for each RoleGroup. Two RoleGroup cannot have same RemoteGroup(group name) in BMC.</td></tr>
<tr><td>RemoteUser</td><td>String</td><td>False</td><td>The name of the remote user that maps to the local Redfish Role to which this entity links. Remote User is string with maximum 64 alpha numeric characters and special symbols hyphen(-),dot(.) and underscore(_) are allowed.</td></tr>
<tr><td>Oem</td><td>Object</td><td>False</td><td>OEM extension object
NOTE
Refer section Account Service</td></tr>
</table></td></tr>
</table>

						Active Directory Oem Properties for Oem AMI Active Directory Properties.

PATCH

Request

```
PATCH https://{{ip}}/redfish/v1/AccountService
Content-Type: application/json
```

Request Body

Please refer to the properties that are patchable in Table 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
}
```

Response

1. If the Request Body contains attributes from LDAP or ActiveDirectory, then the Response Status Code will be 202 OK and the Response Body contains an additional ExtendedInfo Message as below, in addition to the existing response body:

```
{
   "@odata.context" : "/redfish/v1/$metadata#Task.Task" ,
   "@odata.id" : "/redfish/v1/TaskService/Tasks/1" ,
   "@odata.type" : "#Task.v1_4_2.Task" ,
   "Description" : "Task for AccountService ActiveDirectory" ,
   "Id" : "1" ,
   "Name" : "AccountService ActiveDirectory" ,
   "TaskMonitor": "/redfish/v1/TaskService/TaskMonitors/1",
   "TaskState" : "New"
   }
```

2. If the Request Body contains attributes other than LDAP and AD attributes, then the Response Status Code will be 204 No Content with no Response Body.

PATCH LDAP & LDAP Service

Request

```
https://{{ip}}/redfish/v1/AccountService
Content-Type: application/json
```

Request Body

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

Example Request Body for Editing AccountService:

```
{
    "LDAP" : {
        "Authentication" : {
            "Password" : "000000"
            "Username" : "cn=Manager,dc=megarac,dc=qa11111111" ,
            "Oem" : {
              "Ami" : {
                "EncryptionType" : "NoEncryption" ,
                "CommonNameType" : "IPAddress"
              }
            }
        },
        "RemoteRoleMapping" : [
        {
            "LocalRole" : "Administrator" ,
            "RemoteGroup" : "ldaprg1" ,
            "RemoteUser" : "ou=testgroup,dc=qa"
        },
        {
            "LocalRole" : "Operator" ,
            "RemoteGroup" : "ldapng2" ,
            "RemoteUser" : "ou=testgroup,dc=megarac,dc=qa"
        },
        {
            "LocalRole" : "User" ,
            "RemoteGroup" : "ldaprg3" ,
            "RemoteUser" : "ou=testgroup,dc=megarac,dc=qa"
        }
        ],
        "LDAPService" : {
            "SearchSettings" : {
                "BaseDistinguishedNames" : [
                    "dc=megarac,dc=q111111"
                ],
                "UsernameAttribute" : "cn"
            }
        },
        "ServiceAddresses" : [
            "192.168.0.110:111"
        ],
        "ServiceEnabled" : true
    }
}
```

Respnse

For a detailed information on both Success and Error Responses, refer PATCH Response.

PATCH LDAP Remote Role Mapping

This operation is used to configure LDAP RemoteRoleMapping.
User can able to create / modify / delete the RemoteRoleMapping of LDAP using this Patch operation.
The "RoleID" OEM property is non-patchable. During LDAP RemoteRoleMapping patch operation, "RoleID" OEM property will be generated internally and will be displayed in GET response which value ranges from 1-5.
"KVMAccess" and "VMediaAccess" OEM properties are not mandatory to be

passed in the Request body. If they are not given, then by default ‘‘false’’ value will be set for ‘‘KVMAccess’’ and ‘‘VMediaAccess’’.
Totally 5 RemoteRoles can be configured. To delete a particular role, null value should be passed in the array element.
For example, if user wants to delete the third Role, which RoleID would be 3, then in the request body, null value should be passed as third array element. First two array elements can be empty array.

PATCH Request

```
https://{{ip}}/redfish/v1/AccountService
Content-Type: application/json
```

Sample Request Body for Creating RemoteRoleMapping:

Below example is to create Three RemoteGroups ‘‘group1’’, ‘‘group3’’ and ‘‘group5’’.

KVMAccess and VMediaAccess of Role1, will be configured as Enabled. For remaining roles it will be configured as Disabled in the GET response

```
{
   ‘‘LDAP’’ : {
      ‘‘RemoteRoleMapping’’ : [
         {
            ‘‘LocalRole’’ : ‘‘Administrator’’ ,
            ‘‘RemoteGroup’’ : ‘‘group1’’ ,
            ‘‘RemoteUser’’ : ‘‘Active2’’ ,
            ‘‘Oem’’ :{
               ‘‘Ami’’ :{
                  ‘‘KVMAccess’’ : true ,
                  ‘‘VMediaAccess’’ : true
               }
            }
         },
         {},
         {
            ‘‘LocalRole’’ : ‘‘Operator’’ ,
            ‘‘RemoteGroup’’ : ‘‘group3’’ ,
            ‘‘RemoteUser’’ : ‘‘Active2’’
         },
         {},
         {
            ‘‘LocalRole’’ : ‘‘Operator’’ ,
            ‘‘RemoteGroup’’ : ‘‘group5’’ ,
            ‘‘RemoteUser’’ : ‘‘Active23’’
         }
      ]
   }
}
```

Sample Request Body to Modify/ Delete RemoteRoleMapping:

Below example is to update Role1 and Role5 and to delete Role2 and Role3

```
{
      ‘‘LDAP’’ : {
            ‘‘RemoteRoleMapping’’ : [
                  {
                     ‘‘LocalRole’’ : ‘‘Administrator’’ ,
                     ‘‘RemoteGroup’’ : ‘‘group1’’ ,
```

```
                "RemoteUser" :" testuser1" ,
                "Oem" :{
                        "Ami" :{
                                "KVMAccess" : true ,
                                "VMediaAccess" : true
                        }
                }
            },
            null, ----> Second Role If any , will be deleted
            null, ----> Third Role If any , will be deleted
            {}, ----> Second Role If any , will be left unchanged
            {
                "LocalRole" : "Operator" ,
                "RemoteGroup" : "group5" ,
                "RemoteUser" : "testuser5"
            }
        ]
    }
}
```

Below example is to delete all the LDAP Roles

```
{
    "LDAP" : {
        "RemoteRoleMapping" : [
            null,null,null,null,null
        ]
    }
}
```

Below example is to update only the first element.

```
{
    "LDAP" : {
        "RemoteRoleMapping" : [
            {
                "LocalRole" : "Administrator" ,
                "RemoteGroup" : "group1" ,
                "RemoteUser" : "testuser1" ,
                "Oem" :{
                    "Ami" :{
                            "KVMAccess" : true ,
                            "VMediaAccess" : true
                    }
                }
            }
        ]
    }
}
```

Response

For a detailed information on both Success and Error Responses, refer PATCH Response.

PATCH Active Directory

Request

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

Content-Type: application/json

Request Body

Please refer to the properties that are patchable in Table 112 Account Service Property for which ReadOnly is False that can be sent as Request body in json format.

Example Request Body for Editing AccountService:

```
{
        "ActiveDirectory" : {
                "Authentication" : {
                        "Username" : "AD1",
                        "Password" : "AD@123",
                        "Oem" : {
                                "Ami" : {
                                        "DomainName" : "abc123.com",
                                        "DomainControllerServerAddr1" : "10.0.1.23",
                                        "DomainControllerServerAddr2" : "",
                                        "DomainControllerServerAddr3" : ""
                                }
                        }
                },
                "ServiceEnabled" :true
        }
}
```

Response

For a detailed information on both Success and Error Responses, refer PATCH Response.

PATCH Active Directory Remote Role Mapping

This operation is used to configure Active Directory RemoteRoleMapping.

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

The ''GroupID'' OEM property is non-patchable. During AD RemoteRoleMapping patch operation, ''GroupID'' OEM property will be generated internally and will be displayed in GET response which value ranges from 1-5.

''KVMAccess'' and ''VMediaAccess'' OEM properties are not mandatory to be passed in the Request body. If they are not given, then by default false value will be set for ''KVMAccess'' and ''VMediaAccess''

Totally 5 RemoteRoles can be configured. To delete a particular role, null value should be passed in the array element.

For example, if user wants to delete the third Role, which GroupID would be 3, then in the request body, null value should be passed as third array element. First two array elements can be empty array.

PATCH Request

```
https://{{ip}}/redfish/v1/AccountService
Content-Type: application/json
```

Sample Request Body for Creating RemoteRoleMapping:
Below example is to create three RemoteGroups ‘‘group1’’, ‘‘group3’’ and ‘‘group5’’. KVMAccess and VMediaAccess of Role1, will be configured as Enabled. For remaining roles it will be configured as Disabled in the GET response

```
{
    ‘‘ActiveDirectory’’ : {
        ‘‘RemoteRoleMapping’’ : [
            {
                ‘‘LocalRole’’ : ‘‘Administrator’’ ,
                ‘‘RemoteGroup’’ : ‘‘group1’’ ,
                ‘‘RemoteUser’’ : ‘‘Active2’’ ,
                ‘‘Oem’’ :{
                  ‘‘Ami’’ :{
                    ‘‘KVMAccess’’ : true ,
                    ‘‘VMediaAccess’’ : true
                  }
                }
            },
            {},
            {
                ‘‘LocalRole’’ : ‘‘Operator’’ ,
                ‘‘RemoteGroup’’ : ‘‘group3’’ ,
                ‘‘RemoteUser’’ : ‘‘Active2’’
            },
            {},
            {
                ‘‘LocalRole’’ : ‘‘Operator’’ ,
                ‘‘RemoteGroup’’ : ‘‘group5’’ ,
                ‘‘RemoteUser’’ : ‘‘Active23’’
            }
        ]
    }
}
```

Sample Request Body to Modify/ Delete RemoteRoleMapping:
Below example is to update Role1 and Role5 and to delete Role2 and Role3

```
{
  ‘‘ActiveDirectory’’ : {
      ‘‘RemoteRoleMapping’’ : [
          {
              ‘‘LocalRole’’ : ‘‘Administrator’’ ,
              ‘‘RemoteGroup’’ : ‘‘group1’’ ,
              ‘‘RemoteUser’’ : ‘‘testuser1’’ ,
              ‘‘Oem’’ :{
                  ‘‘Ami’’ :{
                      ‘‘KVMAccess’’ : true ,
                      ‘‘VMediaAccess’’ : true
                  }
              }
          },
          null, ----> Second Role If any , will be deleted
          null, ----> Third Role If any , will be deleted
```

```
                {}, ----> Second Role If any , will be left unchanged
                 {
                        "LocalRole" : "Operator" ,
                        "RemoteGroup" : "group5" ,
                        "RemoteUser" : "testuser5"
                }
        ]
    }
}
```

Below example is to delete all the AD Roles

```
{
      "ActiveDirectory" : {
            "RemoteRoleMapping" : [
                  null,null,null,null,null
            ]
      }
 }
```

Below example is to update only the first element.

```
{
    "ActiveDirectory" : {
          "RemoteRoleMapping" : [
                {
                      "LocalRole" : "Administrator" ,
                      "RemoteGroup" : "group1" ,
                      "RemoteUser" : "testuser1" ,
                      "Oem" :{
                        "Ami" :{
                                  "KVMAccess" : true ,
                                  "VMediaAccess" : true
                        }
                       }
                }
        ]
    }
}
```

Response

For a detailed information on both Success and Error Responses, refer PATCH Response.

3.9.2 External Account Provider Collection

This represents the collection of External Account Provider resources.

GET

Request

```
https://{{ip}}/redfish/v1/AccountService/ExternalAccountProviders
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.9.3 External Account Provider

This resource contain properties that represent ExternalAccountProvider services that can provide accounts for this manager to use for authentication. ExternalAccountProvider will be available only when RADIUS is enabled in PRJ. Refer Section RADIUS Authentication for RADIUS Authentication.

3.9.4 Manager Account Collection

It is a collection of resources that represents the user accounts

GET

Request

```
https://{{ip}}/redfish/v1/AccountService/Accounts
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

POST [Creating new Account]

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
```

```
}
```

Request [Creating new SNMP Account]

```
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,
   "AccountTypes" :[ "Redfish", "SNMP" ],
   "Oem" :{
         "Ami" :{
               "SNMP" :{
                     "AuthenticationProtocol" : "SHA256",
                     "EncryptionProtocol" : "DES",
                     "Access" : "ReadOnly"
               }
         }
   }
}
```

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 "Redfish Error Response" and Section "Status Codes".

3.9.5 Manager Account

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

GET

Request

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

Content-Type: application/json

Response

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

Table 124 Manager Account Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 table Oem Object for more information
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section Resource
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. **NOTE** *Both Redfish and WebUI side will not allow to create an account with same username in Unified user disable case when SNMP is enabled.*
RoleId	String	False	The value of this property shall be the ID of the Role resource that configured for this account.
Locked	Boolean	False	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. 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. 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. **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.*
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 over-rides the locked property. **NOTE** *By default, the account service will set the value of "Enabled" to false if this property is not available in the request payload.*
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.
PasswordChangeRequired	Boolean	True	Indicates that the password for this account must be changed. The service requires the password to be changed before access is allowed. 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. When the "Password" property for this account is updated, the service shall set the value to false. 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. **NOTE** *PasswordChangeRequired cannot be modified by PATCH because of the security*

<table>
<tr><td></td><td></td><td></td><td>concern of California Law.</td></tr>
<tr><td>Certificates</td><td>Object</td><td>True</td><td>The link to a collection of certificates used for this account.</td></tr>
<tr><td>Links</td><td>Object</td><td></td><td>The links object contains the links to other resources that are related to this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Role</td><td>Object</td><td>True</td><td>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.</td></tr>
</table></td></tr>
<tr><td>AccountTypes</td><td>Array</td><td>False</td><td>Contains various account types that apply to the account.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>Redfish</td><td>Allow access to Redfish Service</td></tr>
<tr><td>SNMP</td><td>Allow access to SNMP Service</td></tr>
</table></td></tr>
<tr><td>SNMP</td><td>Object</td><td>True</td><td>SNMP Settings for this account.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>AuthenticationKeySet</td><td>Boolean</td><td>True</td><td>Indicates AuthenticationKey property is set</td></tr>
<tr><td>EncryptionKeySet</td><td>Boolean</td><td>True</td><td>Indicates Encryption Key property is set</td></tr>
</table></td></tr>
</table>

Table 125 Table Properties for Oem Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="5">Ami</td><td rowspan="5">Object</td><td rowspan="5">True</td><td>Contains information related to AMI features supported by the service.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>Authentication Protocol</td><td>String</td><td>False</td><td>Authentication Protocol for SNMPv3 Account.
Below are supported Enum properties.
• SHA256
• SHA384
• SHA512</td></tr>
<tr><td>EncryptionProtocol</td><td>String</td><td>False</td><td>Encryption Protocol for SNMPv3 Account.
Below are supported Enum properties
• DES
• AES</td></tr>
<tr><td>Access</td><td>String</td><td>False</td><td>Access for SNMPv3 Account. Below are supported Enum properties
• ReadOnly
• ReadWrite</td></tr>
</table></td></tr>
</table>

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

Example Request Body for Editing an Account:

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

Request[Add SNMP Account]

```
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 124 Manager Account Property for which ReadOnly is False that can be sent as Request body in json format.

Example Request Body for Adding SNMP Account:

```
{
   "AccountTypes" :[ "Redfish" , "SNMP" ],
   "Oem" : {
         "Ami" :{
               "SNMP" : {
                     "AuthenticationProtocol" : "SHA384" ,
                     "EncryptionProtocol" :"AES" ,
                     "Access" : "ReadOnly"
               }
         }
   }
}
```

Request[Delete SNMP Account]

```
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 Manager Account Property for which ReadOnly is False that can be sent as Request body in json format.

Example Request Body for Delete SNMP Account:

```
{
   "AccountTypes" :[ "Redfish" ]
}
```

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Code".

DELETE

Request

```
DELETE    https://{{ip}}/redfish/v1/AccountService/Accounts/{{account_instance}}
Content-Type: application/json
```

Response

The response status is 204 and no response body. For Error Responses refer Section "Redfish Error Response" and Section "Status Code".

3.9.6 Role Collection

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

GET

Request

```
https://{{ip}}/redfish/v1/AccountService/Roles
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

POST [Creating new Custom Role]

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"
   ]
}
```

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 "Redfish Error Response" and Section "Status Codes".

3.9.7 Role

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

GET

Request

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

Content-Type: application/json

Response

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

Table 126 Role Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
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 Privilege Registy 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
Configure Manager	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

<table>
<tr><td></td><td></td><td></td><td colspan="2">managed by this service.</td></tr>
<tr><td rowspan="3">OemPrivileges</td><td rowspan="3">Array</td><td rowspan="3">False</td><td colspan="2">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.</td></tr>
<tr><td>Enum</td><td>Description</td></tr>
<tr><td>Configure HostInterface</td><td>Able to configure HostInterface resources
NOTE
Only HostInterfaceAdministrator role is allowed to own this privilege and it cannot be assigned to another role.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td colspan="2">This object will contain the actions for this resource under Oem property if any.</td></tr>
<tr><td>RoleId</td><td>String</td><td>True</td><td colspan="2">This property shall contain the string name of the Role. This property shall contain the same value as the Id property.</td></tr>
</table>

PATCH

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 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"
    ]
}
```

Response

The response status is success with status code as 204 and the updated Role. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

DELETE

Request

```
DELETE https://{{ip}}/redfish/v1/AccountService/Roles/{{role_instance}}
Content-Type: application/json
```

Request Body

The response status is 204 and no response body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.10 Event Service API

3.10.1 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).

GET

Request

```
https://{{ip}}/redfish/v1/EventService
Content-Type: application/json
```

Response

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

Table 120 Event Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource.
ServiceEnabled(C)	Boolean	False	This indicates whether this service is enabled. Default value will be true.
DeliveryRetryAttempts(C)	Number	False	The number of retrys 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.

<table>
<tr><td>EventFormatTypes</td><td>Array</td><td>True</td><td>The types of the message that this service can sent to the event destination.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>MetricReport</td><td>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.</td></tr><tr><td>Event</td><td>The Subscription destination will receive JSON bodies as Event format for all other types of Events.</td></tr></table></td></tr>
<tr><td>RegistryPrefixes</td><td>Array</td><td>True</td><td>Prefixes of Message Registries that shall be allowed for an Event Subscription.
NOTE
Supported RegistryPrefixes are:-
[“EventLog” , “SyncAgent” , “Security’ , “IPMI”, “HttpStatus” , “Base” , “Task”]</td></tr>
<tr><td>ResourceTypes</td><td>Array</td><td>True</td><td>ResourceTypes values that shall be allowed for an Event Subscription.
NOTE
Supported ResourceTypes are:-
[“Systems” , “Chassis” ,”AccountService”, “TelemetryService” , “Managers” , “EventService”, “TaskService”]</td></tr>
<tr><td>SubordinateResourcesSupported</td><td>Boolean</td><td>True</td><td>Indicated Support the SubordinateResource property on Event Subscription.
NOTE
Default value is false.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>The Actions object contains the available custom actions on this resource like SubmitTestEvent or any Oem Action.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Oem.
NOTE
Health and HealthRollup is not applicable.</td></tr>
<tr><td>Subscriptions (N)</td><td>Object</td><td>True</td><td>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.</td></tr>
<tr><td>ServerSentEventUri</td><td>String</td><td>True</td><td>Indicates the link to a URI for receiving Server-Sent Event respresentation for the events.</td></tr>
<tr><td>SSEFilterPropertiesSupported</td><td>Object</td><td>True</td><td>Set of properties that are supported in the $filter query parameter for the ServerSentEventUri.<table><tr><th>SSEFilterProperties</th><th>Supported</th></tr><tr><td>EventFormatType</td><td>true</td></tr><tr><td>MessageId</td><td>true</td></tr><tr><td>MetricReportDefinition</td><td>false</td></tr><tr><td>OriginResource</td><td>true</td></tr><tr><td>RegistryPrefix</td><td>true</td></tr><tr><td>ResourceType</td><td>true</td></tr><tr><td>SubordinateResources</td><td>false</td></tr></table></td></tr>
<tr><td>SMTP</td><td>Object</td><td>True</td><td>Set of properties contain parameters for the SMTP (Simple Mail Transfer Protocol) service.</td></tr>
</table>

			Name	Type	Read Only	Description
			Authentication	String	false	Property will Contain Authentication methods for SMTP service. ‘’Plain’’ and ‘’None’’ are available as options.None is no Authentication and Plain is Basic Authentication with SMTP Server. Setting this to ‘’None’’ does NOT Delete ‘’Username’’ and ‘’Password’’ parameters.
			ConnectionProtocol	String	false	Property Contains Connection Protocols for SMTP service. ‘’None’’, ‘’StartTLS’’, and ‘’TLS_SSL’’ are possible options. None is for sending e-mail over non secure port. TLS_SSL is for sending e-mail over Secure Port and StartTLS is for sending e-mail over TLS.
			FromAddress	String	false	Property Contains The Sender’s Address for the SMTP service. This can be a valid email address. If FromAddress is set in Web, the FromAddress input will be set for both Primary and Secondary. If Primary OR Secondary FromAddress is set in Redfish the Web entry will be updated. If Primary AND Secondary are set in Redfish, Primary FromAddress will be set to Web.
			Password	String	false	Property Contains the password if

						"Authentication" property in SMTP service is "Plain". This will be displayed as "null" for security reasons, but the values will be saved in the backend. When Authentication is set to "None", the value will still exist in backend.
			Port	Number	false	Property contains the Destination Port number for the SMTP service. Secureport and Smtpport, available in the IPMI/Web counterpart, are hidden following DMTF spec. By Default Secureport is 465 and Smtpport is 25. If a PATCH command is set with "ConnectionProtocol" as "TLS_SSL" then the SecurePort is changed when "Port" parameter is changed. If the PATCH is called when "ConnectionProtocol" is "StartTLS" or "None", the "Port" parameter changes the Smtpport value. The "Port" parameter has a value range of 0 to 65535, except for ports 0, 20, 21, 22, 23, 80, 161, 443, and 546.
			ServerAddress	String	false	Property Contains the Server Address for the SMTP service. This can be in IPv4 or IPv6 format.
			ServiceEnabled	Boolean	false	Property controls wheter or not the SMTP service is enabled or disabled.
			Username	String	false	Property contains the username if

						"Authentication" property in SMTP service is "Plain". When Authentication is set to "None", the value will still exist in backend.

PATCH

Request

```
PATCH https://{{ip}}/redfish/v1/EventService
Content-Type: application/json
```

Request Body

Please refer to the properties that are patchable in Table Event Service Property 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
}
```

Example Request Body for SMTP :-

```
{
   "SMTP" : {
      "Username" : "TestUser" ,
      "Password" : "admin234" ,
      "ServiceEnabled" : true,
      "ServerAddress" : "172.31.1.23" ,
      "Port" : 25,
      "FromAddress" : "testuser@test.com",
      "Authentication" : "Plain",
      "ConnectionProtocol" : "None"
   }
}
```

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section "Redfish Error Response" and "Status Codes".

POST

SubmitTestEvent

SubmitTestEvent Action can be test with below any one of the Request body options,

1. EventId, EventTimeStamp, OriginOfCondition, MessageId, MessageArgs and Severity.
2. MessageId

EventId Id in String format
EventTimeStamp Should not be past or more than 2 minutes of BMC date time. BMC date time available in /redfish/v1/Managers/{{Managers_Instance}} uri.
OriginOfCondition any valid Redfish URI.

MessageId, MessageArgs and Severity - Can get these values from Registries URI, https://{{ip}}/redfish/v1/Registries/{{Registry_instance.json}}

Request

```
POST https://{{ip}}/redfish/v1/EventService/Actions/EventService.SubmitTestEvent
Content-Type:application/json
```

1. EventId, EventTimeStamp, OriginOfCondition, MessageId, MessageArgs and Severity

Examples:
Base:
MessageId : Base.1.12.PropertyValueNotInList
MessageArgs : ["Lit" , "IndicatorLED"]
Severity : "Warning"

POST Request Body:

```
{
   "EventTimestamp" : "2019-09-20T23:04:09+02:00" ,
   "EventId" : "1" ,
   "OriginOfCondition" : "/redfish/v1/Chassis/Self" ,
   "MessageId" : "Base.1.12.PropertyValueNotInList" ,
   "MessageArgs" :[ "Lit" , "IndicatorLED" ],
   ''Severity'' : ''Warning''
}
```

Security:
MessageId : Security.1.0.AccessDenied
MessageArgs : ["Test"]
Severity : "Critical"

POST Request Body:

```
{
   "EventTimestamp" : "2019-09-20T23:04:09+02:00" ,
   "EventId" : "2" ,
   "OriginOfCondition" : "/redfish/v1/Chassis/Self" ,
   "MessageId" : "Security.1.0.AccessDenied" ,
   "MessageArgs" :[ "Test" ],
   "Severity" : "Critical"
}
```

2. MessageId
Examples:
EventLog:
MessageId : EventLog.1.0.ResourceAdded

POST Request Body:

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

IPMI:
MessageId : IPMI.1.0.CommandSpecific

POST Request Body:

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

HttpStatus:
MessageId : HttpStatus.1.0.MethodNotAllowed

POST Request Body:

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

SyncAgent:
MessageId : SyncAgent.1.0.AddressOrigin

POST Request Body:

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

Task:
MessageId : Task.1.0.New
POST Request Body:

```
{
   "MessageId" : "Task.1.0.New"
}
```

Response

The response status is 202 Accepted with the created Task Instance as the response body. For Error Responses refer Section "Redfish Error Response" and Section "Stause Codes". Sample Response is as given below:

```
{
   "@odata.context" : "/redfish/v1/$metadata#Task.Task" ,
   "@odata.id" : "/redfish/v1/TaskService/Tasks/7" ,
   "@odata.type" : "#Task.v1_4_2.Task" ,
   "Description" : "Task for EventService SubmitTestEvent Action" ,
   "Id" : "7" ,
   "Name" : "EventService SubmitTestEvent Action" ,
   "TaskState" : "New" ,
   "TaskMonitor": "/redfish/v1/TaskService/TaskMonitors/1",
   "TaskStatus" : "OK"
}
```

NOTE
There is known limitation that Redfish API SubmitTestEvent does not support SMTP protocol and SNMPTrap SubscriptionType.

3.10.2 Event Subscription Collection

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

GET

Request

```
https://{{ip}}/redfish/v1/EventService/Subscriptions
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

POST

Request

```
https://{{ip}}/redfish/v1/EventService/Subscriptions
Content-Type: application/json
```

Examples:
1. With Event Format Type, Registry Prefixes and Resource Types:
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",
   "OriginResources" :[
        { "@odata.id" : "/redfish/v1/AccountService" }
   ]
}
```

Response Body:

```
{
   "@odata.context" : "/redfish/v1/$metadata#EventDestination.EventDestination",
   "@odata.etag" : "\"1583725738\"",
   "@odata.id" : "/redfish/v1/EventService/Subscriptions/1",
   "@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.id" : "/redfish/v1/AccountService" }
   ]
   "OriginResources@odata.count" : 1,
```

```
    "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) Registry Prefixes & 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/2",
    "@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",
    "Protocol" : "Redfish",
```

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

3. With SubscriptionType As "SNMPTrap":
Traps are used when the device needs to alert the Network Management software of an event without being polled. Traps ensure that the NMS gets the information if a certain event occurs on the device that needs to be recorded without being polled by the NMS first.
Syntax of Destination Property:

SNMPv3 : "Destination" : "snmp:<**snmp_bmc_username**>//<destination_addr>" ,
SNMPv1/ SNMPv2c : "Destination" : "snmp://<destination_addr>" ,

NOTE
For SNMPv3, the username with snmp access should be given in the destination.
In the above example, the "snmp_bmc_username" is a user with SNMP access, from whom the SNMPTrap will be triggered.
The destination_addr" is the destination IP, to which the Trap will be sent.
For "SNMPv1/ SNMPv2c", the username should not be passed in the Destination.
In the existing design, though the value of DeliveryRetryPolicy is listed in the response, the "DeliveryRetryPolicy" support is not available for SNMPTrap SubscriptionType.
DeliveryRetryPolicy functionalities will not be working of SNMPTrap SubscriptionType. So ResumeSubscription URL action will not be listed for SuspendRetries.

i) Request body of SNMPTrap version-1:

```
{
   "Context" : "Event_Test",
   "Destination" : "snmp://10.0.125.169",
   "EventFormatType" : "Event",
   "RegistryPrefixes" :[ "EventLog", "SyncAgent", "Security", "IPMI", "HttpStatus", "Base" ],
    "ResourceTypes" :[ "Systems", "Chassis", "AccountService", "TelemetryService", "Managers",
    "EventService" ],
   "Protocol" : "SNMPv1",
   "SubscriptionType" : "SNMPTrap"
}
```

Response Body of SNMPTrap version-1:

```
{
   "@odata.context" : "/redfish/v1/$metadata#EventDestination.EventDestination",
   "@odata.etag" : "\"1616755330\"",
   "@odata.id" : "/redfish/v1/EventService/Subscriptions/2",
   "@odata.type" : "#EventDestination.v1_7_0.EventDestination",
   "Context" : "Event_Test",
   "DeliveryRetryPolicy" : "TerminateAfterRetries",
   "Description" : "Event Subscription",
   "Destination" : "snmp://10.0.125.169",
   "EventFormatType" : "Event",
   "Id" : 2,
   "Name" : "Subscription 2",
   "Protocol" : "SNMPv1",
   "RegistryPrefixes" : [
      "IPMI",
      "SyncAgent",
```

```
        "EventLog",
        "Base",
        "Security",
        "HttpStatus"
    ],
    "ResourceTypes" : [
        "Systems",
        "TelemetryService",
        "Chassis",
        "EventService",
        "AccountService",
        "Managers"
    ],
    "Status" : {
        "Health" : "OK",
        "HealthRollup" : "OK",
        "State" : "Enabled"
    },
    "SubordinateResources" : false,
    "SubscriptionType" : "SNMPTrap"
}
```


ii) Request body of SNMPTrap version-2:


```
{
    "Context" : "Event_Test",
    "Destination" : "snmp://10.0.125.169",
    "EventFormatType" : "Event",
    "RegistryPrefixes" :[ "EventLog", "SyncAgent", "Security", "IPMI", "HttpStatus", "Base" ],
     "ResourceTypes" :[ "Systems", "Chassis", "AccountService", "TelemetryService", "Managers",
     "EventService" ],
    "Protocol" : "SNMPv2c",
    "SubscriptionType" : "SNMPTrap"
}
```


Response Body of SNMPTrap version-2:


```
{
  "@odata.context" : "/redfish/v1/$metadata#EventDestination.EventDestination",
  "@odata.etag" : "\"1616755368\"",
  "@odata.id" : "/redfish/v1/EventService/Subscription3",
  "@odata.type" : "#EventDestination.v1_7_0.EventDestination",
  "Context" : "Event_Test",
  "DeliveryRetryPolicy" : "TerminateAfterRetries",
  "Description" : "Event Subscription",
  "Destination" : "snmp://10.0.125.169",
  "EventFormatType" : "Event",
  "Id" : 3,
  "Name" : "Subscription 3",
  "Protocol" : "SNMPv2c",
  "RegistryPrefixes" : [
      "IPMI",
      "SyncAgent",
      "EventLog",
      "Base",
      "Security",
      "HttpStatus"
  ],
   "ResourceTypes" : [
      "Systems",
```

```
        "TelemetryService",
        "Chassis",
        "EventService",
        "AccountService",
        "Managers"
    ],
    "Status": {
        "Health": "OK",
        "HealthRollup": "OK",
        "State": "Enabled"
    },
    "SubordinateResources": false,
    "SubscriptionType": "SNMPTrap"
}
```

iii) Request body of SNMPTrap version-3:

```
{
    "Context": "Event_Test",
    "Destination": "snmp://10.0.125.169",
    "EventFormatType": "Event",
    "RegistryPrefixes":[ "EventLog", "SyncAgent", "Security", "IPMI", "HttpStatus", "Base" ],
    "ResourceTypes":[ "Systems", "Chassis", "AccountService", "TelemetryService", "Managers",
    "EventService" ],
    "Protocol": "SNMPv3",
    "SubscriptionType": "SNMPTrap"
}
```

Response Body of SNMPTrap version-3:

```
{
  "@odata.context": "/redfish/v1/$metadata#EventDestination.EventDestination",
  "@odata.etag": "\"1616755368\"",
  "@odata.id": "/redfish/v1/EventService/Subscriptions/4",
  "@odata.type": "#EventDestination.v1_7_0.EventDestination",
  "Context": "Event_Test",
  "DeliveryRetryPolicy": "TerminateAfterRetries",
  "Description": "Event Subscription",
  "Destination": "snmp://10.0.125.169",
  "EventFormatType": "Event",
  "Id": 4,
  "Name": "Subscription 4",
  "Protocol": "SNMPv3c",
  "RegistryPrefixes": [
      "IPMI",
      "SyncAgent",
      "EventLog",
      "Base",
      "Security",
      "HttpStatus"
  ],
  "ResourceTypes": [
      "Systems",
      "TelemetryService",
      "Chassis",
      "EventService",
      "AccountService",
      "Managers"
  ],
  "Status": {
```

```
        "Health" : "OK" ,
        "HealthRollup" : "OK" ,
        "State" : "Enabled"
    },
    "SubordinateResources" : false,
    "SubscriptionType" : "SNMPTrap"
}
```

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 "Redfish Error Response" and Section "Status Codes".

3.10.3 Event Subscription

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

GET

Request

```
GET https://{{ip}}/redfish/v1/EventService/Subscriptions/{{Subscriptions_instance}}
Content-Type: application/json
```

Response

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

Table 128 Event Subscription Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
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.
SubscriptionType	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. **NOTE** *When the value is "SNMPTrap", then traps will be sent to destination address on an redfish event.*

<table>
<tr><td>Protocol</td><td>String</td><td>True</td><td>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.
NOTE
The value ‘‘Redfish’’ shall be used to indicate that the event type shall adhere to that defined in the Redfish specification. The value ‘‘SMTP’’ means the events will be sent as e-mail to the configured SMTP Server:
The value ‘‘SNMPv3’’, ‘‘SNMPv1’’ or ‘‘SNMPv2c’’ specifies the SNMPTrap version. The allowable values are ‘‘Redfish’’, ‘‘SMTP’’, ‘‘SNMPv3’’, ‘‘SNMPv2c’’, ‘‘SNMPv1’’.</td></tr>
<tr><td>MessageIds</td><td>Array</td><td>True</td><td>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.</td></tr>
<tr><td>OriginResources</td><td>Array</td><td>True</td><td>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.
NOTE
This Property will be present only mentioned during Subscription creation.</td></tr>
<tr><td>OriginResources@odata.count</td><td>Number</td><td>True</td><td>The number of items in a collection.
NOTE
This Property will be present only mentioned during Subscription creation.</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td>This object will contain the actions for this resource under Oem property if any.</td></tr>
<tr><td>SubordinateResources</td><td>Boolean</td><td>True</td><td>This property specifying OriginResources when set to true.
NOTE
Default value is false.</td></tr>
<tr><td>EventFormatType</td><td>String</td><td>True</td><td>This property shall contain the types of message that willl be sent to the Event destination.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>MetricReport</td><td>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.</td></tr>
<tr><td>Event</td><td>The Subscription destination will receive JSON bodies as Event format for all other types of Events.</td></tr>
</table></td></tr>
<tr><td>RegistryPrefixes</td><td>Array</td><td>True</td><td>A list of Prefixes for the Message Registries that contain the MessageIds.</td></tr>
</table>

<table>
<tr><td>ResourceTypes</td><td>Array</td><td>True</td><td>A list of Resource type values that corresponds to the OriginOfCondition.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Oem.
NOTE
State will be changed to Dissabled and Health and HealthRollup to Critical when the subscription get’s Suspended.</td></tr>
<tr><td>MetricReportDefinitions</td><td>Array</td><td>True</td><td>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.</td></tr>
<tr><td>DeliveryRetryPolicy</td><td>String</td><td>False</td><td>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.
NOTE
This property will be available in the response even though this support is not available for SNMPTrap Subscription Type, this property only support if Subscription Type is ”RedfishEvent”
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>RetryForever</td><td>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.</td></tr>
<tr><td>SuspendRetries</td><td>The subscription is suspended after the maximum number of retries is reached.</td></tr>
<tr><td>TerminateAfter Retries</td><td>The subscription is terminated after the maximum number of retries is reached.The subscription will get deleted after the retry attempts.</td></tr>
</table>
</td></tr>
</table>

PATCH

Request

```
PATCH 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 Requset Body:-

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

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

DELETE

Request

```
DELETE    https://{{ip}}/redfish/v1/EventService/Subscriptions/{{Subscriptions_instance}}
Content-Type: application/json
```

Response

The response status is 204 and no response body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

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.

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.

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.11 Task Service API

3.11.1 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.

GET

Request

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

Content-Type: application/json

Response

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

Table 129 Task Service Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Resource Complex Types under Section Resource. **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 Resource
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
Service Enabled(C)	Boolean	True	This indicates whether this service is enabled.
Status	Object	True	Refer Section Resource for Resource.Oem. **NOTE** *HealthRollup is not applicable.*
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.

3.11.2 Task Collection

It displays the collection of links to each task.

GET

Request

```
https://{{ip}}/redfish/v1/TaskService/Tasks
Content-Type: application/jsonAccounts
```

Response

Please refer Section Collection for the JSON response properties.

3.11.3 Task

This URI represents the details of the task created. Check the response for its attributes.

GET

Request

```
https://{{ip}}/redfish/v1/TaskService/Tasks/{{task_instance}}
Content-Type: application/json
```

Response

The Response Status Code will be 200 OK, irrespective of the Task State and the Response Body of the request will be in JSON format. The properties of the Response Body are mentioned in the following table:

Table 130 Task Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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

			Resource	
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.
			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 "Redfish Error Response" and Section "Status Codes".
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	Interger	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.*	
TaskMonitor	String	True	This property shall contain a URI to Task Monitor for the corresponding task as defined in the Redfish Specification.	

Table 131 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.

DELETE

Request

```
DELETE    https://{{ip}}/redfish/v1/TaskService/Tasks/{{task_instance}}
Content-Type: application/json
```

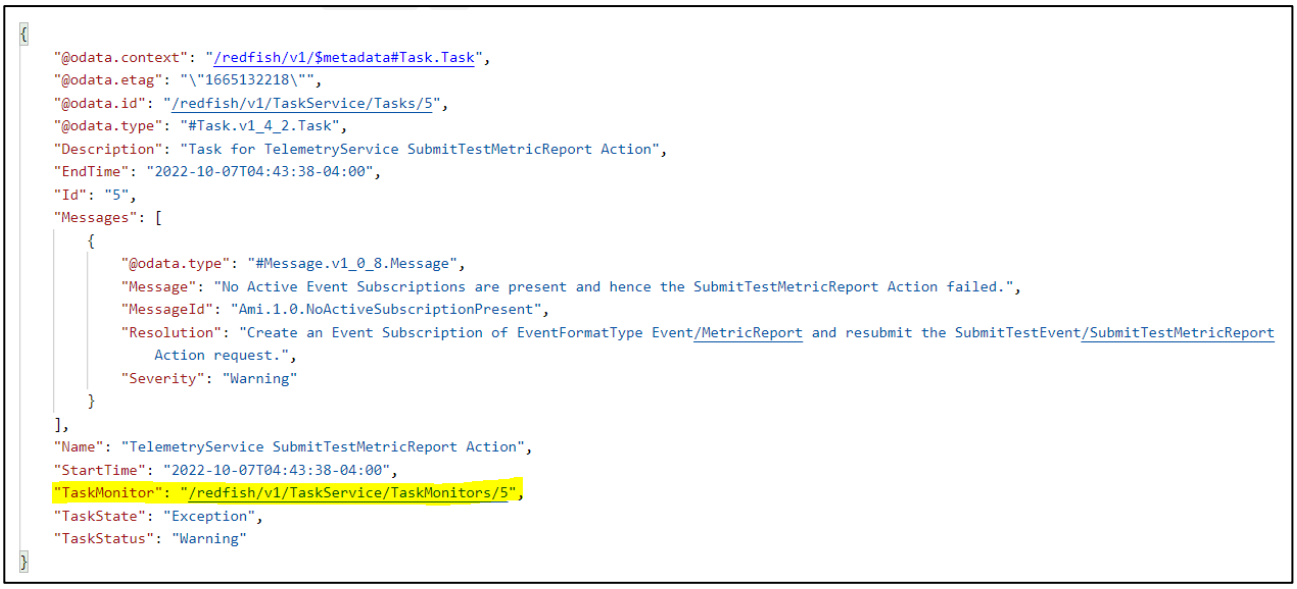
Response

The response status is 204 and no response body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.11.4 Task Monitor

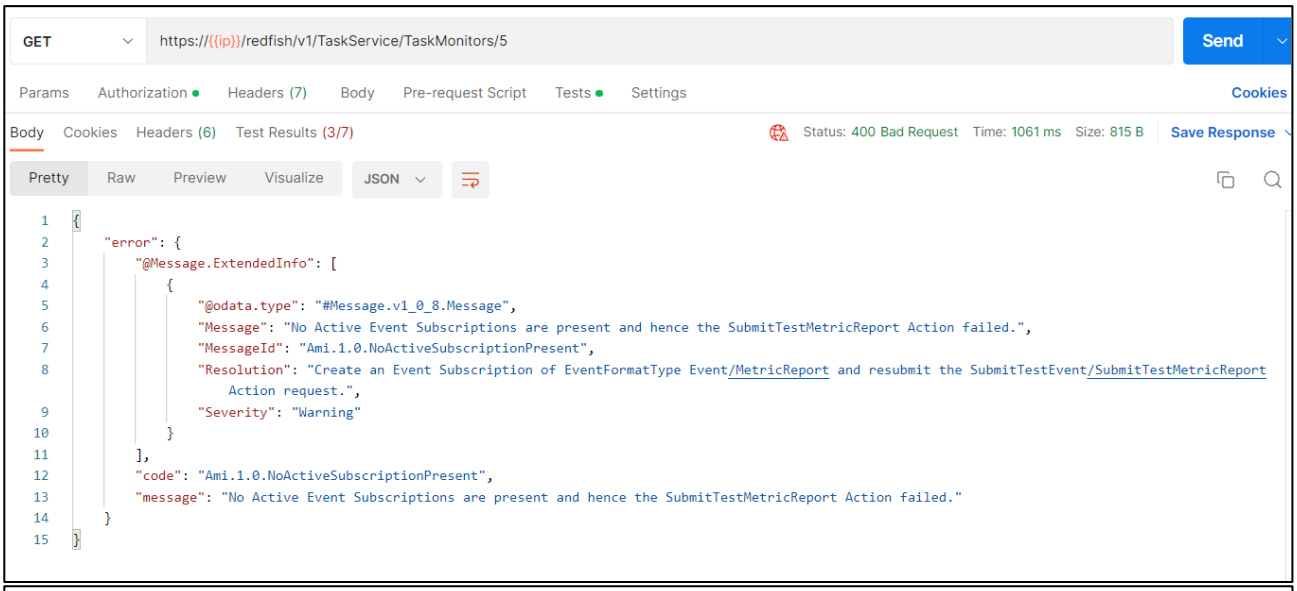
Services that support asynchronous operations implement the Task Service and Task resources. The Task Service resource describes the service that handles task. It contains a resource collection of zero or more Task resources. The Task resource describes a long-running operation that is spawned when a request takes longer than a few seconds, such as when a service is instantiated. The Task schema defines task structure, including the start time, end time, task state, task status, and zero or more task-associated messages. Each task has several possible states. The Task schema defines the exact states and their semantics.

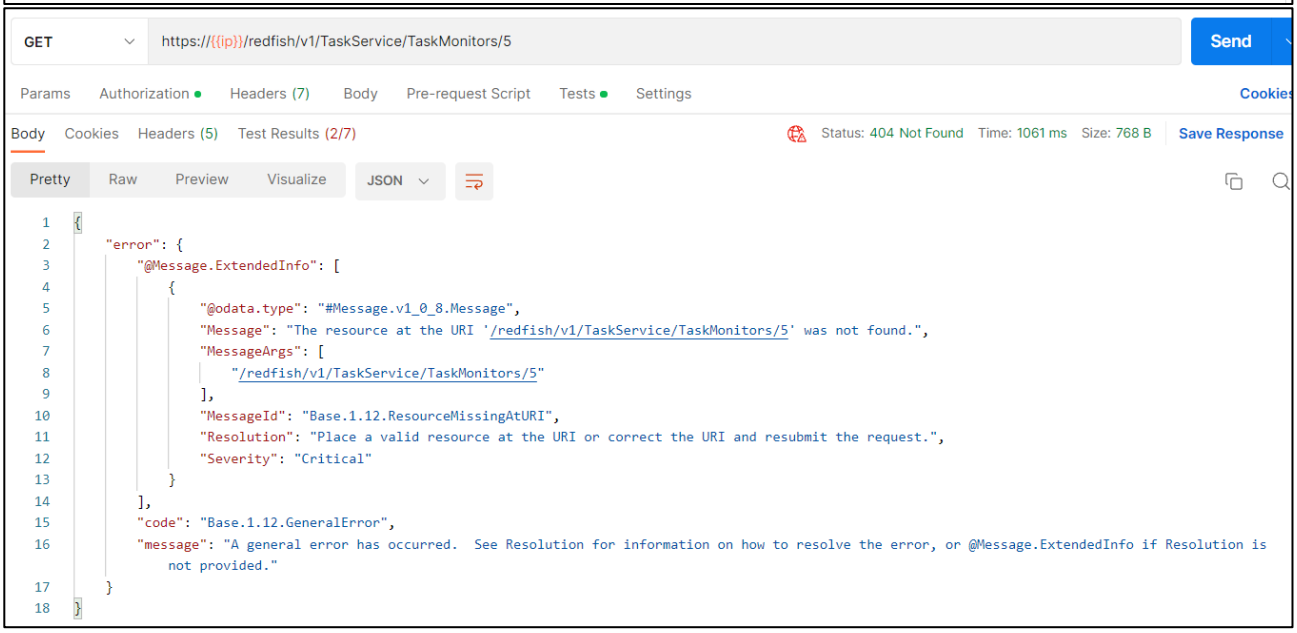
- The Task Monitor is an opaque service-generated URI that the client who initiates the request can use. It is complaint with the Task Instance Schema.
- When a client issues a request for a long-running operation, the service returns the HTTP 202 Accepted status code and a Location header that contains the URI of the Task Monitor and, optionally, the Retry-After header that defines the amount of time that the client should wait before querying the status of the operation.
  For e.g.,
  https://{{ip}}/redfish/v1/TaskService/TaskMonitors/{{Task_Monitor_Instance}}
- The Task Monitor Instance will internally create a Task Instance and both the instances will have the same Identification Index i.e., Id attribute will have the same value.
  For e.g., https://{{ip}}/redfish/v1/TaskService/Tasks/1
  https://{{ip}}/redfish/v1/TaskService/TaskMonitors/1
- To query the status of an operation and determine when the operation has been completed and whether it succeeded, the client can either perform a GET request on the Task Monitor Instance URI or the Task Instance URI.
- GET requests to either the Task Monitor Instance, or the Task Instance shall return the status of the operation without blocking. The GET response of the Task Monitor Instance URI is going to be dependent on the state of the requested operation, as well as the type of operation itself.
- When the client queries the Task Monitor URI, the service will continue to return the HTTP 202 Accepted status code until the operation is in process. The 202 Accepted response body should contain an instance of the Task resource that describes the state of the task.
- When the client queries the Task Instance URI, the service will return the HTTP 200 Accepted status code and this resource describes the current state of the task. The response will contain an attribute named ‘‘TaskMonitor’’ which will list the corresponding Task Monitor Instance as shown below.




```
{
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "@odata.etag": "\"1665132218\"",
    "@odata.id": "/redfish/v1/TaskService/Tasks/5",
    "@odata.type": "#Task.v1_4_2.Task",
    "Description": "Task for TelemetryService SubmitTestMetricReport Action",
    "EndTime": "2022-10-07T04:43:38-04:00",
    "Id": "5",
    "Messages": [
        {
            "@odata.type": "#Message.v1_0_8.Message",
            "Message": "No Active Event Subscriptions are present and hence the SubmitTestMetricReport Action failed.",
            "MessageId": "Ami.1.0.NoActiveSubscriptionPresent",
            "Resolution": "Create an Event Subscription of EventFormatType Event/MetricReport and resubmit the SubmitTestEvent/SubmitTestMetricReport
                Action request.",
            "Severity": "Warning"
        }
    ],
    "Name": "TelemetryService SubmitTestMetricReport Action",
    "StartTime": "2022-10-07T04:43:38-04:00",
    "TaskMonitor": "/redfish/v1/TaskService/TaskMonitors/5",
    "TaskState": "Exception",
    "TaskStatus": "Warning"
}
```

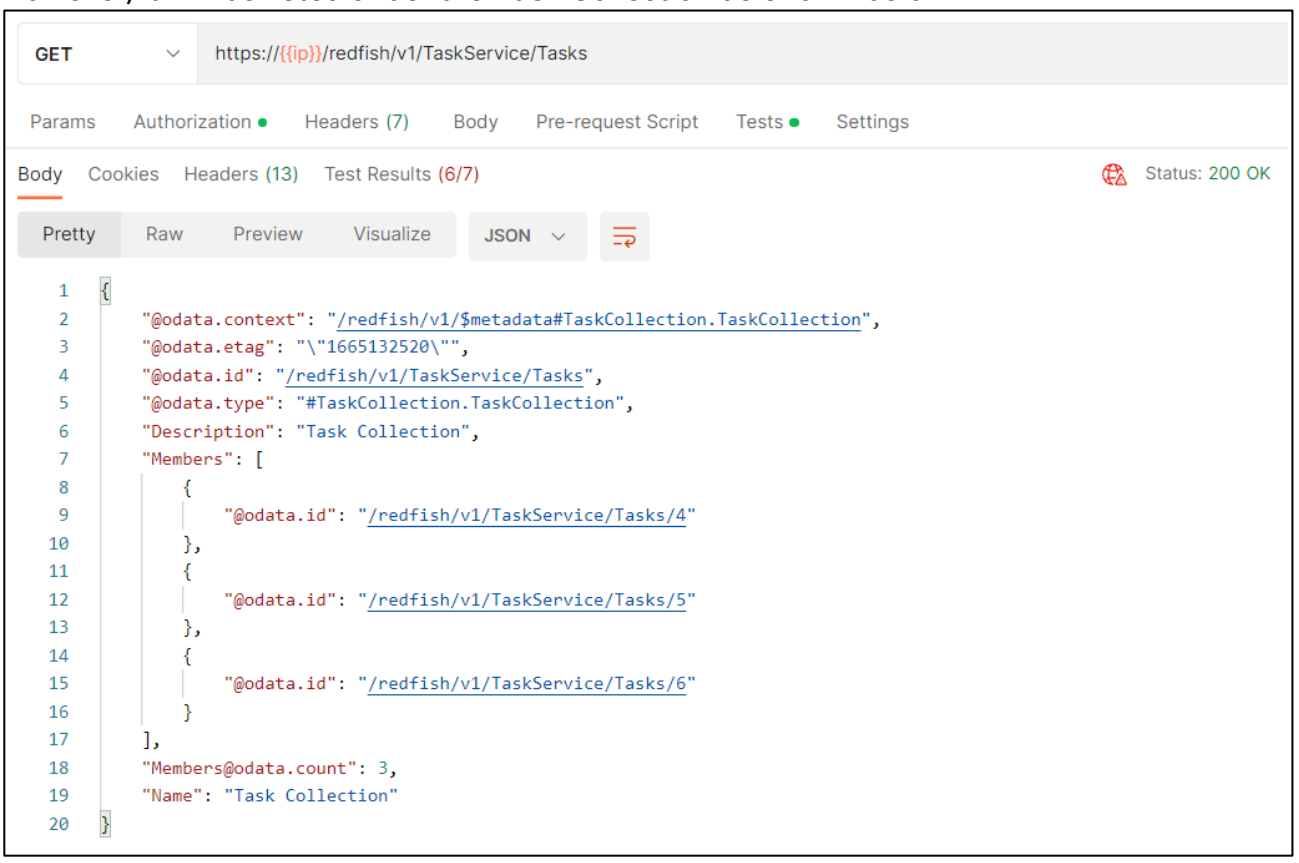

- If a service supports cancellation of a task, it shall have DELETE in the Allow header for the Task Monitor Instance URI.
- To cancel the operation, the client may either perform a DELETE on the Task Monitor Instance URI or the Task Instance URI. In case DELETE is possible, both the Task Monitor Instance and the corresponding Task Instance will be deleted.
- If the Task has already started running, then DELETE may fail stating the corresponding reasons, like the implementation for the Task Instance Resource.
- A subsequent GET request on the Task Monitor Instance URI or the Task Instance URI returns the HTTP 404 Not Found status code.
- After the operation has been completed, the task monitor shall return the appropriate HTTP status code, such as but not limited to 200 OK for most operations or 204 No Content or 201 Created for POST to create a resource in the case of success or 400 Bad Request in the case of failure with the appropriate error response body.
- The headers and response body will be that of the initial operation, as if it had completed synchronously as explained in Section 3.11.4.1. For e.g., if the original operation was a PATCH on a Computer System resource, the response body would contain the updated Computer System resource. Another example is if the original operation was the GenerateCSR action in the CertificateService, the response body in this case would contain the action response body for GenerateCSR.
- Once the operation has been completed, and the client issues a GET call to the Task Monitor Instance, the client will be able to see the response of the Task Monitor Instance and the Task Monitor Instance will then be deleted.





- As a result of this, the Task Monitor attribute will not be listed under the corresponding Task Instance Resource.

However, it will be listed under the Task Collection as shown below:



- The Task Monitor is not a resource in the model, much like other special URIs like action URIs, binary data referenced by Assembly, and the multipart update URI. The details are defined in the specification since the Task Monitor doesn't follow typical CRUD semantics that map to all other resources.

3.11.4.1 Task Monitor based Redfish/OEM Actions

All Redfish/OEM Actions which may require more time for execution needs to be performed asynchronously so that the other Redfish Requests do not have to deal with a waiting period. To achieve asynchronous behavior, these actions are performed with the help of the Task Service Daemon, which will execute the Tasks in the background. These actions need to pass through the Task Monitor, which helps in providing a better sort-ofinterface as compared to the Task Instance. The below mentioned Redfish/OEM Actions are Task Monitor based.
The response codes mentioned against each of the below Redfish/OEM Action URL denotes the HTTP Status Code for the Task Monitor URI once the corresponding Task has finished execution or got terminated due to some error. Until the corresponding Task has not completed, the Task Monitor URI will always return a 202 Accepted Status Code. The 202 Accepted response body will contain an instance of the Task resource that describes the state of the task.

3.11.4.1.1 Reset Actions

- POST https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Actions/Chassis.Reset -

204 No Content / 400 Bad Request with Error Response
- POST
https://{{ip}}/redfish/v1/Managers/{{managers_instance}}/Actions/Manager.Reset -
204 No Content / 400 Bad Request with Error Response
- POST
https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Actions/ComputerSystem.Reset - 204 No Content / 400 Bad Request with Error Response

3.11.4.1.2 Log Service Actions

- POST
https://{{ip}}/redfish/v1/Managers/{{managers_instance}}/LogServices/SEL/Actions/LogService.ClearLog - 204 No Content / 400 Bad Request with Error Response
- POST
https://{{ip}}/redfish/v1/Managers/{{managers_instance}}/LogServices/AuditLog/Actions/LogService.ClearLog - 204 No Content / 400 Bad Request with Error Response
- POST
https://{{ip}}/redfish/v1/Managers/{{managers_instance}}/LogServices/EventLog/Actions/LogService.ClearLog - 204 No Content / 400 Bad Request with Error Response
- POST
https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/LogServices/Logs/Actions/LogService.ClearLog - 204 No Content / 400 Bad Request with Error Response
- POST
https://{{ip}}/redfish/v1/Systems/{{systems_instance}}/LogServices/BIOS/Actions/LogService.ClearLog - 204 No Content / 400 Bad Request with Error Response
- POST
https://{{ip}}/redfish/v1/TelemetryService/LogService/Actions/LogService.ClearLog -
204 No Content / 400 Bad Request with Error Response

3.11.4.1.3 Upadate Service Actions

- POST https://{{ip}}/redfish/v1/UpdateService/Actions/SimpleUpdate - 200 OK / 400 Bad Request with Error Response
GET https://{{ip}}/redfish/v1/TaskService/TaskMonitors/{{Task_Monitor_Instance}}
In the case of 200 OK, the response body would be as shown below:


```
{
   "error": {
         "@Message.ExtendedInfo": [
           {
              "@odata.type": "#Message.v1_0_8.Message",
              "Message": "Task /redfish/v1/UpdateService/Actions/SimpleUpdate has completed.",
              "MessageArgs": [
                    "/redfish/v1/UpdateService/Actions/SimpleUpdate"
              ],
              "MessageId": "Task.1.0.Completed",
              "Resolution": "None",
              "Severity": "OK"
           },
           {
```

```
                "@odata.type": "#Message.v1_0_8.Message",
                "Message": "Action /redfish/v1/UpdateService/Actions/SimpleUpdate firmware update is
completed.",
                "MessageArgs": [
                   "/redfish/v1/UpdateService/Actions/SimpleUpdate"
                ],
                "MessageId": "UpdateService.1.0.FirmwareUpdateCompleted",
                "Resolution": "None",
                "Severity": "OK"
             }
          ],
          "code": "Base.1.12.GeneralError",
          "message": "A general error has occurred. See Resolution for information on how to resolve
the error, or @Message.ExtendedInfo if Resolution is not provided."
    }
}
```


- POST https://{{ip}}/redfish/v1/UpdateService/upload - 200 OK / 400 Bad Request with Error Response

GET https://{{ip}}/redfish/v1/TaskService/TaskMonitors/{{Task_Monitor_Instance}}

In the case of 200 OK, the response body would be as shown below:


```
{
    "error": {
       "@Message.ExtendedInfo": [
          {
             "@odata.type": "#Message.v1_0_8.Message",
             "Message": "Task /redfish/v1/UpdateService/upload has completed.",
             "MessageArgs": [
                "/redfish/v1/UpdateService/upload"
             ],
             "MessageId": "Task.1.0.Completed",
             "Resolution": "None",
             "Severity": "OK"
          },
          {
             "@odata.type": "#Message.v1_0_8.Message",
             "Message": "Action /redfish/v1/UpdateService/upload firmware update is completed.",
             "MessageArgs": [
                "/redfish/v1/UpdateService/upload"
             ],
             "MessageId": "UpdateService.1.0.FirmwareUpdateCompleted",
             "Resolution": "None",
             "Severity": "OK"
          }
       ],
       "code": "Base.1.12.GeneralError",
       "message": "A general error has occurred. See Resolution for information on how to resolve the
error, or @Message.ExtendedInfo if Resolution is not provided."
    }
}
```

3.11.4.1.4 Event Action - SubmitTestEvent

- POST https://{{ip}}/redfish/v1/EventService/Actions/EventService.SubmitTestEvent - 204 No Content / 400 Bad Request with Error Response

3.11.4.1.5 Telemetry Action - SubmitTestMetricReport

- POST https://{{ip}}/redfish/v1/TelemetryService/Actions/TelemetryService.SubmitTestMetricReport - 204 No Content / 400 Bad Request with Error Response

3.11.4.1.6 Ethernet Interface Instance Patch

- PATCH https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/EthernetInterfaces/{{manager_ethifc_instance}} - 200 OK / 400 Bad Request with Error Response
GET https://{{ip}}/redfish/v1/TaskService/TaskMonitors/{{Task_Monitor_Instance}}
In the case of 200 OK, the response body would contain the updated Ethernet Interface Instance resource.

3.11.4.1.7 Virtual Media Action

- POST https://{{ip}}/redfish/v1/Managers/{{managers_instance}}/VirtualMedia/{{CD_instance}}/Actions/VirtualMedia.InsertMedia - 200 OK / 400 Bad Request with Error Response
GET https://{{ip}}/redfish/v1/TaskService/TaskMonitors/{{Task_Monitor_Instance}}
In the case of 200 OK, the response body would be as shown below:


```
{
   "error": {
      "@Message.ExtendedInfo": [
         {
            "@odata.type": "#Message.v1_0_8.Message",
            "Message": "InsertMedia action has been initiated successfully. Please allow up to 4-5 secs
and verify the value of Inserted property in /redfish/v1/Managers/Self/VirtualMedia/CD1 instance",
            "MessageArgs": [
               "InsertMedia",
               "Inserted",
               "/redfish/v1/Managers/Self/VirtualMedia/CD1"
            ],
            "MessageId": "Ami.1.0.DelayInActionCompletion",
            "Resolution": "Check the property value update after 4-5 seconds",
            "Severity": "OK"
         }
      ],
      "code": "Ami.1.0.DelayInActionCompletion",
      "message": "InsertMedia action has been initiated successfully. Please allow up to 4-5 secs and
verify the value of Inserted property in /redfish/v1/Managers/Self/VirtualMedia/CD1 instance"
   }
}
```

3.11.4.1.8 Account Service Active Directory and LDAP Patch

- PATCH https://{{ip}}/redfish/v1/AccountService - 200 OK / 400 Bad Request with Error Response
GET https://{{ip}}/redfish/v1/TaskService/TaskMonitors/{{Task_Monitor_Instance}}
In the case of 200 OK, the response body would contain the updated Account Service resource.

3.11.4.1.9 Managers Network Protocol Patch

- PATCH https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/NetworkProtocol - 202 OK / 400 Bad Request with Error Response
GET https://{{ip}}/redfish/v1/TaskService/TaskMonitors/{{Task_Monitor_Instance}}
In the case of 200 OK, the response body would contain the updated Network Protocol resource.

3.11.4.1.10 Systems Instance IndicatorLED, PowerRestorePolicy Patch

- PATCH https://{{ip}}/redfish/v1/Systems/{{system_instance}} - 200 OK / 400 Bad Request with Error
Response
GET https://{{ip}}/redfish/v1/TaskService/TaskMonitors/{{Task_Monitor_Instance
In the case of 200 OK, the response body would contain the updated Systems Instance resource.

3.12 JsonSchemas API

3.12.1 JSON Schema file collection

It displays the collection of links to each schema hosted locally for the OEM JSONSchemaFiles.

GET

Request

```
https://{{ip}}/redfish/v1/JsonSchemas
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

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.

GET

Request

```
https://{ip}}/redfish/v1/JsonSchemas/<json_schema_name>
Content-Type: application/json
```

Response

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

Table 132 JSON Schema file Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
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 JSON Schema File Location Property.
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.

Table 133 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.

3.13 Session Service API

3.13.1 Session Collection

It displays the collection of links to each session.

GET

Request

```
https://{{ip}}/redfish/v1/SessionService/Sessions
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

POST [Creating new Session]

Request

```
POST https://{{ip}}/redfish/v1/SessionService/Sessions
Content-Type: application/json
```

Example POST Request:

```
{
   "UserName" : "Administrator" ,
   "Password" : "superuser"
}
```

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 Sectioin "Redfish Error Response" and Section "Status Codes".

3.13.2 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.

GET

Request

```
https://{{ip}}/redfish/v1/SessionService
Content-Type: application/json
```

Response

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

Table 134 Session Service Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
Status	Object	True	Refer Section Resource for Resource.Oem. **NOTE** *HealthRollup is not applicable.*
ServiceEnabled(C)	Boolean	False	This indicates whether this service is enabled. Default value will be **true**
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.

PATCH

Request

```
PATCH https://{{ip}}/redfish/v1/SessionService
Content-Type: application/json
```

Request Body

Please refer to the properties that are patchable in Table 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
}
```

Response

The response status is success with status code as 204. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.13.3 Session

Displays the Session details for the given session.

GET

Request

```
https://{{ip}}/redfish/v1/SessionService/Sessions/{{session_id}}
Content-Type: application/json
```

Response

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

Table 135 Session Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
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 POST/GET Response.*
Actions	Object	True	This object will contain the actions for this resource under Oem property if any.

DELETE

Request

```
DELETE https://{{ip}}/redfish/v1/SessionService/Sessions/{{session_id}}
Content-Type: application/json
```

Response

The response status is 204 and no response body.For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.14 Registries API

3.14.1 Message Registry File Collection

Contains a list of registries supported by the redfish service including AttributeRegistry.

GET

Request

```
https://{{ip}}/redfish/v1/Registries
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.14.2 Message Registry

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.1.12.0.json* represents the Base Registry containing the messages for the redfish server.

GET

Request

```
https://{{ip}}/redfish/v1/Registries/{{Registry_instance.json}}
Content-Type: application/json
```

Response

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

Table 136 Message Registry Property

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource

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.

3.14.3 Attribute Registry

This is the schema definition for Attribute Registries.
For Eg:/redfish/v1/Registries/BiosAttributeRegistryOACMO.1.17.0.json represents the Bios Attribute Registry containing the list of supported attributes and its dependencies.

GET

Request

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

Content-Type: application/json

Response

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

Table 137 Attribute Registry Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource **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 Resource
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.
OwningEntity	String	True	The organization or company that publishes this Attribute Registry.
RegistryVersion	String	True	This property shall contain the version of this Attribute Registry.
RegistryEntries	Object	True	The list of all attributes and metadata for this component.

Name	Type	Read Only	Description
Attributes	ArrayOf Objects	True	An array of attributes and their possible values in the Attribute Registry. Refer Attributes table below for Property details

<table>
<tr><td></td><td></td><td></td><td>Dependencies</td><td>ArrayOfObjects</td><td>True</td><td>An array of dependencies of attributes on this component.
Refer Dependencies table below for Property details</td></tr>
<tr><td></td><td></td><td></td><td>Menus</td><td>ArrayOfObjects</td><td>True</td><td>An array for the attributes menus and their hierarchy in the Attribute Registry.
Refer Menus table below for Property details</td></tr>
<tr><td rowspan="4">SupportedSystems</td><td rowspan="4">ArrayOfObjects</td><td rowspan="4">True</td><td colspan="4">An array of systems that this Attribute Registry supports.</td></tr>
<tr><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>FirmwareVersion</td><td>String</td><td>True</td><td>The version of the component firmware image to which this Attribute Registry applies.</td></tr>
<tr><td>ProductName</td><td>String</td><td>True</td><td>The product name of the computer system to which this Attribute Registry applies.</td></tr>
<tr><td></td><td></td><td></td><td>SystemId</td><td>String</td><td>True</td><td>The ID of the systems to which this Attribute Registry applies.</td></tr>
</table>

Table 138 Property Table of Attributes

Name	Type	Read Only	Description
AttributeName	String	True	The unique name for the attribute.
CurrentValue	String/ Boolean/ Number/ Null	True	The placeholder of the current value for the attribute.
DefaultValue	String/ Boolean/ Number/ Null	True	The default value for the attribute.
DisplayName	String	True	The user-readable display string for the attribute in the defined language.
DisplayOrder	Number	True	The ascending order, as a number, in which this attribute appears relative to other attributes.
GrayOut	Boolean	True	An indication of whether this attribute is grayed out. A grayed-out attribute is not active and is grayed out in user interfaces but the attribute value can be modified.
HelpText	String	True	The help text for the attribute.
Hidden	Boolean	True	An indication of whether this attribute is hidden in user interfaces.
Immutable	Boolean	True	An indication of whether this attribute is immutable. Immutable attributes shall not be modified and typically reflect a hardware state.
IsSystemUniqueProperty	Boolean	True	This property shall indicate whether this attribute is unique.
LowerBound	Number	True	The lower limit for an integer attribute.
MaxLength	Number	True	The maximum character length of a string attribute.
MenuPath	String	True	The path that describes the menu hierarchy of this attribute.
MinLength	Number	True	The minimum character length of the string attribute.
ReadOnly	Boolean	True	An indication of whether this attribute is read-only.
ResetRequired	Boolean	True	An indication of whether a system or device reset is required for this attribute value change to take effect.
ScalarIncrement	Number	True	The amount to increment or decrement an integer attribute each time a user requests a value change. The `0` value indicates a free-form numeric user-input attribute.
Type	String	True	The attribute type. Enum: Description Enumeration: A list of the known possible enumerated values. String: Free-form text in their values. Integer: An integer value.

<table>
<tr><td></td><td></td><td></td><td>Boolean</td><td>A flag with a `true` or `false` value.</td></tr>
<tr><td></td><td></td><td></td><td>Password</td><td>Password values that do not appear as plain text. The value shall be null in responses.</td></tr>
<tr><td>UefiDevicePath</td><td>String</td><td>True</td><td colspan="2">The UEFI device path that qualifies this attribute.</td></tr>
<tr><td>UpperBound</td><td>Numer</td><td>True</td><td colspan="2">The upper limit for an integer attribute.</td></tr>
<tr><td>UefiKeywordName</td><td>String</td><td>True</td><td colspan="2">The UEFI keyword string for this attribute.</td></tr>
<tr><td>UefiNamespaceId</td><td>String</td><td>True</td><td colspan="2">The UEFI namespace ID for the attribute.</td></tr>
<tr><td>ValueExpression</td><td>String</td><td>True</td><td colspan="2">A valid regular expression, according to the Perl regular expression dialect, that validates the attribute value. Applies to only string and integer attributes.</td></tr>
<tr><td>WarningText</td><td>String</td><td>True</td><td colspan="2">The warning text for the attribute.</td></tr>
<tr><td>WriteOnly</td><td>Boolean</td><td>True</td><td colspan="2">An indication of whether this attribute is write-only. A write-only attribute reverts to its initial value after settings are applied.</td></tr>
<tr><td>Value</td><td>ArrayOfObjects</td><td>True</td><td colspan="2">An array of the possible values for enumerated attribute values.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>ValueDisplayName</td><td>String</td><td>True</td><td>A user-readable display string of the value for the attribute in the defined language.</td></tr>
<tr><td>ValueName</td><td>String</td><td>True</td><td>The unique value name for the attribute.</td></tr>
</table></td></tr>
</table>

Table 139 Property Table of Dependencies

Name	Type	Read Only	Description
Dependency	Object	True	The dependency expression for one or more attributes in this Attribute Registry.

Name	Type	Read Only	Description
MapFrom	Object	True	An array of the map-from conditions for a mapping dependency Refer MapFrom Table for Property details.
MapToAttribute	String	True	The AttributeName of the attribute that is affected by this dependency expression.
MapToProperty	String	True	The metadata property for the attribute that contains the mapfrom condition that evaluates this dependency expression.

Enum	Description
CurrentValue	The dependency that affects an attribute's CurrentValue
DefaultValue	The dependency that affects an attribute's DefaultValue.
DisplayName	The dependency that affects an attribute's DisplayName.
DisplayOrder	The dependency that affects an attribute's DisplayOrder
GrayOut	The dependency that affects an attribute's GrayOut state.
HelpText	The dependency that affects an attribute's HelpText.
Immutable	The dependency that affects an attribute's Immutable State
Hidden	The dependency that affects an attribute's Hidden State
Lowerbound	The dependency that affects an attribute's LowerBound
MaxLength	The dependency that affects an attribute's MaxLength
MinLength	The dependency that affects an attribute's

							MinLength
						ReadOnly	The dependency that affects an attribute's ReadOnly State
						ScalarIncrement	The dependency that affects an attribute's ScalarIncrement
						Upper Bound	The dependency that affects an attribute's UpperBound
						ValueExpression	The dependency that affects an attribute's ValueExpression
						Warning Text	The dependency that affects an attribute's WarningText
						WriteOnly	The dependency that affects an attribute's WriteOnly State
			MapToValue	String/ Boolean/ Number/ Null	True	The value that the map-to property changes to if the dependency expression evaluates to `true`.	
Dependency For	String	True	The AttributeName of the attribute whose change triggers the evaluation of this dependency expression.				
Type	String	True	The type of the dependency structure.				
			Enum	Description			
			Map	A simple mapping dependency. If the condition evaluates to `true`, the attribute or state changes to the mapped value.			

Table 140 Property Table of MapFrom

Name	Type	Read Only	Description
MapFromAttribute	String	True	The attribute to use to evaluate this dependency expression.
MapFromCondition	String	True	The condition to use to evaluate this dependency expression. Enum: Description EQU: The logical operation for 'Equal' GEQ: The logical operation for 'Greateer than or Equal' GTR: The logical operation for 'Greater than' LEQ: The logical operation for 'Less than or Equal' LSS: The logical operation for 'Less than' NEQ: The logical operation for 'Not Equal'
MapFromProperty	String	True	The metadata property for the attribute that the MapFromAttribute property specifies to use to evaluate this dependency expression. Enum: Description Current Value: The dependency on an attribute's CurrentValue Default Value: The dependency on an attribute's DefaultValue GrayOut: The dependency on an attribute's GrayOut State Hidden: The dependency on an attribute's Hidden state Lower Bound: The dependency on an attribute's LowerBound Max Length: The dependency on an attribute's MaxLength Min Length: The dependency on an attribute's MinLength Read Only: The dependency on an attribute's ReadOnly state ScalarIncrement: The dependency on an attribute's ScalarIncrement Upper Bound: The dependency on an attribute's UpoerBound Write Only: The dependency on an attribute's WriteOnly state
MapFromValue	String/ Boolean/ Number	True	The value to use to evaluate this dependency expression.
MapTerms	String	True	"The logical term that combines two or more map-from conditions in this dependency expression. For example, `AND` for logical AND, or `OR` for logical OR. Enum: Description AND: The operation used for logical 'AND' of dependency terms. OR: The operation used for logical 'OR' of dependency terms.

Table 141 Property Table for Menus

Name	Type	Read Only	Description
DisplayName	String	True	The user-readable display string of this menu in the defined language.
DisplayOrder	Number	True	The ascending order, as a number, in which this menu appears relative to other menus.
GrayOut	Boolean	True	An indication of whether this menu is grayed out. A grayed-only menu is not accessible in user interfaces.
Hidden	Boolean	True	An indication of whether this menu is hidden in user interfaces.
MenuName	String	True	The unique name string of this menu.
MenuPath	String	True	The path to the menu names that describes this menu hierarchy relative to other menus.
ReadOnly	Boolean	True	An indication of whether this menu is read-only. A readonly menu, its properties, and sub-menus are not accessible in user interfaces.

3.14.4 MessageRegistryFile

This resource shall be used to represent the Schema File locator resource for a Redfish implementation.
For Eg:/redfish/v1/Registries/Base.1.12.0 represents the Base registry file.

GET

Request

```
https://{{ip}}/redfish/v1/Registries/{{Registry_instance}}
Content-Type: application/json
```

Response

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

Table 142 Message Registry File Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 ODATA Properties
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 JSON Schema File Location Property.

3.14.5 PrivilegeRegistry

The PrivilegeRegistry schema describes the operation-to-privilege mappings.

GET

Request

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

Content-Type: application/json

Response

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

Table 143 PrivilegeRegistry Property

Name	Type	Read Only	Description	
@odata.type	String	True	Refer Section ODATA Properties	
Id(M)	String	True	Resource Identifier	
Name(M)	String	True	Name of the Resource	
OEMPrivileges Used	Array	True	This property shall contain an array of OEM privileges used in this mapping. The default value is "ConfigureHostInterface".	
PrivilegesUsed(M)	Array	True	This property shall contain an array of Redfish standard privileges used in this mapping.	
			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.
Mappings (M)	Array	True	This property shall describe the mappings between entities and the relevant privileges that access those entities. Refer to Table PrivilegeRegistry Mapping Property.	

Table 144 PrivilegeRegistry Mapping Property

Name	Type	Read Only	Description
Entity	String	True	This property shall contain the Resource name, such as ''Manager''.
OperationMap	Object	True	This property shall list the mapping between HTTP methods and the privilege required for the Resource. Refer to Table PrivilegeRegistry OperationMap Property.
PropertyOverrides	Array	True	This property shall contain the privilege overrides of properties, such as the ''Password'' property in the ''ManagerAccount'' Resource. Refer to Table PrivilegeRegistry Target Privilege Map.
SubordinateOverrides	Array	True	This property shall contain the privilege overrides of the subordinate Resource. The target lists are identified by Resource type. Refer to Table PrivilegeRegistry Target Privilege Map.

Table 145 PrivilegeRegistry OperationMap Property

Name	Type	Read Only	Description
DELETE	Array of Objects	True	This property shall contain the privilege required to complete an HTTP DELETE operation. Refer to Table PrivilegeRegistry OperationPrivilege.
GET	Array of Objects	True	This property shall contain the privilege required to complete an HTTP GET operation. Refer to Table PrivilegeRegistry OperationPrivilege.
HEAD	Array of Objects	True	This property shall contain the privilege required to complete an HTTP HEAD operation. Refer to Table PrivilegeRegistry OperationPrivilege.
PATCH	Array of Objects	True	This property shall contain the privilege required to complete an HTTP PATCH operation. Refer to Table PrivilegeRegistry OperationPrivilege.
POST	Array of Objects	True	This property shall contain the privilege required to complete an HTTP POST operation. Refer to Table PrivilegeRegistry OperationPrivilege.
PUT	Array of Objects	True	This property shall contain the privilege required to complete an HTTP PUT operation. Refer to Table PrivilegeRegistry OperationPrivilege.

Table 146 PrivilegeRegistry Target Privilege Map

Name	Type	Read Only	Description
OperationMap	Object	True	This property shall contain the mapping between the HTTP operation and the privilege required to complete the operation.
Targets	Array	True	This property shall contain the array of URIs, Resource types, or properties. For example, ''/redfish/v1/Systems/1'', ''Manager'', or ''Password''. When the Targets property is not present, no override is specified.

Table 147 PrivilegeRegistry OperationPrivilege

Name	Type	Read Only	Description
Privilege	Array	True	This array shall contain an array of privileges that are required to complete a specific HTTP operation on a Resource. This set of strings match zero or more strings in the PrivilegesUsed and OEMPrivilegesUsed properties.

3.15 Update Service API

3.15.1 Update Service

This is the schema definition for the Update Service and its properties.

GET

Request

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

Content-Type: application/json

Response

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

Table 148 UpdateService Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer UpdateService Oem Object Table as given below in Table 132 **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 Resource
Status	Object	True	Refer Section StatusCodes for Resource.Oem. PCIeFunction will take the State & Health values as per the parent PCIeDevice. **NOTE** *HealthRollup is not applicable.*
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.
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 ODATA Properties
MaxImageSizeBytes	Integer	False	The maximum size in bytes of the software update image that this Service supports.

MultipartHttpPush Uri	String	False	The URI used to perform a Redfish Specification-defined Multipart HTTP or HTTPS push update to the Update Service. Refer Tables UpdateService – Actions - MultipartHttpPush Properties, UpdateService – Actions - MultipartHttpPush UpdateParameters Properties, UpdateService - Actions MultipartHttpPush OemParameters Properties and Refer MultipartHttpPush in Section UpdateService

Table 149 UpdateService Oem Object

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="8">AMIUpdateService</td><td rowspan="8">Object</td><td rowspan="8">True</td><td>Contains information related to AMI features supported by the Update Service.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>FlashPercentage</td><td>String</td><td>True</td><td>Percentage of flash done</td></tr>
<tr><td>UpdateStatus</td><td>String</td><td>True</td><td>Stage of UpdateService</td></tr>
<tr><td>UpdateTarget</td><td>String</td><td>True</td><td>Update Target</td></tr>
<tr><td>PreserveConfiguration</td><td>Object</td><td>True</td><td>The Preserve Configuration info.
NOTE
Please refer Table UpdateService - PreserveConfiguration</td></tr>
</table></td></tr>
</table>

Table 150 UpdateService - PreserveConfiguration

Name	Type	Read Only	Description
SDR	Boolean	False	To perserve SDR.
FRU	Boolean	False	To perserve FRU.
SEL	Boolean	False	To perserve SEL.
IPMI	Boolean	False	To perserve IPMI. It will preserve Network automatically if preserve IPMI
Network	Boolean	False	To perserve Network. It will preserve IPMI automatically if preserve Network.
NTP	Boolean	False	To perserve NTP.
SNMP	Boolean	False	To perserve SNMP. Support only CONFIG_SPX_FEATURE_SNMP_SUPPORT is enabled.
SSH	Boolean	False	To perserve SSH. Support only CONFIG_SPX_FEATURE_SOLSSH_SUPPORT or CONFIG_SPX_FEATURE_SMASH_LITE_SCORPIO is enabled.
KVM	Boolean	False	To perserve KVM.
Authentication	Boolean	False	To perserve Authentication.
Syslog	Boolean	False	To perserve Syslog.
CMX	Boolean	False	To perserve CMX. Support only CONFIG_SPX_FEATURE_CMM_SUPPORT is enabled.
WEB	Boolean	False	To perserve WEB.
EXTLOG	Boolean	False	To perserve SER.Support only CONFIG_SPX_FEATURE_EXTENDEDLOG_SUPPORT is enabled.
REDFISH	Boolean	False	To perserve REDFISH.
AUTOMATION_ ENGINE	Boolean	False	To perserve AUTOMATION_ENGINE. Support only CONFIG_SPX_FEATURE_AUTOMATION_ENGINE is enabled.

Table 151 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 Table 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 152 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 UpdateService – Actions - MultipartHttpPush UpdateParameters Properties
OemParameters	File	False	AMI OEM parameters in json format. Refer Table UpdateService – Actions - MultipartHttpPush OemParameters Properties

Table 153 UpdateService – Actions - MultipartHttpPush UpdateParameters Properties

Name	Type	Read Only	Description	
Targets	Array	False	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. **NOTE** *As each BMC firmware support diffirent component update with diffirent PRJ configuration, it is able to look up the list with GET FirmwareInventory Collection.Refer 3.15.2* *If Targets is not present or contains no targets in dual image support BMC and the ImageType is BMC or HPM image contains BMC compoment, Redfish will update only the inactive firmware 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
			/redfish/v1/UpdateService/FirmwareInventory/MSCC_**{controller_instance}**	Indicate to update RAID MSCC CONTROLLER component. **NOTE** *controller_instance is available when controller is connected.*
			/redfish/v1/UpdateService/FirmwareInventory/BRCM_**{controller_instance}**	Indicate to update RAID BRCM CONTROLLER component. **NOTE** *controller_instance is available when controller is connected.*

Table 154 UpdateService – Actions - MultipartHttpPush OemParameters Properties

Name	Type	Read Only	Description	
ImageType	String	False	Enum	Description
			BMC	Indidate uploaded file is a signed BMC image.
			HPM	Inididate uploaded file is an image in HPM format.
			BIOS	Inididate uploaded file is a signed BIOS image.
			PFR	Indicate uploaded file is a PFR update capsule. Supported only CONFIG_SPX_FEATURE_INTEL_PFR_SUPPORT is enabled.
			PLDM	Indicate Uploaded file is a PLDM Update capsule
defer	Boolean	False	Indicate PFR update is deferred until reboot. Supported only ImageType= ‘‘PFR’’	
active	Boolean	False	Indicate PFR update image on Active region. Supported only ImageType= ‘‘PFR’’	
recovery	Boolean	False	Indicate PFR update image on Recovery region. Supported only ImageType= ‘‘PFR’’	
preserveconf	Boolean	False	Indicate PFR update with preserving configuration (do not update Dynamic region if preserveconf is true). Supported only ImageType=’’PFR’’	

Table 155 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 verifing SSL certificate on HTTPS server during SSL handshake.

PATCH

Request

```
https://{{ip}}/redfish/v1/UpdateService
Content-Type: application/json
```

Example PATCH Request Body:

```
{
   ‘‘ServiceEnabled’’ : true,
   ‘‘Oem’’ : {
         ‘‘AMIUpdateService’’ : {
            ‘‘PreserveConfiguration’’ : {
               ‘‘IPMI’’ : true,
               ‘‘REDFISH’’ : true
            }
         }
   }
```

```
}
```

Response

The response status is 204 with no body. For Error Responses refer Section ''Redfish Error Response'' and Section ''Status Codes''.

POST

Simple Upade

Request

The TransferProtocol can be one of the following values: ''*HTTP*'', ''*HTTPS*'', ''*FTP*''.

```
POSThttps://{{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'' }
{'' TransferProtocol'' : ''HTTPS'' , ''ImageURI'' : ''http://{HTTPS_server_IP}/{image_name}.ima'' }

user account:
{'' TransferProtocol'' : ''FTP'' , ''ImageURI'' : ''ftp://{FTP_server_IP}/{image_name}.ima'' ,
''User'' : ''user_account'' , ''Password'' : ''user_password'' }
```

Response

The response status is 202 with the response message(refer Table Task Property). For Error Responses refer Section ''Redfish Error Response'' and Section ''Status Codes''.

MultipartHttpPush

Request

The request body shell be in the format of multipart/form-data and contain UpdateFile, UpdateParameters and OemParameters metions. Refer Table UpdateService – Actions – MultipartHttpPush UpdateParameters Properties and Table UpdateService – Actions - MultipartHttpPush OemParameters Properties.
The ImageType in OemParamters can be one of the following values: **''BMC'', ''HPM'', ''BIOS'', ''PFR'', ''PLDM''**.
The Targets in Parameters should be an array whose element is FirmwareInventory URI or an empty array. Refer Table UpdateService – Actions - MultipartHttpPush UpdateParameters Properties.

```
POST https://{{ip}}/ redfish/v1/UpdateService/upload
Content-Type: multipart/form-data; boundary=-------4939186033593465702222237
```

Example POST Request Body:

```
-------4939186033593465702222237
Content-Disposition: form-data; name= ''UploadFile'' ; filename= ''encrypted_rom.ima_enc''
Content-Type: application/octet-stream

<image_binary>
-------4939186033593465702222237
Content-Disposition: form-data; name= ''UpdateParameters'' ; filename= ''parameters.json''
```

```
Content-Type: application/json

{
   "Targets" :[
      "/redfish/v1/UpdateService/FirmwareInventory/BMC"
   ]
}
--------4939186033593465702222237
Content-Disposition: form-data; name= "OemParameters" ; filename= "oem_parameters.json"
Content-Type: application/json

{
   "ImageType" : "BMC"
}
--------4939186033593465702222237--
```

Response

The response status is 202 with the response message(refer Table Task Property). For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

3.15.2 SoftwareInventory Collection

This resource shall be used to represent a collection of firmware inventory.

GET

Request

```
https://{{ip}}/redfish/v1/UpdateService/FirmwareInventory
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.15.3 SoftwareInventory

This Resource contains a single software component that this Redfish Service manages.

GET

Request

https://{{ip}}/redfish/v1/UpdateService/FirmwareInventory /{{firmwareinventory_instance}}

Content-Type: application/json

Response

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

Table 156 SoftwareInventory Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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*

3.16 Action Info

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 comes with all Actions as follows:-

```
"Actions": {
    "#LogService.ClearLog": {
        "target": "/redfish/v1/Managers/Self/LogServices/SEL/Actions/LogService.ClearLog"
    }
}
```

Table 157 ActionInfo Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Id(M)	String	True	Refer Section Resource
Name(M)	String	True	Refer Section Resource
Description	String	True	Refer Section Resource
Parameters	Array	True	A parameter associated with the specified Redfish Action.

Table 158 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.
MinimumValue	Number	True	This integer or number property shall contain the minimum value that this service supports. For arrays, this property shall represent the minimum value for each array member. This property shall not be present for non-integer or number parameters.
MaximumValue	Number	True	This integer or number property shall contain the maximum value that this service supports. For arrays, this property shall represent the maximum value for each array member. This property shall not be present for non-integer or number parameters.

3.16.1 Redfish ActionInfo

Table 159 Redfish Action URI List

Action Name	ActionURI	Parameters		
		Name	Data Type	Allowable Values
Chassis.Reset	/redfish/v1/Chassis/{{system_instance}}/ResetActionInfo	ResetType	String	GracefulShutdown, On, ForceRestart, ForceOff, PowerCycle
Manager.Reset	/redfish/v1/Managers/{{system_instance}}/ResetActionInfo	ResetType	String	ForceRestart
ComputerSystem.Reset	/redfish/v1/Systems/Self/ResetActionInfo	ResetType	String	GracefulShutdown, On, ForceRestart, ForceOff, PowerCycle
Bios.ResetBios	/redfish/v1/Systems/{{system_instance}}/Bios/Actions/Bios.ResetBios	Empty		{}
Bios.ChangePassword	/redfish/v1/Systems/{{system_instance}}/Bios/ChangePasswordActionInfo	NewPassword	String	
		OldPassword	String	
		PasswordName	String	
SecureBoot.ResetKeys	/redfish/v1/Systems/{{system_instance}}/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/{{virtualmedia_instance}}/EjectMediaActionInfo	Empty		{}
InsertMedia	/redfish/v1/Managers/Self/VirtualMedia/{{virtualmedia_instance}}/InsertMediaActionInfo	Image	string	
		Inserted	boolean	True
		TransferMethod	string	Stream
		TransferProtocolTyp	String	NFS,CIFS,HTTPS,OEM
		UserName	String	
		Password	String	
		WriteProtected	boolean	True
Certificate.Rekey	/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/AccountService/LDAP/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/Managers/{ManagerId}/Certificates/{CertificateId}/Certificate.RekeyActionInfo /redfish/v1/Managers/{ManagerId}/NetworkProtocol/HTTPS/Certificates/{CertificateId}/Certificate.RekeyActionInfo	ChallengePasswordKeyBitLength	String Number	
Certificate.Renew	/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/Managers/{ManagerId}/NetworkProtocol/HTTPS/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/AccountService/L	ChallengePassword	String	

	DAP/Certificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/{CertificateId}/Certificate.RenewActionInfo /redfish/v1/Managers/{ManagerId}/Certificates/{CertificateId}/Certificate.RenewActionInfo			
CertificateService.ReplaceCertificate	/redfish/v1/CertificateService/CertificateService.ReplaceCertificateActionInfo	CertificateString	String	
		CertificateType	String	PEM
		CertificateUri	Object	
CertificateService.GenerateCSR	/redfish/v1/CertificateService/CertificateService.GenerateCSRActionInfo	AlternativeNames	String Array	
		ChallengePassword	String	
		City	String	
		CommonName	String	
		ContactPerson	String	
		Country	String	
		Email	String	
		GivenName	String	
		Initials	String	
		KeyBitLength	Number	
		KeyUsage	String Array	
		Organization	String	
		OrganizationalUnit	String	
		State	String	
		Surname	String	
		UnstructuredName	String	
		CertificateCollection	Object	

3.16.2 AMI OEM ActionInfo

Table 160 Redfish OEM Action URI List

Action Name	ActionURI	Parameters		
		Name	Data Type	Allowable Values
AmiBios.ChangeState	/redfish/v1/Systems/{{system_instance}}/Memory/{{memory_instance}}/ChangeStateActionInfo	State	String	Enabled, Disabled
AmiBios.ChangeState	/redfish/v1/Chassis/{{chassis_instance}}/PCIeDevices/{{PCIeDevice_instance}}/PCIeFunctions/{{PCIeFunction_instance}}/ChangeStateActionInfo	State	String	Enabled, Disabled
UpdateService.UploadCABundle	/redfish/v1/UpdateService/UploadCABundleActionInfo	ca_bundle	File	CA bundle path
VirtualMedia.EnableRMediaActionInfo	/redfish/v1/Managers/{{manager_instance}}/Oem/EnableRMediaActionInfo	RMediaState	String	”Enable” , ”Disable”
VirtualMedia.ConfigureCDInstanceActionInfo	/redfish/v1/Managers/{{manager_instance}}/Oem/ConfigureCDInstanceActionInfo	CDInstance	Number	0,1,2,3,4
RedfishPowerSaveMode	/redfish/v1/Managers/{{manager_instance}}/Oem/RedfishPowerSaveModeActionInfo	PowerSaveMode	String	”Enable” , ”Disable”
BackupConfigActionInfo	/redfish/v1/Managers/{{manager_instance}}/Oem/BackupConfigActionInfo	BackupFeatures	Array	"Network and Services", "Syslog", "KVM", "IPMI", "Authentication", "NTP", "SNMP"
RestoreConfigActionInfo	/redfish/v1/Managers/{{manager_instance}}/Oem/RestoreConfigActionInfo	conf_file	file	.bak file

3.17 CertificateService API

3.17.1 CertificateService

CertificateService describes a Certificate Service that represents the actions available to manage certificates and links to the certificates.

GET

Request

```
GET https://{{ip}}/redfish/v1/CertificateService
Content-Type: application/json
```

Response

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

Table 161 Certificate Service Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
CertificateLocations	Object	True	This object describes a Resource that an administrator can use in order to locate all certificates installed on a given service.

POST

GenerateCSR

Request

```
POST https://{{ip}}/redfish/v1/CertificateService/Actions/CertificateService.GenerateCSR
Content-Type: application/json
```

Request Body

Table 162 GenerateCSR Request Body

Name	Type	Description
AlternativeNames	StringArray	The additional host names of the component to secure.
CertificateCollection(M)	Object	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** *1. If KeyBitLength is not specific, the default value is 2048.* *2. The maximun value of KeyBitLength is 2048.* *3. The minimum value of KeyBitLength is 512.*
KeyUsage	StringArray	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.

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", "169.254.0.17" ],
   "Email" : "admin@contoso.org",
   "KeyBitLength" : 2048,
   "KeyUsage" : [ "DigitalSignature" ],
   "ChallengePassword" : "challengepassword",
   "GivenName" : "userGivenName",
   "ContactPerson" : "AMI Manager",
   "Initials" : "userInitials",
   "Surname" : "userSurname",
   "UnstructuredName" : "userUnstructuredName",
   "CertificateCollection" :
   { "@odata.id" : "/redfish/v1/Managers/Self/NetworkProtocol/HTTPS/Certificates" }
}
```

Response

The response of the request is success with status code as 200 and will be in JSON format. The properties are mentioned in the following table.

Table 163 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.

ReplaceCertificate

Request

POST https://{{ip}}/redfish/v1/CertificateService/Actions/CertificateService.ReplaceCertificate

Content-Type: application/json

Request Body

Table 164 ReplaceCertificate Request Body

Name	Type	Description
CertificateString (M)	String	This parameter shall contain the string of the certificate, and the format shall follow the requirements specified by the CertificateType property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and it is needed to use the certificate, the client shall provide the private key as part of the string in the POST request. **NOTE** 1.*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. Only certificate or private key in correct CertificateType format will be recognized. The other strings which don't follow CertificateType format will be ignored.*
CertificateCollection(M)	String	The format of the certificate. Enum: PEM — A Privacy Enhanced Mail (PEM)-encoded single certificate Enum: PEMchain — A Privacy Enhanced Mail (PEM)-encoded certificate chain. **NOTE** *The PEMchain is only supported for HTTPS Certificate.*
CertificateUri(M)	Object	The link to the certificate that is being replaced.

Example POST Request Body:

```
{
"CertificateString" : "-----BEGIN CERTIFICATE-----
\nMIIEOzCCAyOgAwIBAgIJAO8c/Hd0c/0GMA0GCSqGSIb3DQEBCwUAMIG7MQswCQYD\nVQQGEwJ
VUzEQMA4GA1UECAwHR2VvcmdpYTERMA8GA1UEBwwITm9yY3Jvc3MxNDAy\nBgNVBAoMK0FtZX
JpY2FuIE1lZ2F0cmVuZHMgSW50ZXJuYXRpb25hbCBMTEMgKEFN\nSSkxGzAZBgNVBAsMElNlcnZp
```

*Y2UgUHJvY2Vzc29yczEUMBIGA1UEAwwLbWVnYXJh\nYy5jb20xHjAcBgkqhkiG9w0BCQEWD3N1cHBvcnRAYW1pLmNvbTAeFw0xOTA4Mjcx\nMzAzMDBaFw0zNDA4MjMxMzAzMDBaMIG7MQswCQYDVQQGEwJVUzEQMA4GA1UECAwH\nR2VvcmdpYTERMA8GA1UEBwwITm9yY3Jvc3MxNDAyBgNVBAoMK0FtZXJpY2FuIE1l\nZ2F0cmVuZHMgSW50ZXJuYXRpb25hbCBMTEMgKEFNSSkxGzAZBgNVBAsMElNlcnZp\nY2UgUHJvY2Vzc29yczEUMBIGA1UEAwwLbWVnYXJhYy5jb20xHjAcBgkqhkiG9w0B\nCQEWD3N1cHBvcnRAYW1pLmNvbTCCASIwDQYJKoZIhvcNAQEBBQADggEPADCCAQoC\nggEBAPjhY7RBU5kLGB3yHZfiEk9Zm9vJhe/1mRZlWTT77g8iy5eo2L9BiIsctpTm\n2clMGBRwFgCjOyZqkldU2Mu2zeALS31Bkvx12/OOloG/MkvVxc09MrNWwEU0Q2Az\njGu7X+bEKSAQAYzFZIWSYf4hnadEtzh53rkdk9mKYp101YfnAqZ+zg9MxXuzl8TM\nEGh7iemTtwozsLTHlwIiH6cIKNm7TmsL7ILifEQUP4wBTJBf1nmVe80fdNoDC+FB\nnvXwSuvHI5wIt4Nd2hthI6Ll6GRJrKGFE7FsqxVzBVb2anp8U44VDV69guPo47XlS\n2yYXHPNwZmw9zm7mD5TCRJLKT20CAwEAAaNAMD4wCQYDVR0TBAIwADALBgNVHQ8E\nBAMCBeAwJAYDVR0RBB0wG4ILbWVnYXJhYy5jb22CDDE2OS4yNTQuMC4xNzANBgkq\nhkiG9w0BAQsFAAOCAQEAZi3ILVGGyVR6LJ+Au7gY5w9T+k+CpXgzorF+yRcSJo/h\n/kfSMPPgH6yY+5ja4Z9kQ57nTfnaBqmHnEhwhAQrPVAPd3iKYEHNHO4u0gB4ZnkA\nyeLA4vM3KG5510Iry8oBhYuvwZwE3YhtYNNocZd1ct5A8zJmpeuS4ffPwWFGZGmV\nfiDSGa4NdzLr1auPt5FUgbsm5V0FNPNhYNRPYvHRMYh+orv727sJrxocr4BJ3ncq\nUGNdPvVow5QQrmm0WsSjv285F3BiIeE1b6iSDksiiZ4lYLcr8twBeTq5gjc91qVh\nY7Ms4UrZYTJhYxq0oVGplADOn+LL9qEZ9MXAR6SkeQ==\n-----END CERTIFICATE-----\n-----BEGIN RSA PRIVATE KEY-----
\nMIIEowIBAAKCAQEA+OFjtEFTmQsYHfldl+IST1mb28mF7/WZFmVZNPvuDyLLI6jY\nv0Glixy2lObZyUwYFHAWAKM7JmqSV1TYy7bN4AtLfUGS/HXb846Wgb8yS9XFzT0y\ns1bARTRDYDOMa7tf5sQpIBABjMVkhZJh/iGdp0S3OHneuR2T2YpinXTVh+cCpn7O\nD0zFe7OXxMwQaHuJ6ZO3CjOwtMeXAilfpwgo2btOawvsguJ8RBQ/jAFMkF/WeZV7\nnzR902gML4UG9fBK68cjnAi3g13aG2EjouXoZEmsoYUTsWyrFXMFVvZqenxTjhUNX\nr2C4+jjteVLbJhcc83BmbD3ObuYPlMJEkspPbQIDAQABAoIBACTpiNgbOELimlkW\np7z3ErAiIjOe1/aW/nWL4ocxNkWYa4m6ySrUlWPMhmffNT3dw1SEqz689vDjrYC2\nXNEZ877e7ftN1ncLI+wjob7slJEay5N9GB/xJeMdtUB3ZMQ1riuTvGW8+f3e6OHG\nrDH82l0MnAAMUzQxZtRE6gtgYKsfFSyxgMc+X4i1hZUszA1IKa2uXk+6XmEEtuCu\noadu5KmHM0Oxh5ph4JCb1HgSxrRVjunsd+x1zNPFcJchjz4V5CRQ6gDPl/EzmrF1\n
TtdnsW8gFzh6v6faHe11bCDrXIG3wDlqOwPHm7Vk0TqToMgEceEu+DcLcnEun2iK\nrWD13SECgYEA/xyzJOenwIEVuxHizb8H7ZwgYV5k1jj0ygzRFEGf+vrDi8ao9HR+\nbSKmqG1oZi0Dorat1wQb3Lj5ggoYRiYP1SPGqdFDaDgdn9jcuVFQpQ+5jsLB8V03\noAUmSEB9Yk3eGZ1XAZro+FzGb5BsZyaG0QlLnCcQx/GcJZ+G75lgJt8CgYEA+b8j\nKu0XrBaBrGCs988OSpuebEQgO7zZH9TvN+ea2ZR9N7cDOXsSpsTQsjJsQ4pwlhOD\ng0Jv3CTFKCqK2inXA3SJ+UzlmvlPDg31+Y3qbpA+ZBYjG8rp7v4uSjbBBFkbxJuV\n1S8oVQbIfljdTfnypK5+TPTNig4C5IBzAuqUjzMCgYB0+VHjIB05FXdDWYYnVOpr\ntuTaAJA38dG8O3g604RpbkXvd13NCQVXQUYtgE0YXJeIKj83kfi8kkxFph9POvCT\niF31S7CevuxGeQdsKa7Sol0yunZ3F4kD5JiTFI7pXk7ya8STRdaA2vlZ+lzaRz4V\n5y82IGt/Ynd4gNc8UZVW/QKBgQCKdeubauMK51dxKA/9O3Ai8O/9+i8cr3B482bE\nnycTSCD772p0RCyimCMvjX40iTOgqHEN3TCgUFtavlBZzKWspYTz1WCqbosOx+Q98\nEa/9KD9O4e8JA5B6jbVAM+cC8Bwy/kctb/2eVipl0gKvrnlVz9/57mbduTLlWElr\nPn6qfQKBgEqL9ShURu6pytGIfF6CVPT1DiXXvzAvj8KWwdWpwob3BFl+82T9jNgt\nVv441iirH4izd7IzPNv56vb3F4D2lY4zAfWhfrMytrv8aKghDyyZq5Qo6mXmz5hq\nd071CuwqgoRn6UG5gZWs+B/Oh16xPYkwZmZOYEZaoE7ubEtzB7qW\n-----END RSA PRIVATE KEY-----,
"CertificateType" : "PEM",
"CertificateUri" : { "@odata.id" :
"/redfish/v1/Managers/Self/NetworkProtocol/HTTPS/Certificates/1" }
}

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section "Redfish Error Response" and "Status Codes".

3.17.2 CertificateLocations

CertificateLocations describes a Resource that an administrator can use in order to locate all certificates installed on a given service.

GET

Request

```
GET https://{{ip}}/redfish/v1/CertificateService/CertificateLocations
Content-Type: application/json
```

Response

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

Table 165 CertificateLocations Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource.
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	The number of items in a collection.
Oem	Object	True	Refer Table Resource Complex Types under Section Resource **NOTE** *Refer section CertificateLocations OEM Properties for Oem Properties.*

3.17.3 CertificateCollections

CertificateCollection describes a collection of Certificate Resource instances.

GET

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/Managers/{ManagerId}/Certificates

GET https://{{ip}}/redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates

GET https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates

GET https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates

GET

https://{{ip}}/redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{SecurebootDatabase_instance}/Certificates

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

POST[Creating new Certificate]

Request

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

POST https://{{ip}}/redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates

POST https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates

POST https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates

POST

https://{{ip}}/redfish/v1/Systems/{ ComputerSystemId}/SecureBoot/SecureBootDatabases/{SecurebootDatabase_instance }/Certificates

Content-Type: application/json

Request Body

Table 166 CertificateCollection POST Request Property

Name	Type	Description
CertificateString (M)	String	This parameter shall contain the string of the certificate, and the format shall follow the requirements specified by the CertificateType property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and it is needed to use the certificate, the client shall provide the private key as part of the string in the POST request. **NOTE** 1. *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. *Only certificate or private key in correct CertificateType format will be recognized. The other strings which don t follow CertificateType format will be ignored.* 4. *Key length of uploaded certificate is limited under 2048-bit.* ***Note for LDAP Certificate:*** 1. *For LDAP Certificate alone relax the limit of certificate's key length to 4096 on POST call.* 2. *Forbid Rekey action if current certificate's key length over 2048* 3. *Keep the limit of key length 2048 in Rekey action*
CertificateType(M)	String	The link to the Certificate Resource Collection where the certificate is installed. **NOTE** *CertificateType property only supports PEM format.*
UefiSignatureOwnerString	String	The value of this property shall contain the GUID of the UEFI signature owner for this certificate as defined by the UEFI Specification. **NOTE** *This property shall only be present for secure boot database certificates.*

Example POST Request Body:


```
{
   "CertificateString" : "------BEGIN CERTIFICATE-----
\nMIIC2DCCAoICCQDrKFHkCkpC2zANBgkqhkiG9w0BAQsFADCB8jELMAkGA1UEBhMC\nVVMxDzA
NBgNVBAgMBk9yZWdvbjERMA8GA1UEBwwIUG9ydGxhbmQxEDAOBgNVBAoM\nB0NvbnRvc28xDDA
KBgNVBAsMA0FCQzEcMBoGA1UEAwwTbWFuYWdlci5jb250b3Nv\nLm9yZzEgMB4GCSqGSIb3DQEJ
ARYRYWRtaW5AY29udG9zby5vcmcxGjAYBgNVBCkM\nEXRlc3RDb250YWN0UGVyc29uMRYwFAYDV
QQqDA10ZXN0R2I2ZW5OYW1lMRUwEwYD\nVQQrDAx0ZXN0SW5pdGlhbHMxFDASBgNVBAQMC3Rl
c3RTdXJuYW1lMB4XDTE5MTIx\nOTAyNTg0NVoXDTIwMDExODAyNTg0NVowgfIxCzAJBgNVBAYTAl
VTMQ8wDQYDVQQI\nDAZPcmVnb24xETAPBgNVBAcMCFBvcnRsYW5kMRAwDgYDVQQKDAdDb250
b3NvMQww\nCgYDVQQLDANBQkMxHDAaBgNVBAMME21hbmFnZXIuY29udG9zby5vcmcxIDAeBgkq
\nhkiG9w0BCQEWEWFkbWluQGNvbnRvc28ub3JnMRowGAYDVQQpDBF0ZXN0Q29udGFj\ndFBlcnNv
bjEWMBQGA1UEKgwNdGVzdEdpdmVuTmFtZTEVMBMGA1UEKwwMdGVzdElu\naXRpYWxzMRQwEg
YDVQQEDAt0ZXN0U3VybmFtZTBcMA0GCSqGSIb3DQEBAQUAA0sA\nMEgCQQC2vTAZtvPrByReb06
5z6E/n7Rv8ymt4Goowjet6s0kfm/WnJumTt0/eJfk\n2j5c+XSg6q1wgmZOZA+NZVL7DFUjAgMBAAEw
DQYJKoZIhvcNAQELBQADQQCsYyRY\n3RX7fsLQr0M/LgHCHF9ke9mF8KsockAQlZLkXuwSZHe6+0b
7p6OeWrdiuil6cpmO\nb32QIGFrKWq8JXD+\n-----END CERTIFICATE-----\n-----BEGIN PRIVATE KEY-----
\nMIIBVgIBADANBgkqhkiG9w0BAQEFAASCAUAwggE8AgEAAkEAtr0wGbbz6wckXm9O\nuc+hP5+0b
/MpreBqKMI3rerNJH5v1pybpk7dP3iX5No+XPl0oOqtcIJmTmQPjWVS\n+wxVIwIDAQABAkEAn6j0Wc
NLolF/KTM/KYGLdTdoQ1fFVrH4jtwCIeZAjlygCliT\nKcb1AOsO/jxKFaK/ZUUVk5lWomxnZBy641r+AQI
hANpX0+K7kUUm4L7x1VgFfRUh\nal8ns1MneAkbL0z0j+NjAiEA1kFjSAJIki1fkakXtixdiZz9GdRbgLBF
M4cZJXtT\n00ECIQCNkCIdwBTI7BMNWghD4JMfryGjfj8DK/Tkmo6Ja4sbFwIhAKF1FwcNyXh2\nvt06
qsa6uiZY6pbLY8UfkJabCUUooevBAiAzw38GApvYqlQeSRQcHTMx/LN6a6NY\nJlxeaUXwCcsIuw==\n-
----END PRIVATE KEY-----\n",
   "CertificateType" : "PEM"
}
```


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.

3.17.4 Certificate

Certificate describes a certificate that proves the identify of a component, account, or service.

GET

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/AccountService/LDAP/Certificates/1

GET https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1

GET https://{{ip}}/redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{SecurebootDatabase_instance}/Certificates/{CertificateId}

GET https://{{ip}}/redfish/v1/Managers/{ManagerId}/Certificates/{CertificateId}

Content-Type: application/json

Response

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

Table 167 Certificate Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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.* **NOTE** if there are any Boot Certificate setting in Oem property, there are OwnerGuid in the reponse body.
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 Resource
Issuer	Object	True	The issuer of the certificate. Please refer to Table The identifier information about a certificate.

<table>
<tr><td>KeyUsage</td><td>Null, Array</td><td>True</td><td>The key usage extension, which defines the purpose of the public keys in this certificate. Default value for this property is null.<table><tr><th>Enum</th><th>Description</th></tr><tr><td>CRLSigning</td><td>Verifies signatures on certificate revocation lists (CRLs).</td></tr><tr><td>ClientAuthentication</td><td>TLS WWW client authentication.</td></tr><tr><td>CodeSigning</td><td>Signs downloadable executable code.</td></tr><tr><td>DataEncipherment</td><td>Directly enciphers raw user data without an intermediate symmetric cipher.</td></tr><tr><td>DecipherOnly</td><td>Deciphers data while performing a key agreement.</td></tr><tr><td>DigitalSignature</td><td>Verifies digital signatures, other than signatures on certificates and CRLs.</td></tr><tr><td>EmailProtection</td><td>Email protection.</td></tr><tr><td>EncipherOnly</td><td>Enciphers data while performing a key agreement.</td></tr><tr><td>KeyAgreement</td><td>Key agreement.</td></tr><tr><td>KeyCertSign</td><td>Verifies signatures on public key certificates.</td></tr><tr><td>KeyEncipherment</td><td>Enciphers private or secret keys.</td></tr><tr><td>NonRepudiation</td><td>Verifies digital signatures, other than signatures on certificates and CRLs, and provides a nonrepudiation service that protects against the signing entity falsely denying some action.</td></tr><tr><td>OCSPSigning</td><td>Signs OCSP responses.</td></tr><tr><td>ServerAuthentication</td><td>TLS WWW server authentication.</td></tr><tr><td>Timestamping</td><td>Binds the hash of an object to a time.</td></tr></table></td></tr>
<tr><td>Subject</td><td>Object</td><td>True</td><td>The subject of the certificate.
Please refer to Table The identifier information about a certificate.</td></tr>
<tr><td>ValidNotAfter</td><td>String</td><td>True</td><td>The date when the certificate is no longer valid.</td></tr>
<tr><td>ValidNotBefore</td><td>String</td><td>True</td><td>The date when the certificate becomes valid.</td></tr>
<tr><td>CertificateString</td><td>String</td><td>True</td><td>This parameter shall contain the string of the certificate, and the format shall follow the requirements specified by the CertificateType property value. If the certificate contains any private keys, they shall be removed from the string in responses. If the service does not know the private key for the certificate and it is needed to use the certificate, the client shall provide the private key as part of the string in the POST request.</td></tr>
<tr><td>CertificateType</td><td>String</td><td>True</td><td>The format of the certificate.</td></tr>
<tr><td>UefiSignatureOwner</td><td>String</td><td>True</td><td>The value of this property shall contain the GUID of the UEFI signature owner for this certificate as defined by the UEFI Specification.
NOTE
This property shall only be present for secure boot database certificates.</td></tr>
</table>

Table 168 The identifier information about a certificate

Name	Type	Read Only	Description
City	String	True	The city or locality of the organization of the entity.
CommonName	String	True	The fully qualified domain name of the entity.
Country	String	True	The country of the organization of the entity.
Email	String	True	The email address of the contact within the organization of the entity.
Organization	String	True	The name of the organization of the entity.
OrganizationalUnit	String	True	The name of the unit or division of the organization of the entity.
State	String	True	The state, province, or region of the organization of the entity.

DELETE

Request

DELETE https://{{ip}}/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}

DELETE https://{{ip}}/redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates/{CertificateId}

DELETE https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/1

DELETE https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1

DELETE https://{{ip}}/redfish/v1/Systems/{ComputerSystemId}/SecureBoot/SecureBootDatabases/{SecurebootDatabase_instance}/Certificates/{CertificateId}

Content-Type: application/json

Response

The response status is 204 and no response body. For Error Responses refer Section ''Redfish Error Response'' and Section ''Status Codes''.

POST

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).

Request

POST https://{{ip}}/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}/Actions/Certificate.Rekey

POST https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/NetworkProtocol/HTTPS/Certificates/{CertificateId}/Actions/Certificate.Rekey

POST https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Boot/Certificates/{CertificateId}/Actions/Certificate.Rekey

POST https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/1/Actions/Certificate.Rekey

POST

https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1/Actions/Certificate.Rekey

Content-Type: application/json

Request Body

Table 169 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** *4. If KeyBitLength is not specific, the default value is 2048.* *5. The maximun value of KeyBitLength is 2048.* *6. The minimum value of KeyBitLength is 512.*

Example POST Request Body:

```
{
   "KeyBitLength" : 512,
   "ChallengePassword" : "challengepassword"
}
```

Response

The response status is 200 with the response body in JSON format. The properties are mentioned in the following table.

Table 170 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.

Renew

Renew action shall generate a certificate signing request using the existing information and key-pair of the certificate. The response shall contain a signing request that a certificate authority (CA) must sign. The service should retain the private key that this request generates for when the certificate is installed. The private key should not be part of the response.

Request

POST https://{{ip}}/redfish/v1/AccountService/Accounts/{ManagerAccountId}/Certificates/{CertificateId}/Actions/Certificate.Renew

POST https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/NetworkProtocol/HTTPS/Certificates/{CertificateId}/Actions/Certificate.Renew

POST https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Boot/Certificates/{CertificateId}/Actions/Certificate.Renew

POST https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/1/Actions/Certificate.Renew

POST https://{{ip}}/redfish/v1/AccountService/LDAP/Certificates/Oem/Ami/ClientCertificates/1/Actions/C

ertificate.Renew

Content-Type: application/json

Request Body

Table 171 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"
}
```

Response

The response status is 200 with the response body in JSON format. The properties are mentioned in the following table.

Table 172 Renew Action Request 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.

3.18 Redfish.Settings

Redfish settings shall describe any settings of a Resource.

Table 173 Redfish.Settings properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section ODATA Properties
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.
MaintenanceWindowResource	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 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 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 adminstrator.
Time	String	True	This property shall indicate the time when the settings were applied to the Resource.

Table 174 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 Table Resource Complex Types under Section Resource. **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.*

3.19 LogService API

3.19.1 LogServiceCollection

This represents the collection of Log Service resources.

GET

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

Response

Please refer Section Collection for the JSON response properties.

3.19.2 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.

GET

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/LogService
Content-Type: application/json

system_log_instance - BIOS,SMI

manager_log_instance - AuditLog, SEL and EventLog

chassis_log_instance - Logs

Response

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

Table 175 Log Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
ServiceEnabled	Boolean	False	Indicates whether this service is enabled. Default it will be true 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 Telemetry Service 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: WrapsWhenFull — Description: 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. **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* **NOTE** *According to UNIX time maximum date allowed to PATCH is 2038-01-18 and minimum date allowed to PATCH is 1970-01-02.*
DateTimeLocalOffset	String	False	The time offset from UTC that the DateTime property is set to in format: +06:00.

<table>
<tr><td></td><td></td><td></td><td colspan="2">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</td></tr>
<tr><td>Actions</td><td>Object</td><td>True</td><td colspan="2">The Actions property shall contain the available actions for this resource like LogService.ClearLog or any other OEMActions.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td colspan="2">Refer Section Resource for Resource.Status.</td></tr>
<tr><td>Entries(N)</td><td>Object</td><td>True</td><td colspan="2">The value of this property shall reference a collection of resources of type. Refer Section Log Entry</td></tr>
<tr><td>LogEntryType</td><td>String</td><td>True</td><td colspan="2">The format of the log entries.</td></tr>
<tr><td></td><td></td><td></td><td>Enum</td><td>Description</td></tr>
<tr><td></td><td></td><td></td><td>Event</td><td>The log contains Redfish-defined messages (events).</td></tr>
<tr><td></td><td></td><td></td><td>SEL</td><td>The log contains legacy IPMI System Event Log (SEL) entries.</td></tr>
<tr><td></td><td></td><td></td><td>Multiple</td><td>The log contains multiple Log Entry types or a single entry type cannot be guaranteed by the Log Service.</td></tr>
<tr><td></td><td></td><td></td><td>OEM</td><td>The log contains entries in an OEMdefined format.</td></tr>
</table>

POST

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/Systems/Self/LogServices/BIOS/Actions/LogService.ClearLog
https://{{ip}}/redfish/v1/Systems/Self/LogServices/SMI/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
https://{{ip}}/redfish/v1/Managers/Self/LogServices/EventLog/Actions/LogService.ClearLog
https://{{ip}}/redfish/v1/Managers/Self/LogServices/SEL/Actions/LogService.ClearLog
https://{{ip}}/redfish/v1/TelemetryService/LogService/Actions/LogService.ClearLog

Example POST Request Body:

```
{
}
```

Response

The response of the request will be in JSON format with the success status code as 202. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

```
{
    "@odata.context": "/redfish/v1/$metadata#Task.Task",
    "@odata.id": "/redfish/v1/TaskService/Tasks/1",
    "@odata.type": "@Task.v1_4_2.Task",
```

```
    "Description": "Task for Chassis LogService",
    "Id": "1",
    "Name": "Chassis LogService",
    "TaskMonitor": "/redfish/v1/TaskService/TaskMonitors/1",
    "TaskState": "New"
}
```

3.19.3 LogEntryCollection

This represents the collection of Log Entry resources.

GET

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/LogService/Entries
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

3.19.4 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.

GET

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/TelemetryService/LogService/Entries/{{telemetry_logentry_instance}}

Content-Type: application/json

Response

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

Table 176 Log Entry Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
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

<table>
<tr><td></td><td></td><td></td><td>indicate a unique identifier for the event, the format of which is implementation dependent.
NOTE
This property will be populated only for EventLogs. EventId format is implementation dependent and value will be string of a positive integer.</td></tr>
<tr><td>EventTimestamp</td><td>String</td><td>True</td><td>If present, this LogEntry records an Event and the value shall be the time the event occurred.</td></tr>
<tr><td>EntryType(M)</td><td>String</td><td>True</td><td>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, SELor Oem.</td></tr>
<tr><td>EntryCode</td><td>String</td><td>True</td><td>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.
NOTE
Severity will show as OK if enum value mentioned below is not matches with Event_Type(Event/Reading Type Code from table 43 of the IPMI Specification-version2-rev1-1) which is present in Message.
<table>
<tr><th>String</th><th>Severity</th></tr>
<tr><td>Assert</td><td>OK</td></tr>
<tr><td>Deassert</td><td>Critical</td></tr>
<tr><td>Lower Non-critical - going low</td><td>Warning</td></tr>
<tr><td>Lower Non-critical - going high</td><td>Warning</td></tr>
<tr><td>Lower Critical - going low</td><td>Critical</td></tr>
<tr><td>Lower Critical - going high</td><td>Critical</td></tr>
<tr><td>Lower Non-recoverable - going low</td><td>Critical</td></tr>
<tr><td>Lower Non-recoverable - going high</td><td>Critical</td></tr>
<tr><td>Upper Non-critical - going low</td><td>Warning</td></tr>
<tr><td>Upper Non-critical - going high</td><td>Warning</td></tr>
<tr><td>Upper Critical - going low</td><td>Critical</td></tr>
<tr><td>Upper Critical - going high</td><td>Critical</td></tr>
<tr><td>Upper Non-recoverable - going low</td><td>Critical</td></tr>
<tr><td>Upper Non-recoverable - going high</td><td>Critical</td></tr>
<tr><td>Transition to Idle</td><td>Warning</td></tr>
<tr><td>Transition to Active</td><td>OK</td></tr>
<tr><td>Transition to Busy</td><td>Warning</td></tr>
<tr><td>State Deasserted</td><td>Warning</td></tr>
<tr><td>State Asserted</td><td>OK</td></tr>
<tr><td>Predictive Failure deasserted</td><td>Warning</td></tr>
<tr><td>Predictive Failure asserted</td><td>OK</td></tr>
<tr><td>Limit Not Exceeded</td><td>OK</td></tr>
<tr><td>Limit Exceeded</td><td>Warning</td></tr>
<tr><td>Performance Met</td><td>OK</td></tr>
<tr><td>Performance Lags</td><td>Warning</td></tr>
</table></td></tr>
</table>

			Transition to OK	OK
			Transition to Non-Critical from OK	Critical
			Transition to Critical from less severe	Critical
			Transition to Non-Critical from more severe	Critical
			Transition to Non-recoverable from less severe	Critical
			Transition to Critical from Non-recoverable	Critical
			Transition to Non-recoverable	Critical
			Monitor	OK
			Informational	OK
			Device Removed / Device Absent	Warning
			Device Inserted / Device Present	OK
			Device Disabled	Warning
			Device Enabled	OK
			Transition to Running	OK
			Transition to In Test	OK
			Transition to Power Off	OK
			Transition to On Line	OK
			Transition to Off Line	OK
			Transition to Off Duty	OK
			Transition to Degraded	Warning
			Transition to Power Save	OK
			Install Error	Critical
			Fully Redundant	OK
			Redundancy Lost	Warning
			Redundancy Degraded	Warning
			Non-redundant: Sufficient Resources from Redundant	OK
			Non-redundant:Sufficient Resources from Insufficient Resources	Warning
			Non-redundant:Insufficient Resources	Warning
			Redundancy Degraded from Fully Redundant	Warning
			Redundancy Degraded from Non-redundant	Critical
			D0 Power State	OK
			D1 Power State	OK
			D2 Power State	OK
			D3 Power State	OK
			OEM	OK
SensorType	String	True	This property shall be present if the EntryType value is SEL. **NTOE** *This attribute is not applicable for Telemetry Log Service Entries.*	
			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 Critical Interrupt Button/Switch Module/Board Microcontroller/Coprocessor Add-in Card Chassis ChipSet Other FRU Management Subsystem Health Battery Session Audit Version Change FRUState OEM
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. **NOTE** *This attribute is not applicable for Telemetry Log Service Entries.*	
Message	String	True	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. **NOTE** *Populated for all logs.* *EntryType is "SEL" then Message contain SEL message format specified in Table 32-1 SEL Event Records in IPMI Specification v2.0 revision 1.1*	
MessageId	String	True	This property shall the MessageId property of the event and decodes from EntryType. If EntryType is "Event" then it is a Redfish Specification-defined MessageId. If EntryType is "SEL" then it contain Event Data otherwise "Oem" specific information. **NOTE** *Populated for all logs.* *EntryType is "Event" then MessageId format will be*	

<table>
<tr><td></td><td></td><td></td><td>RegistryName.MajorVersion.MinorVersion.MessageKey EntryType is “SEL” then MessageId format will be ^0[xX](([afA-F]|[0-9]){2}){3}$ i.e. first byte is EventData1 second byte is EventData2 and third byte is EventData 3.</td></tr>
<tr><td>MessageArgs</td><td>Array</td><td>True</td><td>This contains message arguments to be substituted into the message included or in the message looked up via a registry.
NOTE
Populated only for AuditLog, EventLog and MetricReportLog.</td></tr>
<tr><td>Links</td><td>Object</td><td></td><td>Contains references to other resources that are related to this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>Refer Section Resource for Links under Table 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>
</table></td></tr>
<tr><td>OemLogEntryCode</td><td>String</td><td>True</td><td>If the LogEntryCode type is OEM, this will contain the OEM-specific entry code.
NOTE
Northbound only support.</td></tr>
<tr><td>OemSensorType</td><td>String</td><td>True</td><td>If the Sensor Type is OEM, this will contain the OEMspecific sensor type.
NOTE
Northbound only support.</td></tr>
<tr><td>DiagnosticDataType</td><td>String</td><td>True</td><td>The type of diagnostic data available at the AdditionalDataURI location.</td></tr>
<tr><td>AdditionalDataURI</td><td>String</td><td>True</td><td>The URI at which to access the additional data for the log entry, such as diagnostic data, image captures, or other files. Once you get the URI, you can use the URI to download the file.</td></tr>
<tr><td>AdditionalDataSizeBytes</td><td>Number</td><td>True</td><td>The size of the additional data for the log entry.</td></tr>
</table>

Chapter 4. Redundancy

This is the schema definition for the Redundancy resource. This is the redundancy definition to be used in other resource schemas.

Table 177 Redundancy Properties

Name	Type	Read Only	Description
MessageId	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. Sharing: Multiple units contribute or share such that operation will continue, but at a reduced capacity, if one or more units fail. Sparing: One or more spare units are available to take over the function of a failed unit, but takeover is not automatic.
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 Resource 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.*
RedundancySet (M)	Array	True	Contains any ids that represent components of this redundancy set.
RedundancyEnabled	Boolean	False	This indicates whether redundancy is enabled.

Chapter 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)**".

5.1 HostInterface Collection

It displays a collection of Host Interfaces available in Managers.

GET

Request

```
https://{{ip}}/redfish/v1/Managers/{{system_instance}}/HostInterfaces
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

5.2 HostInterface

In HostInterface specification HostAutoFW & HostAutoOS are the only 2 Accounts allowed for this Interface.

GET

Request

https://{{ip}}/redfish/v1/Managers/{{system_instance}}/HostInterfaces/{{hostinterface_instance}}

Content-Type: application/json

Response

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

Table 178 HostInterface Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
HostInterfaceType	String	True	Enum value: NetworkHostInterface
Status	Object	True	Refer Section Resource for Resource.Oem.
InterfaceEnabled	Boolean	True	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	This property contains the Role for kernel authentication on this interface. **NOTE** • Default value for this RoleId is HostInterfaceAdministrator and can be patched to any one of the RoleId's ''Operator'', ''ReadOnly'' or User defined RoleId's. • This property has been deprecated in favor of newer methods of negotiating credentials. This property is supported to allow Bios Backward Compactibility. 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. Refer section for Predefined Roles and Privileges.		
KernelAuthEnabled	Boolean	False	This indicates whether this kernel authentication is enabled for this interface. **NOTE** • Only if this property is Enabled i..e true, HostAutoOS account can be created. • This property has been deprecated in favor of newer methods of negotiating credentials. This property is supported to allow Bios Backward Compactibility.	
FirmwareAuthRoleId	String	False	This property contains the Role for firmware authentication on this interface. **NOTE** • Default value for this RoleId is HostInterfaceAdministrator and can be patched to any one of the RoleId's ''Operator'', ''ReadOnly'' or User defined RoleId's. • This property has been deprecated in favor of newer methods of negotiating credentials. This property is supported to allow Bios Backward Compactibility		

<table>
<tr><td></td><td></td><td></td><td>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. Refer section Predefined Roles and Privileges.</td></tr>
<tr><td>FirmwareAuthEnabled</td><td>Boolean</td><td>False</td><td>This indicates whether this firmware authentication is enabled for this interface.
NOTE
• Only if this property is Enabled i..e true, HostAutoFW account can be created.
• This property has been deprecated in favor of newer methods of negotiating credentials. This property is supported to allow Bios Backward Compactibility.</td></tr>
<tr><td>Links</td><td>Object</td><td></td><td>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.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>ComputerSystems@odata.count</td><td>Number</td><td>True</td><td>An integer representing the number of items in a collection</td></tr>
<tr><td>ComputerSystems</td><td>Array</td><td>True</td><td>An array of references to the Computer Systems connected to this Host Interface.</td></tr>
<tr><td>CredentialBootstrappingRole</td><td>Object</td><td>True</td><td>The link to the role that contains the privileges for the bootstrap account created for this interface.</td></tr>
<tr><td>KernelAuthRole</td><td>Object</td><td>True</td><td>A reference to the Role object defining Privileges for this Host Interface when using kernel authentication.
NOTE
This property has been deprecated in favor of newer methods of negotiating credentials. This property is supported to allow Bios Backward Compactibility.</td></tr>
<tr><td>FirmwareAuthRole</td><td>Object</td><td>True</td><td>A reference to the Role object defining Privileges for this Host Interface when using firmware authentication.
NOTE
This property has been deprecated in favor of newer methods of negotiating credentials. This property is</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td colspan="4">supported to allow Bios Backward Compactibility.</td></tr>
<tr><td>HostEthernetInterfaces</td><td>Object</td><td>True</td><td colspan="4">This is a reference to a collection of NICs that Computer Systems use for network communication with this Host Interface.</td></tr>
<tr><td>ManagerEthernetInterface</td><td>Object</td><td>True</td><td colspan="4">This is a reference to a single NIC that this Manager uses for network communication with this Host Interface.
NOTE
The BMC USB Ethernet Interfaces such as usb0 are populated under this property.</td></tr>
<tr><td>NetworkProtocol</td><td>Object</td><td>True</td><td colspan="4">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 ManagerNetworkProtocol.</td></tr>
<tr><td>AuthNoneRoleId</td><td>String</td><td>False</td><td colspan="4">The Role used when no authentication on this interface is used.</td></tr>
<tr><td rowspan="4">CredentialBootstrapping</td><td rowspan="4">Object</td><td rowspan="4">False</td><td colspan="4">The credential bootstrapping settings for this interface.</td></tr>
<tr><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>Enabled</td><td>Boolean</td><td>False</td><td>An indication of whether credential bootstrapping is enabled for this interface.</td></tr>
<tr><td>EnableAfterReset</td><td>Boolean</td><td>False</td><td>An indication of whether credential bootstrapping is enabled after a reset for this interface.</td></tr>
<tr><td></td><td></td><td></td><td>RoleId</td><td>String</td><td>False</td><td>The role used for the bootstrap account created for this interface.</td></tr>
</table>

PATCH

Request

```
https://{{ip}}/redfish/v1/Managers/{{system_instance}}/HostInterfaces/{{hostinterface_instance}}
Content-Type: application/json
```

Request Body

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

Response

The response status is success with status code as 204 and no body. For Detailed Error Response Format refer Section "Redfish Error Response" and Section "Status Codes".

5.3 Host Ethernet Interface Collection

This resource shall be used to represent the collection of host side Ethernet interfaces.

GET

Request

https://{{ip}}/redfish/v1/Managers/{{manager_instance}}/HostInterfaces//{{hostinterface_instance}}/HostEthernetInterfaces

Content-Type: application/json

Response

Please refer Section Collection for the JSON response properties.

Chapter 6. Redfish AMI OEM Entities

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.

GET

Request

```
GET https://{{ip}}/redfish/v1/Oem/Ami/Configurations
Content-Type: application/json
```

Table 179 Configuration Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource
CertificateAuthorityUrl	String	False	The URL for the web server where the CA certificate is stored.

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

PATCH

Request

```
PATCH https://{{ip}}/redfish/v1/Oem/Ami/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/Oem/Ami/Configurations
Content-Type: application/json
```

```
{
   "CertificateAuthorityUrl" :null
}
```

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 "Redfish Error Response" and Section "Status Codes".

6.2 PAM Configuration

GET

Request

```
GET https://{{ip}}/redfish/v1/AccountService/Oem/Ami/Configurations
Content-Type: application/json
```

Table 180 Account Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
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. When this property is enabled, the user name and password provided in basic authentication will use SPX PAM authentication feature by redfish service and the access is granted based on what privilege the PAM user has. The mapping of PAM user privilege to redfish roles are as follows. • PAM Callback privilege maps to Redfish ReadOnly role • PAM User privilege maps to Redfish ReadOnly role • PAM Operator privilege maps to Redfish Operator role • PAM Administrator privilege maps to Redfish Administrator role **NOTE** *Since there is no clear cut way of one to one mapping for PAM oem privilege to any of the redfish role, in the current redfish design, user having PAM oem privilege when tries to access redfish resource will return 401 - Unauthorized. But with CONFIG_SPX_FEATURE_OEM_PROPRIETARY_LEVEL_SU PPORT feature is enabled OEM privilege will have all admin rights and can able to access redfish APIs.*
PAMOrder	Array	False	Array that represents the order the PAM modules will be checked for authentication. Allowable values are {"ACTIVE DIRECTORY", "IPMI", "LDAP", "RADIUS"}. **NOTE** *PAMOrder can change only when PAMEnabled in true state.* *RADIUS should be kept as last in the PAMOrder.*

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

PATCH

Request

```
PATCH https://{{ip}}/redfish/v1/AccountService/Oem/Ami/Configurations
Content-Type: application/json
```

Example PATCH Request Body

```
{
   "PAMEnabled" : true, "PAMOrder" : [ "ACTIVE DIRECTORY" , "IPMI" , "LDAP" , "RADIUS" ]
}
```

Response

The response status is success by following scenario:

- If the PATCH is completely success without any extended information, status code will be 204.
- A message will be included in the response when the lighttpd web server needs to be restarted and if there is some extended info.

On error, the response status will be 400 and the body will contain the response error.

For Detailed Error Response Format refer Section "Redfish Error Response" and Section "Status Codes".

6.3 Memory Action

State of any Memory instance can be changed by this API. DIMM's can be either enabled or disabled.

POST

Request

```
POSThttps://{{ip}}/redfish/v1/Systems/{{Systems_instance}}/Memory/{{memory_instance}}/Actions/
AmiBios.ChangeState
Content-Type: application/json
```

Example POST Request Body

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

Response

The response of the request will be 204 No content.

6.4 PCIe Functions Instance Action

State of any PCIeDevice instance can be changed by this API.

POST

Request

POSThttps://{{ip}}/redfish/v1/Chassis/Self/PCIeDevices/{{PCIeDevices_instance}}/PCIeFunctions/{{PCIeFunctions_instance}}Actions/AmiBios.ChangeState

Content-Type: application/json

Example POST Request Body

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

Response

The response of the request will be 204 No content.

6.5 Manager RedfishPowerSaveModeAction

PowerSaveMode is spx-feature which is used to disable USB-Interfaces - When power save is on USB Interfaces will be disabled.
In CRB Bios will issue the ipmi call through KCS to disable PowerSave so that Bios cannot communicate with BMC-Redfish(Hi-Communication)
Since SPX-13(2600) don't have KCS interface between BIOS and BMC we have to disable PowerSave Mode manually so that Bios BMC communication works.
For this we have implemented PowerSave Mode- enable, disable function using Redfish API action.

POST

Request

POST https://{{ip}}/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIManager.RedfishPowerSaveMode

Content-Type: application/json

Example POST Request Body

```
{
   "PowerSaveMode" : "Disable"
}
```

Response

The response status code should be 204.

```
{
}
```

6.6 Manager Configure CD Instance 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 4, as per the PRJ configuration. The CDInstance values ranges from zero to four.

POST

Request

```
POST
https://{{ip}}/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIVirtualMedia.ConfigureCDInstance
Content-Type: application/json
```

Example POST Request Body

```
{
        "CDInstance" : 4
}
```

Response

The reponse status code should be 200 with the below message in the response.

```
{
   "error" : {
      "@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"
        }
      ],
      "code" : "Ami.1.0.DelayInActionCompletion" ,
      "message": "ConfigureCDInstance action has been initiated successfully. Please allow up to 4-5 secs and verify the value of CDInstances OEM property in /redfish/v1/Managers/Self instance"
   }
}
```

6.7 Manager Enable RMedia 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.

POST

Request

```
POST
https://{{ip}}/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIVirtualMedia.EnableRMedia

Content-Type: application/json
```

Example POST Request Body

```
{
        "RMediaState" : "Enable"
}
```

Response

The reponse status code should be 200 with the below message in the response.

```
{
   "error": {
        "@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"
          }
        ],
        "code" : "Ami.1.0.DelayInActionCompletion" ,
        "message": "EnableRMedia action has been initiated successfully. Please allow up to 4-5 secs and verify the value of RMediaStatus OEM property in /redfish/v1/Managers/Self instance"
   }
}
```

6.8 Manager BackupConfig Action

This OEM action is used to take a backup of BMC configurations.
bmc-config.bak file will be downloaded while performing this POST action in Postman application using ‘’Send and Download’’ option.
The list of BMC configuration that can be backed up are mentioned below.

- "SNMP",
- "Syslog",
- "KVM",
- "NTP",
- "IPMI",
- "Network and Services",
- "Authentication"

NOTE
Currently this feature in Redfish supports to back up the BMC configuration which can be configured through WebUI.
The syslog configuration cannot be set through Redfish, which should be configured through WebUI only.
Authentication feature includes LDAP , AD and RADIUS configurations in BMC.
If the client restores the backup configuration using the Redfish/WebUI, all IPMI user passwords, including the 'Administrator' user, will be reset to the default IPMI password for security reasons. This change is synchronized with the Redfish (unified account feature). After restoring the configuration, users must reset their passwords using the default IPMI password.

POST

Choose "Send and Download" option in postman tool to download bmc-config.bak file.
Save the bmc-config.bak file in your local machine.

Request

```
POST https://{{ip}}
/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIVirtualMedia.EnableRMedia
Content-Type: application/json
```

Example POST Request Body

```
{
   "BackupFeatures":[
            "Network and Services",
            "Syslog",
            "KVM",
            "IPMI",
            "Authentication",
            "NTP",
            "SNMP"
   ]
}
```

Response

bmc-config.bak file will be downloaded in your local machine.

6.9 Manager RestoreConfig Action

This OEM action is used to restore the BMC configurations by uploading the bmc-config.bak file which was downloaded using BackupConfig action.

POST

Request

POST https://{{ip}}/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIManager.RestoreConfig

Content-Type: form-data

Key: conf_file

File:<file>

Response

The response status is 204.

6.10 Manager OEM Properties

The AMI implement Oem property contained within the "Ami" json object.
The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

GET

Request

GET https://{{ip}}/redfish/v1/Managers/Self

Content-Type: application/json

Table 181 Managers Self OEM properties

Name	**Type**	**Read Only**	**Description**			
VirtualMedia	Object	True	Name	Type	Read Only	Description
			@odata.type	String	True	Refer Section ODATA Properties
			CDInstances	Number	True	Specifies the number of CD instances allowed for redirection
			RMediaStatus	String	True	Specifies the current status of RMedia settings
ManagerServiceInfo	Object	True	Name	Type	Read Only	Description
			CommandShellServiceInfo	Object	True	The property contains object related to CommandShell service. Refer Table Manager OEM table for ManagerServiceInfo

						CommandShellServiceI nfo OEM extended properties detail
			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. Refer Table Manager OEM table for ManagerServiceInfo CommandShellServiceInfo OEM extended properties detail
PowerSaveM ode	String	True	The PowerSave mode is used to disable USB-Interfaces –When power save is on USB ifaces will be disabled.			

Table 182 Manager OEM table for ManagerServiceInfo CommandShellServiceInfo OEM extended properties detail

Name	**Type**	**Read Only**	**Description**			
CommandShel lServiceInfo	Array	True	Name	Type	Read Only	Description
			IPMI	Object	True	The property contains object that contains property MaxConcurrenceSession of protocol IPMI.
			SSH	Object	True	The property contains object that contains property MaxConcurrenceSession of protocol SSH. **NOTE** *This property will not be displayed in the response, if the value from back-end is not applicable.*

Table 183 Manager OEM table for ManagerServiceInfo Links OEM extended properties

Name	**Type**	**Read Only**	**Description**
NetworkProtocol	Object	True	The property contains an URI related to NetworkProtocol resource, ‘’/redfish/v1/Managers/{{system_instance}}/Network Protocol.’’

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

6.11 CertificateCollection OEM properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

POST [Creating new Certificate]

Request

```
POST https://{{ip}} /redfish/v1/Systems/{ComputerSystemId}/Boot/Certificates
Content-Type: application/json
```

Table 184 CertificateCollection Self OEM properties

Name	Type	Description
OwnerGuid	String	Refer Table Resource Complex Types under Section Resource in this document. **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.* **NOTE** *The Boot Certificate setting refers to the following example (Post Request Body for Boot Certificate).* **NOTE** *OwnerGuid is case-insensitive. It always displays in uppercase in response body.*

Example POST Request Body for Boot Certificate:

```
{
"CertificateString" : ------BEGIN CERTIFICATE-----
\nMIIC2DCCAoICCQDrKFHkCkpC2zANBgkqhkiG9w0BAQsFADCB8jELMAkGA1UEBhMC\nVVMxD
zANBgNVBAgMBk9yZWdvbjERMA8GA1UEBwwIUG9ydGxhbmQxEDAOBgNVBAoM\nB0NvbnRvc28x
DDAKBgNVBAsMA0FCQzEcMBoGA1UEAwwTbWFuYWdlci5jb250b3Nv\nLm9yZzEgMB4GCSqGSIb3
DQEJARYRYWRtaW5AY29udG9zby5vcmcxGjAYBgNVBCkM\nEXRlc3RDb250YWN0UGVyc29uMRYw
FAYDVQQqDA10ZXN0R2l2ZW5OYW1IMRUwEwYD\nVQQrDAx0ZXN0SW5pdGlhbHMxFDASBgNV
BAQMC3Rlc3RTdXJuYW1IMB4XDTE5MTIx\nOTAyNTg0NVoXDTIwMDExODAyNTg0NVowgfIxCzA
JBgNVBAYTAlVTMQ8wDQYDVQQI\nDAZPcmVnb24xETAPBgNVBAcMCFBvcnRsYW5kMRAwDgYD
VQQKDAdDb250b3NvMQww\nCgYDVQQLDANBQkMxHDAaBgNVBAMME21hbmFnZXIuY29udG9
zby5vcmcxIDAeBgkq\nhkiG9w0BCQEWEWFkbWluQGNvbnRvc28ub3JnMRowGAYDVQQpDBF0ZXN0
Q29udGFj\ndFBlcnNvbjEWMBQGA1UEKgwNdGVzdEdpdmVuTmFtZTEVMBMGA1UEKwwMdGVzdE
lu\naXRpYWxzMRQwEgYDVQQEDAt0ZXN0U3VybmFtZTBcMA0GCSqGSIb3DQEBAQUAA0sA\nMEg
CQQC2vTAZtvPrByReb065z6E/n7Rv8ymt4Goowjet6s0kfm/WnJumTt0/eJfk\n2j5c+XSg6q1wgmZOZ
A+NZVL7DFUjAgMBAAEwDQYJKoZIhvcNAQELBQADQQCsYyRY\n3RX7fsLQr0M/LgHCHF9ke9mF8Ks
ockAQlZLkXuwSZHe6+0b7p6OeWrdiuil6cpmO\nb32QIGFrKWq8JXD+\n-----END CERTIFICATE-----\n---
--BEGIN PRIVATE KEY-----
\nMIIBVgIBADANBgkqhkiG9w0BAQEFAASCAUAwggE8AgEAAkEAtr0wGbbz6wckXm9O\nuc+hP5+0b
/MpreBqKMI3rerNJH5v1pybpk7dP3iX5No+XPl0oOqtcIJmTmQPjWVS\n+wxVIwIDAQABAkEAn6j0Wc
NLolF/KTM/KYGLdTdoQ1fFVrH4jtwCIeZAjlygCliT\nKcb1AosO/jxKFaK/ZUUVk5lWomxnZBy641r+AQI
hANpX0+K7kUUm4L7x1VgFfRUh\nal8ns1MneAkbL0z0j+NjAiEA1kFjSAJIki1fkakXtixdiZz9GdRbgLBF
M4cZJXtT\n00ECIQCNkCIdwBTI7BMNWghD4JmfryGjfj8DK/Tkmo6Ja4sbFwlhAKF1FwcNyXh2\nvt06
qsa6uiZY6pbLY8UfkJabCUUooevBAiAzw38GApvYqlQeSRQcHTMx/LN6a6NY\nJlxeaUXwCcsIuw==\n-
----END PRIVATE KEY-----\n",
    "CertificateType" : "PEM"
```

```
"Oem" :
{
  "Ami" :
  {
    "OwnerGuid" : "FE9C6606-8B49-44A3-8B6B-DEA3A0E0324D"
  }
}
```

Response

The response status is 201 and the response body is a GET Response with the properties of the newly created Certificate.

6.12 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.

GET

Request

```
GET https://{{ip} /redfish/v1/Oem/Ami/InventoryData/Status
Content-Type: application/json
```

Response

The response of the request will be 200 OK with response body.

Table 185 InventoryData Status properties

Name	Type	Read Only	Description			
@odata.context	String	True	Refer Section ODATA Properties			
@odata.id	String	True	Refer Section ODATA Properties			
@odata.type	String	True	Refer Section ODATA Properties			
@odata.etag	String	True	Refer Section ODATA Properties			
Id	String	True	Resource Identifier			
Name	String	True	Name of the Resource			
Description	String	True	Provides description of the resource. Refer Section Resource.			
InventoryData	Object	True	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. **NOTE** *Refer table given below for*

						different types of messages.
			ProcessingTime	Number	True	This is the time taken to process and populate the Inventory file. Unit : milliseconds
			LastModified Time	String	True	This property shall indicate the date and time when the InventoryData is updated. *Format: date-time*
			Status	String	True	Specifies the status of inventory file processing.

Table 186 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, PCIeDevices, NetworkInterfaces, NetworkAdapters.
CERTIFICATES	This element corresponds to all data related to Boot Certificates
SECURBOOT	This element corresponds to all data related to SecureBoot data.

Table 187 Enum values for Status

Enum	Description
BootInProgress	This signifies that Host systems has started booting
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.

Table 188 Types of Messages in InventoryDataStatus URI

Enum	Description
Warning	- This message signifies that some mandatory property under a particular resource is missing because of this population of this resource maybe skipped. - The message with show which property is missing and the Collection under which the error has happened. - Example: *"Warning PropertyMissing (Id : Skipping Further operations under Redfish:Chassis:Self:NetworkAdapters"* ; here message signifies that the Id property is missing under one of the Chassis Instance, - Exception: If Id is missing under Chassis and System Instances, InventoryProcessing mechanism will assume the default Id for the instance and will populate all properties under it.
Error	- This error signifies any unexpected error occurred during population of some resources. - Example: *"Error while populating SubProcessors data under Redfish:Chassis:Self:NetworkAdapters"* ; here the message signifies that the an unexpected error occurred while processing the NetworkAdapter instance. When this error is encountered and if the redfish debug is enabled, details of the error will be printed in BMC Serial Console.

	- Example 2: "*Error: backuping inventory file failed",* this message signifies that the backup function is facing some unexpected error while updating backup file. - Example 3: "*Error: file format not supported (Not a json File)",* this message signifies that Inventory file posted to BMC is not a valid json file. - Example 4: "*Error reading extracted file",* this message signifies that an unexpected error occurred while reading the inventory file.
BiosAttributeRegistryRelated	- Processed Successfully : This message signifies that the particular BiosAttributeRegistry is processed successfully and readable files are created. This message is expected only when the inventory files is having BiosAttributeRegistry data in it. Example *: "BiosAttributeRegistry0ACOR.en-US.0.30.0.json Processed Successfully"* - Error while populating : This message signifies that an unexpected error has occurred while populating the BiosAttributeRegistry data. Example : "*Error while populating BiosAttributeRegistry data"* - Conf area almost full : This message signifies that some data is skipped as conf are of BMC is almost full. This message is followed by a Log: showing which data is skipped. Example : *"Warning: CONF area is almost full (95%)"* *"Log : BiosAttributeRegistry0ACOR.en-US.0.30.0.json skipped due to insufficient storage"* - Error Invalid name : This message signifies that the file name of the BiosAttributeRegistry is not matching the predefined format. Example : "*Error: Invalid FileName (BiosAttributeRegistry0ACOR.json)"*
Generic	1. *"Inventory Backup file updated successfully."* , this message signifies that inventory data backup file is updated successfully 2. *"Log:ProcessingTime not captured as system datetime got updated"* , this message signifies that the Processing time is not captured as the BMC system datetime is modified in between the processing.
Oem	Apart from the above given message types Oem extensions can include any type of strings to messages using OemExtensions.

6.13 AccountService LDAP OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

GET

Request

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

Content-Type: application/json

Table 189 Account Service LDAP Authentication OEM Properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section ODATA Properties
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''.*

Table 190 Account Service LDAP RemoteRoleMapping OEM Properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section ODATA Properties
RoleID	Number	True	ID of particular role in RoleMapping
KVMAccess	Boolean	False	Status of KVM access of the particular role in RoleMapping
VMediaAccess	Boolean	False	Status of VMedia access of the particular role in RoleMapping

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

PATCH

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"
            ],
            "UsernameAttribute" : "cn"
         }
      },
      "ServiceAddresses" : [
         "10.0.122.61:389"
      ],
      "ServiceEnabled" : true
   }
}
```

Example PATCH Request Body - RoleMapping

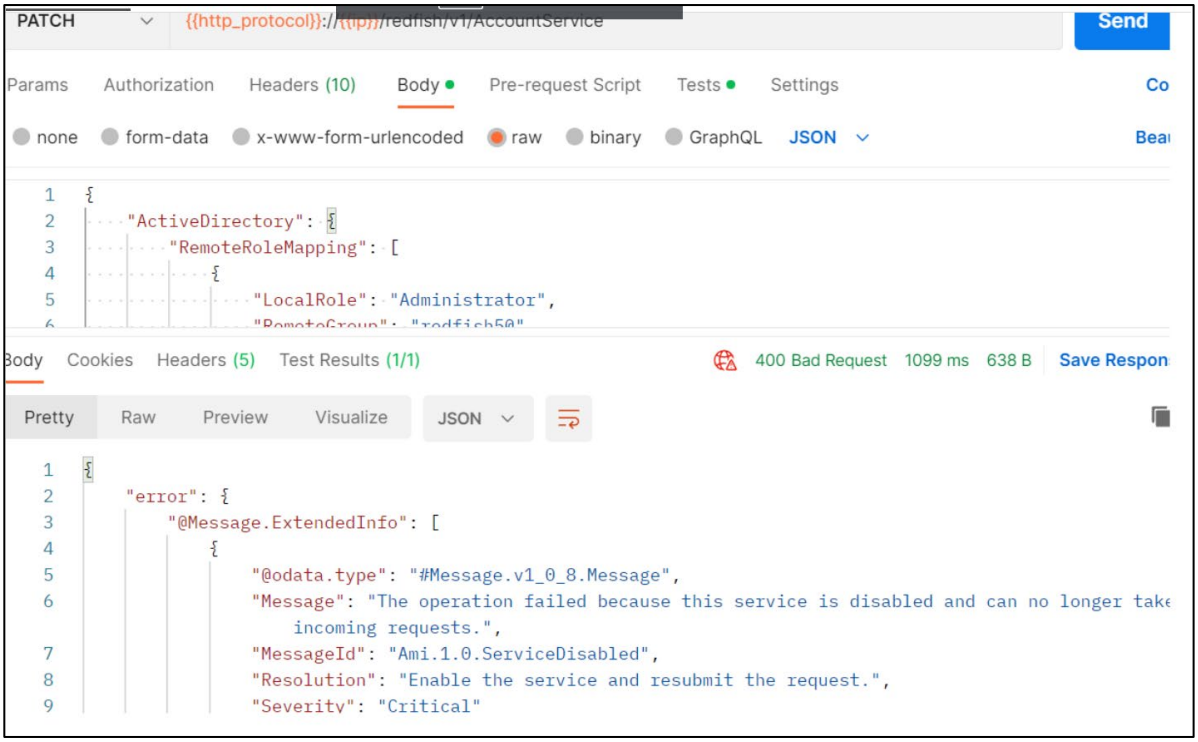
```
{
   "LDAP" : {
      "RemoteRoleMapping" : [
      {
         "LocalRole" : "Administrator" ,
         "RemoteGroup" : "redfish4" ,
         "RemoteUser" : "Active2" ,
         "Oem" :{
            "Ami" :{
                  "KVMAccess" : true ,
                  "VMediaAccess" : true
            }
         }
      }]
   }
}
```

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"
        ],
        "UsernameAttribute" : "cn"
      }
    },
    "ServiceAddresses" : [
      "10.0.122.61:389"
    ],
    "ServiceEnabled" : true
  }
}
```

NOTE
If patch is applied for RoleMapping before serive enabled or before Authentication will get ServiceDisabled error.



6.13 AccountService ActiveDirectory OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

GET

Request

```
GET https://{{ip}}/redfish/v1/AccountService
Content-Type: application/json
```

Table 191 Account Service Active Directory Authentication OEM Properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section ODATA Properties
DomainName	String	False	Specify the Domain Name for the user
DomainControllerServerAddr1	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.
DomainControllerServerAddr2	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.
DomainControllerServerAddr3	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.

Table 192 Account Service Active Directory RemoteRoleMapping OEM Properties

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section ODATA Properties
GroupID	String	True	GroupID of the five available roles in RoleMapping
KVMAccess	Boolean	False	Status of KVM access of the particular role in RoleMapping
VMediaAccess	Boolean	False	Status of VMedia access of the particular role in RoleMapping

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

PATCH

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" :true
   }
}
```

Example PATCH Request Body - RoleMapping

```
{
   "ActiveDirectory" : {
      "RemoteRoleMapping" : [
      {
         "LocalRole" : "Administrator" ,
         "RemoteGroup" : "redfish4" ,
         "RemoteUser" : "Active2" ,
         "Oem" :{
            "Ami" :{
                  "KVMAccess" : true ,
                  "VMediaAccess" : true
            }
      }]
   }
}
```

6.15 Systems BiosTable

GET

Request

```
GET https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Oem/Ami/BiosTable
Content-Type: application/json
```

Table 193: Systems BiosTable Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Id	String	True	Resource Identifier
Name	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section Resource
FileContent	String	True	This property shall contains the file content of the file posted to this URI.

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

POST

Request

```
PATCH https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Oem/Ami/BiosTable
Content-Type: form-data
Key:BIOSTableFile
File:<file>
```

Response

The reponse status code should be 201.

DELETE

Request

```
DELETE https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Oem/Ami/BiosTable
```

Response

The reponse status code should be 204.

6.16 Systems BiosTable Tags

GET

Request

```
GET https://{{ip}}/redfish/v1/Systems/Self/Oem/Ami/BiosTableTags
Content-Type: application/json
```

Table 194 Systems BiosTable Property

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Id	String	True	Resource Identifier
Name	String	True	Name of the Resource
Description	String	True	Provides description of the resource. Refer Section Resource
TableTags	Array of Objects	True	This property shall contain the list of tabletags.

Name	Type	Read Only	Description
TableType	String	True	TableType for this TableTag
Value	Number	True	Value for this TableTag

NumberOfTables	Number	True	This property shall contain the number tables present.

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

POST

Request

```
PATCH https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Oem/Ami/BiosTableTags
Content-Type: application/json
```

Example PATCH Request Body

```
{
        "TableTags" : [
                { "TableType" : "1" , "Value" :20001},
                { "TableType" : "2" , "Value" :30001}
        ],
        "NumberOfTables" :2
}
```

Response

The reponse status code should be 204.

DELETE

Request

```
DELETE https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Oem/Ami/BiosTableTags
```

Response

The reponse status code should be 204.

6.17 Systems OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

GET

Request

```
GET https://{{ip}}/redfish/v1/Systems/Self
Content-Type: application/json
```

Table 195 Systems Self OEM properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="5">ManagerBoot Configuration</td><td rowspan="5">Object</td><td rowspan="5">False</td><td>Indicates the properties related to ManagerBoot.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="4">ManagerBootMode</td><td rowspan="4">String</td><td rowspan="4">False</td><td>This property shall specify the enum supported by ManagerBootMode.
<table>
<tr><th>Enum</th><th>Description</th></tr>
<tr><td>None</td><td>The default value for ManagerBootMode</td></tr>
<tr><td>SoftReset</td><td>The SoftReset is pushbutton reset /soft-reset without valid bit clean(Ctrl-Alt-Del)</td></tr>
<tr><td>ResetTimeout</td><td>ResetTimeout support is Boot Option</td></tr>
</table></td></tr>
<tr><td>ManagerBootMode @Redfish.AllowableValues</td><td>Array</td><td>True</td><td>This attribute will list the allowed enum values(i.e. SoftReset and ResetTimeout) for the SupportedCollectionFunctions attribute.</td></tr>
</table></td></tr>
<tr><td rowspan="4">Bios</td><td rowspan="4">Object</td><td rowspan="4">True</td><td>Indicates that the properties under this object is related to Bios
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>BiosTable</td><td>Object</td><td>True</td><td>Reference to BiosTable URI
NOTE
Only visible if the BiosTable is already posted by BIOS</td></tr>
<tr><td>BiosTableTags</td><td>Object</td><td>True</td><td>Reference to BiosTableTags URI
NOTE
Only visible if the BiosTableTags is already posted by BIOS</td></tr>
<tr><td>Inventory</td><td>Object</td><td>True</td><td>Reference to InventoryCrc URI</td></tr>
</table></td></tr>
</table>

						along with GroupCrc information is displayed under this object. **NOTE** • *This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information).* • *Refer Systems InventoryCrc section for more details on the resource object.*
			RedfishVersion	String	True	Shows the Bios Redfish version. **NOTE** *This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information).*
			RtpVersion	String	True	Shows the Bios RTP version. **NOTE** *This property is populated by Host Interface as part of Inventory. (Extra Bios Support is needed. Refer Section Redfish Inventory Support for detailed information).*

PATCH

Request

```
PATCH https://{{ip}}/redfish/v1/Systems/Self
Content-Type: application/json
```

Example PATCH Request Body- SoftReset or ResetTimeout

```
{
        "Oem" : {
                "AMI" : {
                        "ManagerBootConfiguration" : {
                                "ManagerBootMode" : "SoftReset"
                        }
                }
        }
}
```

6.18 Storage Instance OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

GET

Request

```
GET https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Storage/{{storage_instance}}
Content-Type: application/json
```

Table 196 Systems Self OEM Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="5">StorageController Sensors</td><td rowspan="5">Array</td><td rowspan="5">True</td><td>Indicates the properties related to set of storage controller sensors.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>Reading</td><td>Number</td><td>True</td><td>Indicates the reading of the StorageControllerSensor</td></tr>
<tr><td>Reading Type</td><td>String</td><td>True</td><td>Indicates the reading type of the StorageControllerSensor</td></tr>
<tr><td>Reading Unit</td><td>String</td><td>True</td><td>Indicates the reading unit of the StorageControllerSensor</td></tr>
</table>
</td></tr>
</table>

6.19 Systems InventoryCrc

GET

Request

```
GET https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Oem/Ami/Inventory/Crc
Content-Type: application/json
```

Table 197 Systems InventoryCrc Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Id	String	True	Resource Identifier
Name	String	True	True Name of the Resource
GroupCrcList	Array of Objects	True	This property shall contain the list of Crc elements an it's corresponding values. Refer the below table for the allowed CRC elements and its description

Table 198 Allowed Group Crc Elements

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, PCIeDevices, NetworkInterfaces, and NetworkAdapters.
CERTIFICATES	This element corresponds to all data related to Boot Certificates.
SECURBOOT	This element corresponds to all data related to SecureBoot data.

POST

Request

```
POST https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Oem/Ami/Inventory/Crc
Content-Type: application/json
```

Example POST Request Body

```
{
   "GroupCrcList" : [
      {
         "PCIE" : 0
      },
      {
         "DIMM" : 0
      }
   ]
}
```

DELETE

Request

```
DELETE https://{{ip}}/redfish/v1/Systems/{{system_instance}}/Oem/Ami/Inventory/Crc
```

6.20 Secondary SMTP OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

PATCH [Configuring Secondary SMTP Server]

Request

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

Table 199 Secondary SMTP OEM Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="4">Secondary SMTP</td><td rowspan="4">Object</td><td rowspan="4">True</td><td>Set of properties contain parameters for the SMTP (Simple Mail Transfer Protocol) service.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>Authentication</td><td>String</td><td>False</td><td>Property will contain Authentication methods for Secondary SMTP service.
“Plain” and “None” are avaliable as options. None is no Authentication with SMTP Server and Plain is basic Authentication with SMTP Server.Setting this property to “None” will not delete the “Username” and “Password” Parameters.</td></tr>
<tr><td>ConnectionProtocol</td><td>String</td><td>false</td><td>Propery Contains Connection Protocols for Secondary SMTP service.
“None” , “StartTLS” , and “TLS_SSL” are possible options.</td></tr>
<tr><td>FromAddress</td><td>String</td><td>false</td><td>Property Contains The Sender’s Address for the Secondary SMTP service.
This can be a valid email address.
If FromAddress is set in Web, the FromAddress input will be set for both Primary and Secondary. If Primary OR Secondary FromAddress is set in Redfish the Web entry will be updated.
If Primary AND Secondary are set</td></tr>
</table></td></tr>
</table>

						in Redfish, Primary FromAddress will be set to Web.
			Password	String	false	Property Contains the password if ‘‘Authentication’’ property in Secondary SMTP service is ‘‘Plain’’. This will be displayed as ‘‘null’’ for security reasons, but the values will be saved in the backend. When Authentication is set to ‘‘None’’, the value will still exist in backend.
			Port	Number	false	Property contains the Destination Port number for the Secondary SMTP service. Secureport and Smtpport, avaliable in the IPMI/Web counterpart, are hidden following DMTF spec. By Default Secureport is 465 and Smtpport is 25. If a PATCH command is set with ‘‘ConnectionProtocol ‘‘as ‘‘TLS_SSL’’ then the SecurePort is changed when ‘‘Port’’ parameter is changed. If the PATCH is called when ‘‘ConnectionProtocol’’ is ‘‘StartTLS’’ or ‘‘None’’, the ‘‘Port’’ parameter changes the Smtpport value. The "Port" parameter has a value range of 0 to 65535, except for ports 0, 20, 21, 22, 23, 80, 161, 443, and 546.
			ServerAddress	String	false	Property Contains the Server Address for the Secondary SMTP service. This can be in IPv4 or IPv6 format.
			ServiceEnabled	Boolean	false	Property controls wheter or not the Secondary SMTP service is enabled or disabled.
			Username	String	false	Property Contains the username if ‘‘Authentication’’ property in ‘‘SMTP’’ service is ‘‘Plain’’. When Authentication is set to ‘‘None’’, the value will still exist in backend.

Example PATCH Request Body for Secondary:

```
{
   "Oem" :
   {
      "Ami" :
      {
      "SecondarySMTP" : {
         "Username" : "TestUser" ,
         "Password" : "admin234" ,
         "ServiceEnabled" : true,
         "ServerAddress" : 172.31.1.23,
         "Port" : 25,
         "FromAddress" : "testuser@test.com" ,
         "Authentication" : "Plain" ,
         "ConnectionProtocol" : "None"
         }
      }
   }
}
```

Response

The response status is 201. Doing a GET in https://{{ip}}/redfish/v1/EventService will bring up the values.

6.21 SMTP Certificate OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

POST [Adding Certificates for StartTLS Connection Protocol SMTP]

Request

```
POST https://{{ip}}/redfish/v1/EventService/Oem/Ami/SMTP/Certificates
```

Table 200 CertificateCollection Self OEM Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="5">PrimarySMTP</td><td rowspan="5">Object</td><td rowspan="5">False</td><td colspan="4">Set of properties contain parameters for the SMTP (Simple Mail Transfer Protocol) Certificates needed for StartTLS.</td></tr>
<tr><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>CACert</td><td>String</td><td>false</td><td>Property will Contain the CA Certificate key for SMTP.
NOTE
The string size is limited under 5000 bytes.</td></tr>
<tr><td>Cert</td><td>String</td><td>false</td><td>Property will Contain the Client Certificate key for SMTP.
NOTE
The string size is limited under 5000 bytes.</td></tr>
<tr><td>PrivateKey</td><td>String</td><td>false</td><td>Property will Contain the Private Certificate key for SMTP. This will not be Displayed When doing a GET.
NOTE
The string size is limited under 5000 bytes.</td></tr>
<tr><td rowspan="5">Secondary SMTP</td><td rowspan="5">Object</td><td rowspan="5">False</td><td colspan="4">Set of properties contain parameters for the Secondary SMTP (Simple Mail Transfer Protocol) Certificates needed for StartTLS.</td></tr>
<tr><td>Name</td><td>Type</td><td>Read Only</td><td>Description</td></tr>
<tr><td>CACert</td><td>String</td><td>false</td><td>Property will Contain the CA Certificate key for Secondary SMTP.
NOTE
The string size is limited under 5000 bytes.</td></tr>
<tr><td>Cert</td><td>String</td><td>false</td><td>Property will Contain the Client Certificate key for Secondary SMTP.
NOTE
The string size is limited under 5000 bytes.</td></tr>
<tr><td>PrivateKey</td><td>String</td><td>false</td><td>Property will Contain the Private Certificate key for Secondary</td></tr>
</table>

						SMTP. This will not be displayed when doing a GET. **NOTE** *The string size is limited under 5000 bytes.*

Example POST Request Body for Primary SMTP StartTLS Certificate:

```
{
    "PrimarySMTP" : {
        "CACert" : "-----BEGIN CERTIFICATE-----ayyy
                Ccccccccccccccccccccccccccccccccccccccccccccccccccccccc
                ccccccccccccccccccccccccccccccccccccccccccccccccccc==
                    -----END CERTIFICATE-----",

        "Cert" : "-----BEGIN CERTIFICATE-----bbbbbb
                bbbbbbbbbbbbbbbbbbbbbbbbbbbbb
                bbbbbbbbbbbbbbbbbbbbbbbbbbbbb==
                    -----END CERTIFICATE-----",

                "PrivateKey" : "-----BEGIN RSA PRIVATE KEY-----
                        aaaaaaaaaaaaaaaaaaaaaaaaaaaa
            aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
            aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
        aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
        aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
            -----END RSA PRIVATE KEY-----"
    }
}
```

Example POST Request Body for Secondary SMTP StartTLS Certificate:

```
{
    "'SecondarySMTP" : {
        "CACert" : "-----BEGIN CERTIFICATE-----ayyy
                yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy
                yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy==
                    -----END CERTIFICATE-----",

        "Cert" : "-----BEGIN CERTIFICATE-----yyyyyyyyy
                yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy
                yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy==
                    -----END CERTIFICATE-----",

        "PrivateKey" : "-----BEGIN RSA PRIVATE KEY-----888888888888888888888
                99999999999999999999999999999999999999999999999999999999999
                55555555555555555555555555555555555555555555555555555555555
                33333333333333333333333333333333333333333333333333333333333
                -----END RSA PRIVATE KEY-----"
    }
}
```

Response

The response status is 201 and the response body is a GET Response with the properties of the newly created Certificate.

GET [GET SMTP Certificates Collection]

Example GET Request Body for Primary SMTP StartTLS Certificate:

Request

```
https://redfish/v1/EventService/Oem/Ami/SMTP/Certificates
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.
Please refer the sample response below. This will get the info on all certificates that has been put in using the POST API.

```
{
    ...
   "Members" : [
      {
         "@odata.id" : "/redfish/v1/EventService/Oem/Ami/SMTP/Certificates/1"
      },
      {
         "@odata.id" : "/redfish/v1/EventService/Oem/Ami/SMTP/Certificates/2"
      }
    ],
    "Certificates@odata.count" : 2,
    "Description" : "Collection for SMTP Certificate Collection" ,
    "Name" : "SMTP Certificate Collection"
}
```

GET [GET SMTP Certificates]

Example GET Request Body for Primary SMTP StartTLS Certificate:

Request

```
https://redfish/v1/EventService/Oem/Ami/SMTP/Certificates/1
Content-Type: application/json
```

Response

The response of the request will return 200 with response body in JSON format with the OData properties.
Please refer the sample response below. This will get the PrimarySMTP certificate info that has been put in using the POST API.

```
{
    ...
   "PrimarySMTP" : {
            "CACert" :" -----BEGIN CERTIFICATE-----ayyy
                    Ccccccccccccccccccccccccccccccccccccccccccccccccccccc
                    ccccccccccccccccccccccccccccccccccccccccccccccccccc==
                            -----END CERTIFICATE-----"

            "Cert" : "-----BEGIN CERTIFICATE-----bbbbbb
                    bbbbbbbbbbbbbbbbbbbbbbbbbbbbb
                    bbbbbbbbbbbbbbbbbbbbbbbbbbbbb==
                            -----END CERTIFICATE-----"
   }
}
```

NOTE
Private key wouldn t be part of GET Response

Example GET Request Body for Secondary SMTP StartTLS Certificate:

Request

```
https://{{ip}}/redfish/v1/EventService/Oem/Ami/SMTP/Certificates/2
Content-Type: application/json
```

Response

The response of the request will return 200 with response body in JSON format with the OData properties.
Please refer the sample response below. This will get the SecondarySMTP certificate info that has been put in using the POST API.

```
{
    …
   "SecondarySMTP" : {
            "CACert" : "-----BEGIN CERTIFICATE-----ayyy
                  Ccccccccccccccccccccccccccccccccccccccccccccccccccccc
                  ccccccccccccccccccccccccccccccccccccccccccccccccc==
                        -----END CERTIFICATE-----"

            "Cert" : "-----BEGIN CERTIFICATE-----bbbbbb
                  bbbbbbbbbbbbbbbbbbbbbbbbbbbbb
                  bbbbbbbbbbbbbbbbbbbbbbbbbbbbb==
                        -----END CERTIFICATE-----"
   }
}
```

NOTE
Private key wouldn t be part of GET Response

DELETE [DELETE SMTP Certificates]

Example of DELETE for Primary SMTP StartTLS Certificate:

Request

```
https://{{ip}}/redfish/v1/EventService/Oem/Ami/SMTP/Certificates/1
Content-Type: application/json
```

Response

The response status code should be 204.

Example of DELETE for Secondary SMTP StartTLS Certificate:

Request

```
https://{{ip}}/redfish/v1/EventService/Oem/Ami/SMTP/Certificates/2
Content-Type: application/json
```

Response

The response status code should be 204.

6.22 UpdateService OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

GET

Request

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

Content-Type: application/json

Response

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

Table 201 UpdateService OEM Properties

Name	Type	Read Only	Description
BMC	Object	True	Set of properties contain parameters for the information of BMC image

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section ODATA Properties
DualImageConfiguration	Object	True	The json object is used to indicate the DualImageConfiguration

Table 202 DualImageConfiguration Properties

Name	Type	Read Only	Description
DualImageConfiguration	Object	True	Set of properties contain parameters for the information of BMC DaulImageConfiguration.

Name	Type	Read Only	Description
ActiveImage	String	True	Refer Section ODATA Properties
BootImage	Object	True	Represents the image to which BMC boots.
FirmwareImage1Name	String	True	The name of BMC first firmware image
Firmwareimage1Version	String	True	The version of BMC first firmware image
Firmwareimage2Name	String	True	The name of BMC second firmware image
Firmwareimage2Version	String	True	The version of BMC second firmware image

6.23 Power OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according the clause from dmtf redfish spec (DSP0266) OEM property format and content.

GET

Request

```
GET https://{{ip}}/redfish/v1/Chassis/{{chassis_instance}}/Power
Content-Type: application/json
```

Table 202 DualImageConfiguration Properties

Name	Type	Read Only	Description			
			Name	Type	Read Only	Description
			@odata.type	String	True	Refer Section ODATA Properties
Ami	Object	True	OwnerLUN	Number	True	This is an OEM attribute and is a specific implementation of AMI. This property shall specify the LUN number of a Temperature/Fan/Voltage Sensor.

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

6.24 Thermal OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

GET

Request

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

Content-Type: application/json

Table 204 Thermal OEM properties

Name	Type	Read Only	Description			
Ami	Object	True	Name	Type	Read Only	Description
			@odata.type	String	True	Refer Section ODATA Properties
			OwnerLUN	Number	True	This is an OEM attribute and is a specific implementation of AMI. This property shall specify the LUN number of a Temperature/Fan/Voltage Sensor.

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

6.25 AdvancedRADIUSSetting

GET

Request

https://{{ip}}/redfish/v1/AccountService/ExternalAccountProviders/RADIUS/Oem/Ami/AdvancedRADIUSSetting

Content-Type: application/json

Table 205 AMIAdvancedRADIUSSettings properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
RADIUSAuthorization	Object	false	This object shall contain details of the Privilege levels and associated 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.

Id(M)	String	True	Resource Identifier
Name(M)	String	True	Name of the Resource

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'' ,
  "Id": "AdvancedRADIUSSetting",
  "Name": "Advanced RADIUS Setting"
```

```
   "RADIUSAuthorization" : {
      "Administrator" : "H=4" ,
      "NoAccess" : "H=0" ,
      "Oem" : "H=1" ,
      "Operator" : "H=3" ,
      "User" : "H=2"
   }
}
```

PATCH

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"
    }
}
```

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

6.26 UploadCABundle

POST

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.

Request

```
POST https://{{ip}}/redfish/v1/UpdateService/Actions/Oem/UpdateService.UploadCABundle
Content-Type: multipart/form-data; boundary=-------493918603359346570222237
```

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--
```

Response

The response status is 204 with no body. For Error Responses refer Section ''Redfish Error Response'' and Section ''Status Codes''.

6.27 CertificateLocations OEM Properties

The AMI implement Oem property contained within the "Ami" json object.

The "Ami" json object contained within the "Oem" json object according to the clause from dmtf redfish spec (DSP0266) OEM property format and content.

Get

Request

GET https://{{ip}}/redfish/v1/CertificateService/CertificateLocations

Content-Type: application/json

Table 206 CertificateLocations Links/Oem properties

Name	Type	Read Only	Description			
@odata.type	String	True	Refer Section ODATA Properties			
PrimarySMTP	Object	True	Name	Type	Read only	Description
			@odata.id	String	True	Refer Section ODATA Properties
Secondary SMTP	Object	True	Name	Type	Read only	Description
			@odata.id	String	True	Refer Section ODATA Properties

Response

The response of the request will return 200 with response body in JSON format with the OData properties.

Chapter 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 207 Telemetry Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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
Description	String	True	Provides description of the resource. Refer Section Resource
MetricDefinitions	Object	True	A collection of Metric definitions that describes metrics properties. The entries shall be resources of type MetricDefinitionCollection.
MetricReportDefinitions	Object	True	A collection of MetricReportDefinitions. The value shall be a link to a resource of type MetricReportDefinitionCollection.
MetricReports	Object	True	A collection of MetricReport resources, that relate to MetricReportDefinition.
Triggers	Object	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 5 triggers. Restricted internally.*
Status	Object	True	Refer Section Resource for Resource.Status. **NOTE** 1. *If "ServiceEnabled" attribute has a value true, then the value of "State" under "Status" attribute will be "Enabled" and if ServiceEnabled attribute has a value false, then the value of "State" under "Status" attribute will be "Disabled".* 2. *HealthRollup is not applicable.*
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 5**.
MinCollectionInterval	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 PT10M**.
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]
SupportedCollectionFunctions@Redfish.AllowableValues	Array	True	This attribute signifies the set of allowable values for the SupportedCollectionFunctions property. [Minimum,Summation,Average and Maximum are the set of allowable values for the SupportedCollectionFunctions property]
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.
ServiceEnabled	Boolean	False	This property shall indicate whether the telemetry service is in enabled state or not. The default value for this attribute will be true.

GET

Request

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

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_2_1.TelemetryService",
  "Actions" : {
    "#TelemetryService.SubmitTestMetricReport" : {
      "@Redfish.ActionInfo" : "/redfish/v1/TelemetryService/SubmitTestMetricReportActionInfo",
      "target" : "/redfish/v1/TelemetryService/Actions/TelemetryService.SubmitTestMetricReport"
    }
  },
  "Description" : "TelemetryService",
  "Id" : "TelemetryService",
  "LogService" : {
    "@odata.id" : "/redfish/v1/TelemetryService/LogService"
  },
  "MaxReports" : 5,
  "MetricDefinitions" : {
```

```
      "@odata.id" : "/redfish/v1/TelemetryService/MetricDefinitions"
   },
   "MetricReportDefinitions" : {
      "@odata.id" : "/redfish/v1/TelemetryService/MetricReportDefinitions"
   },
   "MetricReports" : {
      "@odata.id" : "/redfish/v1/TelemetryService/MetricReports"
   },
   "MinCollectionInterval" : "PT10M",
   "Name" : "TelemetryService",
   "Status" : {
      "Health" : "OK",
      "State" : "Enabled"
   },
   "ServiceEnabled" : true,
   "SupportedCollectionFunctions" : [
      "Summation",
      "Minimum",
      "Maximum",
      "Average"
   ],
   "SupportedCollectionFunctions@Redfish.AllowableValues" : [
      "Average",
      "Maximum",
      "Summation",
      "Minimum"
   ],
   "Triggers" : {
      "@odata.id" : "/redfish/v1/TelemetryService/Triggers"
   }
}
```


NOTE
The ServiceEnabled attribute was introduced in the DMTF Redfish Schema versioned 2019.4. Hence, in the case of Telemetry Service Root URI alone, to support the ServiceEnabled attribute, we are migrating to 2019.4 for supporting this attribute alone from DMTF Redfish Schema versioned 2019.2, which is currently supported by RTP version 1.8.a. Remaining URIs under Telemetry Service is implemented based on the Redfish Schema versioned 2019.2.

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/LogService/Entries''. For the allowed attributes in the POST Request Body under the URI, refer the below mentioned table.

NOTE
If the value of the ServiceEnabled attribute available under the Telemetry Service Resource (i.e./redfish/v1/TelemetryService) is true, it signifies that the Telemetry Service is in

Enabled state and the POST Request will succeed and if it is false, it signifies that the Telemetry Service is in Disabled state and it will fail with an error message stating, "The operation failed because this service is disabled and can no longer take incoming requests."

Table 208 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.

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/1/ReadingCelsius",
        "MetricValue" : "23" ,
        "Timestamp" : "2019-07-01T06:05:52+05:00"
      }]
}
```

Response

The response status is 202 Accepted with the created Task Instance as the response body. For Error Responses refer Section "Redfish Error Response" and Section "Status Code".

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

The limitation applied to this resource is that only 3 concurrent requests can be currently executing for SubmitTestMetricReport Action, at a given time. In order to issue an additional request, we need to wait for atleast one request to finish from the earlier issued ones and so on.

In order for SubmitTestMetricReport Action to return 202 Accepted with Task Instance in Response Body, the following programmatic flow comes into the picture:

Step 1: Validate all Request Body Properties. If Error exists, throw 400 Bad Request with corresponding error body. If success, go to Step 2.

Step 2: Check for the total count of current tasks.

If count_of_current_tasks >= Maximum_Tasks_Limit(i.e. 15), then check for the value of CompletedTaskOverWritePolicy attribute. If the value of CompletedTaskOverWritePolicy attribute is anything other than "Overwrite", then throw 400 Bad Request with "CreateLimitReachedForResource" Error. If "Overwrite" is the value of CompletedTaskOverWritePolicy attribute, then check for any older tasks in the states "Completed" or "Cancelled" or "Exception". If so, then delete those tasks and create a Task and return 202 Accepted.

If count_of_current_tasks < Maximum_Tasks_Limit, then create a Task and return 202 Accepted. In this scenario, only one task will be created, irrespective of the number of Active Subscriptions. This task will show the status of all the

Failure/Success Event Destinations.

Step 3: The User may then give a GET Request periodically to check the status of the created Task based on the Task Instance returned in Step 2.

In the background, the created task will trigger the Task Daemon and it will execute a Lua File and pass the event related data as an argument to the file. The Lua File will run as a separate thread.

Step 4: Inside the thread execution, we will get the list of Available Active Subscriptions first. Then we will get the list of Active Subscriptions who have ''MetricReport'' as the ''EventFormatType''.

If there are no Active Subscriptions itself, then the created task will have ''NoActiveSubscriptionPresent'' Error Message and the ''TaskStatus'' will be updated as ''Warning'' and ''TaskState'' as ''Exception'' and the thread will terminate.

If there are no Active Subscriptions having ''MetricReport'' as the ''EventFormatType'', then the created task will have ''NoActiveSubscriptionOfFormatTypeMetricReportPresent'' Error Message and the ''TaskStatus'' will be updated as ''Warning'' and ''TaskState'' as ''Exception'' and the thread will terminate.

If there are Active Subscriptions having ''MetricReport'' as the ''EventFormatType'', Frame the Event Notification data and go to Step 5.

Step 5: Loop the Event Subscribers one by one, do some logical-checks-done-in-event-service-daemon.

If at-least one logical-checks fail, add ''SubmitTestMetricReportPreconditionsFailed'' Message to the response body and proceed to the next subscriber. If all logical-checks pass, try sending the event to the corresponding event destination.

If Event Notification is delivered to the destination, add ''Success'' Message to the response body and proceed to the next subscriber. If Event Notification fails to be delivered to the destination, add the appropriate Message from among ''CouldNotEstablishConnection'' and ''SourceDoesNotSupportProtocol'' to the response body and proceed to the next subscriber.

Continue the step until we are done with all the subscribers. If the Event Notification fails to be delivered to at-least one destination, then update ''TaskStatus'' as ''Critical'' and ''TaskState'' as ''Exception''. If the Event Notification is delivered to all destination, then update ''TaskStatus'' as ''OK'' and ''TaskState'' as ''Completed''. Finally set the collective response body to the Messages attribute of the created task instance.

The Event of ''MetricReport'' EventFormatType sent to the Destination has attributes in compliance to the Metric Report Schema, except for a few attributes like ''MetricReportDefinition'', ''@odata.id'', etc. since the generated event is a dummy Metric Report and it cannot be mapped to any of the existing Redfish Resources.

The ReportSequence attribute in the generated Metric Report has an auto incremented value, starting with 1 and is not related to the value of the ReportSequence attribute under the MetricReports Resource generated with

reference to the corresponding MetricReportDefinitions Resource. The generated Metric Report will have the sample format as mentioned below :

```
{
      "@odata.context" : "/redfish/v1/$metadata#MetricReport.MetricReport" ,
      "@odata.type" : "#MetricReport.v1_2_0.MetricReport" ,
      "Id" : "Test MetricReport" ,
      "MetricValues" :[
        {
          "MetricId" : "Average_Temp_Reading" ,
          "MetricProperty" : "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius" ,
          "MetricValue" : "23" ,
          "Timestamp" : "2019-07-01T06:05:52+05:00"
        }
      ],
      "Name" : "Average_Temperature" ,
      "ReportSequence" :1,
      "Timestamp" : "2019-07-01T06:05:52+05:00"
}
```

PATCH

Request

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

Request Body

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

Example Request Body for Editing ServiceEnabled of TelemetryService:

```
{
   "ServiceEnabled" : < Either true or false >
}
```

Example Request Body for Editing SupportedCollectionFunctions of TelemetryService:

```
{
   "SupportedCollectionFunctions" :[
         "Maximum" ,
         "Minimum" ,
         "Summation"
   ]
}
```

NOTE
If the value of the ServiceEnabled attribute available under the Telemetry Service Resource(i.e. /redfish/v1/TelemetryService) is true, it signifies that the Telemetry Service is in Enabled state and the PATCH Request will succeed and if it is false, it signifies that the Telemetry Service is in Disabled state and it will fail with an error message stating, "The operation failed because this service is disabled and can no longer take incoming requests." . Two attributes are patchable ServiceEnabled and SupportedCollectionFunctions, out of which the above mentioned scenario applies to SupportedCollectionFunctions attribute alone.

Response

The response status is success with status code as 204 and no body. For Error Responses refer Section ''Redfish Error Response'' and Section ''Status Codes''.

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.

GET

Request

```
https://{{ip}}/redfish/v1/TelemetryService/MetricDefinitions
Content-Type: application/json
```

Reponse

Please refer Section Collection for the JSON response properties.

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" ,
   "Description": "Metric Definitions Collection",
   "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 209 Metric Definition Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
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.
Description	String	True	Provides description of the resource. Refer Section Resource
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. Boolean,DateTime,Decimal,Integer,String,Enumeration
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 with reference to the @odata.id value under the Chassis Power/Thermal URI for the corresponding sensor.* *For e.g.,* */redfish/v1/Chassis/{{system_instance}}/Thermal#/Fans/5/ReadingRPM* */redfish/v1/Chassis/{{system_instance}}/Thermal#/Temperatures/1/ReadingCelsius*

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	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. Default value is 5.
Calculable	String	True	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 calculatiion using the metric reading. **NonCalculatable**: No calculations should be performed on the metric reading. **NonSummable**: The sum of the metric reading across multiple instances is not meaningful. Summable: The sum of the metric reading across multiple instances is meaningful. **NOTE** *North Bound Support only available.*
CalculationAlgorithm	String	True	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. **Average**: The metric shall be calculated as the average of a metric reading over a sliding time interval. **Maximum**: The metric shall be calculated as the maximum of a metric reading over a sliding time interval. **Minimum**: The metric shall be calculated as the minimum of a metric reading over a sliding time interval. **NOTE** *North Bound Support only available.*
CalculationTimeInterval	String	True	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. **NOTE** *North Bound Support only available.*
PhysicalContext	String	True	The value of this property shall specify the physical context of the metric. **NOTE** *North Bound Support only available.*

GET

Request

```
https://{{ip}}/redfish/v1/TelemetryService/MetricDefinitions/Fan_Reading
Content-Type: application/json
```

Reponse

Please refer the sample response below.

```
{
   "@odata.context" : "/redfish/v1/$metadata#MetricDefinition.MetricDefinition" ,
   "@odata.etag" : "\"1581501930\"",
   "@odata.id" : "/redfish/v1/TelemetryService/MetricDefinitions/Fan_Reading" ,
   "@odata.type" : "#MetricDefinition.v1_0_2.MetricDefinition" ,
   "Description" : "Fan Reading",
   "Accuracy" : 5,
   "Id" : "Fan_Reading" ,
   "Implementation" : "PhysicalSensor" ,
   "IsLinear" : true,
   "MetricDataType" : "Integer" ,
   "MetricProperties" : [
      "/redfish/v1/Chassis/Self/Thermal#/Fans/0/ReadingRPM" ,
      "/redfish/v1/Chassis/Self/Thermal#/Fans/1/ReadingRPM" ,
      "/redfish/v1/Chassis/Self/Thermal#/Fans/2/ReadingRPM" ,
      "/redfish/v1/Chassis/Self/Thermal#/Fans/3/ReadingRPM" ,
      "/redfish/v1/Chassis/Self/Thermal#/Fans/4/ReadingRPM" ,
      "/redfish/v1/Chassis/Self/Thermal#/Fans/5/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.

GET

Request

```
https://{{ip}}/redfish/v1/TelemetryService/MetricReportDefinitions
Content-Type: application/json
```

Reponse

Please refer Section Collection for the JSON response properties.

Please refer the sample response below.


```
{
   "@odata.context" :"/redfish/v1/$metadata#MetricReportDefinitionCollection.MetricReportDefinitionCollection",
   "@odata.etag" : "\"1581503501\"",
   "@odata.id" : "/redfish/v1/TelemetryService/MetricReportDefinitions",
   "@odata.type" : "#MetricReportDefinitionCollection.MetricReportDefinitionCollection",
   "Description" : "Metric Report Definitions Collection",
   "Members" : [
      {
         "@odata.id" :"/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport"
      },
      {
         "@odata.id" : "/redfish/v1/TelemetryService/MetricReportDefinitions/TemperatureReport"
      }
   ],
   "Members@odata.count" : 2,
   "Name" : "MetricReportDefinitions"
}
```


POST

The following properties are mandatory to create a Metric Report Definition:

- Id
- Name
- Schedule.RecurrenceInterval
- MetricReport
- MetricReportDefinitionType
- MetricProperties or Metrics

NOTE

- *If the value of the ServiceEnabled attribute available under the Telemetry Service Resource(i.e. /redfish/v1/TelemetryService) is true, it signifies that the Telemetry Service is in Enabled state and the POST Request will succeed and if it is false, it signifies that the Telemetry Service is in Disabled state and it will fail with an error message stating, "The operation failed because this service is disabled and can no longer take incoming requests.".*
- *Status->State and Status-Health are read-only attributes and cannot be passed in the POST Request Body.*

- *Only a maximum of 5 MetricReportDefinitions can be created.*
- *MaxReports Limit is 5(i.e. Maximum Number of MetricrReportDefinitions that can be created by issuing POST Request is 5(considered internally) and Maximum number of Metric Reports that is generated internally is also 5).*
- *Consider the following scenario. Suppose a MetricReportDefinition is created with SuppressRepeatedMetric = false and ReportUpdates = NewReport and RecurrenceInterval = PT10M . In this case, new Metric Report shall be generated every 10 minutes. After a certain duration, the count of Metric Reports will definitely reach the MaxReports Limit(i.e., 5). 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.*
- *Consider the following cases of creation of MetricReportDefinitions:*
  ***Case 1.** Assume MetricReportDefinitions Count has reached the MaxReports Limit irrespective of whether Count ofMetricReports has reached the MaxReports Limit or not*
  1. *Create any MRD(i.e. with ReportActions = ["RedfishEvent" , "LogToMetricReportsCollection"] or with ReportActions = ["RedfishEvent"] or with ReportActions = ["LogToMetricReportsCollection"]) is not allowed.*

  ***Case 2.** Assume MetricReportDefinitions count has not reached the MaxReports Limit but Count of MetricReports has reached the MaxReports Limit*
  1. *Create MRD with ReportActions = ["RedfishEvent", "LogToMetricReportsCollection"] is not allowed.*
  2. *Create MRD with ReportActions = ["LogToMetricReportsCollection"] is not allowed.*
  3. *Create MRD with ReportActions = ["RedfishEvent"] is allowed.*

Request with Metric Properties

```
https://{ip}/redfish/v1/TelemetryService/MetricReportDefinitions
Content-Type: application/json
{
        "Id" : "TemperatureReport" ,
        "Name" : "Temperature_Report" ,
        "Description": "Temperature Report",
        "Schedule" :{
                "RecurrenceInterval" : "PT10M"
        },
        "MetricReportDefinitionType" : "Periodic" ,
```

```
        "MetricReport" : {
                "@odata.id : /redfish/v1/TelemetryService/MetricReports/TemperatureReport"
        },
        "MetricProperties" :[
                "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius" ,
                "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius"
        ],
}
```

Response

```
HTTP/1.1 201 Created
Location:
https://<IP>/redfish/v1/ TelemetryService/MetricReportDefinitions/TemperatureReport

{
    "@odata.context" : "/redfish/v1/$metadata#MetricReportDefinition.MetricReportDefinition" ,
    "@odata.etag" : "\"1581503147\"" ,
    "@odata.id" : "/redfish/v1/TelemetryService/MetricReportDefinitions/TemperatureReport" ,
    "@odata.type" : "#MetricReportDefinition.v1_3_0.MetricReportDefinition" ,
    "Id" : "TemperatureReport" ,
    "Description": "TemperatureReport",
    "MetricProperties" : [
      "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius" ,
      "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius"
    ],
    "MetricReport" : {
      "@odata.id" : "/redfish/v1/TelemetryService/MetricReports/TemperatureReport"
    },
    "MetricReportDefinitionEnabled" : true,
    "MetricReportDefinitionType" : "Periodic" ,
    "Name" : "Temperature_Report" ,
    "ReportActions" : [
      "LogToMetricReportsCollection"
    ],
    "ReportUpdates" : "Overwrite" ,
    "Schedule" : {
      "RecurrenceInterval" : "PT10M"
    },
    "Status" : {
      "Health" : "OK" ,
      "State" : "Enabled"
    }
}
```

Request with Metrics

```
{
    "Id" : "AverageTemperatureReport" ,
    "Name" : "Average_Temperature_Report" ,
    "Description": "Average Temperature Report",
    "Schedule" : {
          "RecurrenceInterval" : "PT10M"
    },
    "MetricReportDefinitionType" : "Periodic" ,
    "MetricReport" : {
        "@odata.id : /redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
    },
    "Metrics" : [
```

```
        {
            "MetricId" : "AverageTemperature",
            "CollectionTimeScope" : "Interval",
            "MetricProperties" : [
                    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius",
                    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius"
            ],
            "CollectionDuration" : "PT10M",
            "CollectionFunction" : "Average"
        }
        ]
}
```

Response

```
HTTP/1.1 201 Created
Location:
https://<IP>/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport

{
    "@odata.context" : "/redfish/v1/$metadata#MetricReportDefinition.MetricReportDefinition",
    "@odata.etag" : "\"1581503501\"",
    "@odata.id" :"/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport
",
    "@odata.type" : "#MetricReportDefinition.v1_3_0.MetricReportDefinition",
    "Id" : "AverageTemperatureReport",
    "MetricReport" : {
        "@odata.id" : "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
    },
    "MetricReportDefinitionEnabled" : true,
    "MetricReportDefinitionType" : "Periodic",
    "Metrics" : [
      {
        "CollectionDuration" : "PT10M",
        "CollectionFunction" : "Average",
        "CollectionTimeScope" : "Interval",
        "MetricId" : "AverageTemperature",
        "MetricProperties" : [
                "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius",
                "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius"
        ]
      }
   ],
   "Name" : "Average_Temperature_Report",
   "Description": "Average Temperature Report",
   "ReportActions" : [
        "LogToMetricReportsCollection"
   ],
   "ReportUpdates" : "Overwrite",
   "Schedule" : {
        "RecurrenceInterval" : "PT10M"
   },
   "Status" : {
        "Health" : "OK",
        "State" : "Enabled"
   }
}
```

Request with MetricReportHeartbeatInterval, SuppressRepeatedMetricValue and MetricReportDefinitionEnabled

```
{
    "Id" : "AverageTemperatureReport",
    "Name" : "Average_Temperature_Report",
    "Schedule" : {
      "RecurrenceInterval" : "PT10M"
    },
    "MetricReportDefinitionType" : "Periodic",
    "SuppressRepeatedMetricValue" : true,
    "MetricReportDefinitionEnabled" : true,
    "MetricReportHeartbeatInterval" : "PT15M",
    "MetricReport" : {
      "@odata.id" : "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
    },
    "Metrics" : [
      {
          "MetricId" : "AverageTemperature",
          "CollectionTimeScope" : "Interval",
          "MetricProperties" : [
            "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius",
            "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius"
          ],
          "CollectionDuration" : "PT10M",
          "CollectionFunction" : "Average"
      }
    ]
}
```

Response

```
HTTP/1.1 201 Created
Location:
https://<IP>/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport

{
    "@odata.context" : "/redfish/v1/$metadata#MetricReportDefinition.MetricReportDefinition",
    "@odata.etag" : "\"1583757340\"",
    "@odata.id" :"/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport
",
    "@odata.type" : "#MetricReportDefinition.v1_3_0.MetricReportDefinition",
    "Id" : "AverageTemperatureReport",
    "MetricReport" : {
      "@odata.id" : "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
    },
    "MetricReportDefinitionEnabled" : true,
    "MetricReportDefinitionType" : "Periodic",
    "MetricReportHeartbeatInterval" : "PT15M",
    "Metrics" : [
      {
          "CollectionDuration" : "PT10M",
          "CollectionFunction" : "Average",
          "CollectionTimeScope" : "Interval",
          "MetricId" : "AverageTemperature",
          "MetricProperties" : [
            "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius",
            "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius"
          ]
```

```
        }
    ],
    "Name" : "Average_Temperature_Report" ,
    "Description": "Average_Temperature_Report",
    "ReportActions" : [
        "LogToMetricReportsCollection"
    ],
    "ReportUpdates" : "Overwrite" ,
    "Schedule" : {
        "RecurrenceInterval" : "PT10M"
    },
    "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 210 Metric Report Definition Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
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(M)	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.
Description	String	True	Provides description of the resource. Refer Section Resource **NOTE** *If the user passes any value for Description attribute in the POST Request Body, the same will be considered else the value of Name attribute passed by the user in the POST Request Body will be assigned to Description attribute.*
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. Limited to greater than or equal to PT10M.
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 Resource for Resource.Status. **NOTE** *The property Status/State will changed to Disabled when MetricReportDefinitionEnabled is false.*
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.* **NOTE** *MetricProperties only support the values defined under the*

			"MetricProperties" attribute under each of the Members of MetricDefinitions URI /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	The value of this property shall be a boolean indicating whether this MetricReportDefinition is enabled for generating new MetricReports. **NOTE** *Default value for "MetricReportDefinitionEnabled" attributr is true.*
SuppressRepeatedMetricValue	Boolean	False	The value of this property shall indicate whether suppression of Metric information has been enabled or not. 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. A value of false means that the suppression mechanism is not applied to the MetricReport being generated. 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". **NOTE** *Default value for "SuppressRepeatedMetricValue" attributr is true.*
MetricReportHeartbeatInterval	String	False	This property specifices 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. The property value shall be a Redfish Duration describing the time internal 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. The value of this attribute shall be a Redfish Duration in the below mentioned format. -?P(T(\\d+H)?(\\d+M)?(\\d+(.\\d+)?S)?)? **NOTE** *Thers is no default value for "MetricReportHeartbeatInterval" attribute.*
ReportTimespan	String	False	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(T(\\d+H)?(\\d+M)?(\\d+(.\\d+)?S)?)? 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 MeteicReportDefinition. 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. **NOTE** *Thers is no default value for ''ReportTimespan'' attribute. This property will not update the value of MetricReportDefinitionEnabled or Status*
AppendLimit	Integer	True	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. **NOTE** *By default, this limit is configured to 200. It cannot be modified or passed in the request body to POST MetricReportDefinitions.*
ReportActions	Array	True	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. **NOTE** *By default this property will have the value LogToMetricReportCollection.* Also MetricReportDefinitions and MetricReports updation or generation will not add any log entries inside MetricReportLogs. ''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 ''LogToMetricreportsCollection'' with/without the value ''RedfishEvent''.
ReportUpdates	String	True	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. **NOTE** *When the attribute ReportUpdates has a value ''Newreport'', the service creates a new Metric Report resource based on the values of the attributes RecurrenceInterval and MetricReportHeartbeatInterval. The resource name for the first Metric Report for the corresponding Metric Report Definition will be the Metric Report resource name itself and from the second Metric Report onwards, it will be the Metric Report resource name concatenated with the Epoch Unix Timestamp at which the Metric Report will be generated.*

<table>
<tr><td></td><td></td><td></td><td>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.</td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td>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>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>Refer Table Resource Complex Types under Section Resource
NOTE
It will be present in response if there is an oem Property implemented according to “How to Add OEM extensions” document</td></tr>
<tr><td>Triggers</td><td>Array</td><td>True</td><td>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 RedfishMetricRepor.
NOTE
This attribute will only be displayed in the response, if we create one or more Triggers and pass the corresponding @odata.id in the POST Request Body for MetricReportDefinitions.</td></tr>
<tr><td>Triggers@odata.count</td><td>Integer</td><td>True</td><td>An integer representing the number of items in a collection.
NOTE
This attribute will only be displayed in the response, if we pass the number of Triggers specified under Links-> Triggers attribute in the POST Request Body for MetricReportDefinitions.</td></tr>
</table></td></tr>
<tr><td>Metrics</td><td>Object</td><td>True</td><td>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.</td></tr>
</table>

			Properties	Description
			MetricId	Id of the metric
			CollectionDuration	Time interval. Limited to greater than or equal to PT10M.
			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 "MetricProperties" attribute under each of the Members of MetricDefinitions URI /redfish/v1/TelemetryService/MetricDefinitions.*

Table 211 Correlation between ReportUpdates and ReportActions

ReportUpdates	**When ReportActions is [Redfish Event]**	**When ReportActions is [LogToMetricReportsCollection]**	**When ReportActions is [RedfishEvent, LogToMetricReportsCollection]**
Overwrite	Not Supported. It will throw a 400 Bad Request.	Overwrite the sensor data over and again in a MetricReport.	Overwrite the sensor data over and again in a MetricReport. Continuously Send Events.
AppendStops WhenFull	Not Supported. It will throw a 400 Bad Request.	Sensor data appended in a MetricReport, with AppendLimit at 200. Stop appending Sensor data to Metric Report once AppendLimit is reached	Sensor data appended in a MetricReport, with AppendLimit at 200. Stop appending Sensor data to Metric Report once AppendLimit is reached. Stop sending Events once AppendLimit is reached.
AppendWraps WhenFull	Not Supported. It will throw a 400 Bad Request.	Sensor data appended in a MetricReport, with AppendLimit at 200. Append Wraps Sensor data to Metric Report once AppendLimit is reached.	Sensor data appended in a MetricReport, with AppendLimit at 200. Append Wraps Sensor data to Metric Report once AppendLimit is reached. Continuously Send Events.
NewReport	Not Supported. It will throw a 400 Bad Request.	New MetricReport generated at each scheduled interval. Stop creating New Reports, once	New MetricReport generated at each scheduled interval. Continue creating New Metric Reports but not to be inserted

		MaxReports limit is reached.	under MetricReports Resource. Continuously Send Events, even after MaxReports limit is reached.

GET

Request

https://{{ip}}/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport

Content-Type: application/json

Reponse

Please refer the sample response below.


```
{
    "@odata.context" : "/redfish/v1/$metadata#MetricReportDefinition.MetricReportDefinition" ,
    "@odata.etag" : "\"1581503942\"" ,
    "@odata.id" :"/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport
" ,
    "@odata.type" : "#MetricReportDefinition.v1_3_0.MetricReportDefinition" ,
    "Id" : "AverageTemperatureReport" ,
    "MetricReport" : {
      "@odata.id" : "/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport"
    },
    "MetricReportDefinitionEnabled" : true,
    "MetricReportDefinitionType" : "Periodic" ,
    "Metrics" : [
      {
        "CollectionDuration" : "PT10M" ,
        "CollectionFunction" : "Average" ,
        "CollectionTimeScope" : "Interval" ,
        "MetricId" : "AverageTemperature" ,
        "MetricProperties" : [
          "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius" ,
          "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius"
        ]
      }
    ],
    "Name" : "Average_Temperature_Report" ,
    "Description": "Average_Temperature_Report",
    "ReportActions" : [
      "LogToMetricReportsCollection"
    ],
    "ReportUpdates" : "Overwrite" ,
    "Schedule" : {
      "RecurrenceInterval" : "PT10M"
    },
    "Status" : {
      "Health" : "OK" ,
      "State" : "Enabled"
    }
}
```

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.

NOTE
If the value of the ServiceEnabled attribute available under the Telemetry Service Resource(i.e. /redfish/v1/TelemetryService) is true, it signifies that the Telemetry Service is in Enabled state and the DELETE Request will succeed and if it is false, it signifies that the Telemetry Service is in Disabled state and it will fail with an error message stating, "The operation failed because this service is disabled and can no longer take incoming requests.".

Request

```
https://{ip}/redfish/v1/TelemetryService/MetricReportDefinitions/AverageTemperatureReport
Content-Type: application/json
```

Reponse

```
HTTP/1.1 204 No Content
```

PATCH

Request

```
PATCH
https://{{ip}}/redfish/v1/TelemetryService/MetricReportDenitions/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 212 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	The value of this property shall indicate whether suppression of Metric information has been enabled or not. 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. A value of false means that the suppression mechanism is not applied to the MetricReport being generated. 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".
MetricReportHeartbeatInterval	String	False	This property specifices an interval to send complete MetricReport regardless of whether values have changed. It is used in addition to the ReccurrenceInterval 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. The property value shall be a Redfish Duration describing the time internal 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.
ReportTimespan	String	False	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(T(\\d+H)?(\\d+M)?(\\d+(.\\d+)?S)?)?" 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 MeteicReportDefinition. 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. **NOTE** *There is no default value for "ReportTimespan" attribute.* *This property will not update the value of MetricReportDefinitionEnabled or Status*

NOTE
If the value of the ServiceEnabled attribute available under the Telemetry Service Resource(i.e. /redfish/v1/TelemetryService) is true, it signifies that the Telemetry Service is in Enabled state and the PATCH Request will succeed and if it is false, it signifies that the Telemetry Service is in Disabled state and it will fail with an error message stating, "The operation failed because this service is disabled and can no longer take incoming requests." .

Example PATCH Request Body:

```
{
   "MetricReportDefinitionEnabled" :true,
   "SuppressRepeatedMetricValue" :true,
```

```
    "MetricReportHeartbeatInterval" : "PT15M"
}
```

Reponse

```
HTTP/1.1 204 No Content
```

The below mentioned scenarios are taken into consideration while generating Metric Reports. If value of attribute RecurrenceInterval is specified(say PT[x]M) and SuppressRepeatedMetricValue attribute has a value of false , then the suppression mechanism is not applied to the MetricReport being generated and every PT[x]M , 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]M) 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]M) and SuppressRepeatedMetricValue attribute has a value of true , then every PT[y]M , the complete MetricReport will be generated and sent regardless of whether values have changed.
- If value of attribute MetricReportHeartbeatInterval is specified(say PT[y]M) 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.
- The default value for the property MetricReportDefinitionEnabled is true. The MetricReportDefinition and its corresponding MetricReports will not be updated/created if the value for this property is false. The user can create a MetricReportDefinition with MetricReportDefinitionEnabled as false. In this case the MetricReports will only be generated after PATCH ing MetricReportDefinitionEnabled to true.
- The property Status/State will changed to Disabled when MetricReportDefinitionEnabled is false

7.6 Metric Report Collection

This resource specifies an abstract metric Value.
It displays a collection of Metric Reports.

GET

Request

```
https://{{ip}}/redfish/v1/TelemetryService/MetricReports
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.
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"
   "Description": "Metric Reports Collection",
}
```

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.

GET

Table 213 Metric Report Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Seciton ODATA Properties
@odata.id	String	True	Refer Seciton ODATA Properties
@odata.type	String	True	Refer Seciton ODATA Properties
@odata.etag	String	True	Refer Seciton ODATA Properties
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.
Description	String	True	Provides description of the resource. Refer Section Resource
MetricReportDefinition	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	This property shall contain the current sequence identifier for this metric report. **NOTE** *This property will get updated each time when the Metric Report updates.* When the ReportUpdates property for the MetricReportDefninition 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.
MetricValues	Array	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.

Request

```
https://{{ip}}/redfish/v1/TelemetryService/MetricReports/AverageTemperatureReport
Content-Type: application/json
```

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/2/ReadingCelsius",
         "MetricValue" : "0",
         "Timestamp" : "2020-02-12T05:39:02+00:00"
   },
   {
         "MetricId" : "AverageTemperature",
         "MetricProperty" : "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius",
         "MetricValue" : "0",
         "Timestamp" : "2020-02-12T05:39:02+00:00"
      }
   ],
   "Name" : "Average_Temperature_Report",
   "Description": "Average TemperatureReport",
   "ReportSequence" : "1",
   "Timestamp" : "2020-02-12T05:39:02+00:00"
}
```

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.

GET

Request

```
https://{{ip}}/redfish/v1/TelemetryService/Triggers
Content-Type: application/json
```

Response

Please refer Sectin Collection for the JSON response properties.
Please refer the sample response below.

```
{
    "@odata.context" : "/redfish/v1/$metadata#TriggersCollection.TriggersCollection" ,
    "@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,
  "Description": "Triggers Collection"
  "Name" : "Triggers Collection"
}
```

POST

The following properties are mandatory to create a trigger:

- Id
- Name
- MetricType
- TriggerActions
- NumericThresholds or (DiscreteTriggerCondition & DiscreteTriggers)
- MetricProperties

NOTE

- *If the value of the ServiceEnabled attribute available under the Telemetry Service Resource(i.e. /redfish/v1/TelemetryService) is true, it signifies that the Telemetry Service is in Enabled state and the POST Request will succeed and if it is false, it signifies that the Telemetry Service is in Disabled state and it will fail with an error message stating, "The operation failed because this service is disabled and can no*

longer take incoming request.”.

- *When issuing a POST request to create a Trigger, the attributes Status->State and Status-Health are read-only attributes and hence, cannot be passed in the POST Request Body.*
- *Only a maximum of 5 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 atleast 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 subattributes - Name, Value, Severity and DwellTime. The sub-attributes Value, Severity and DwellTime are mandatory ones whereas Name is an optional one.*
- *In the case of Discrete Triggers, the Resource URI Properties that can be supported by the MetricProperties attribute is determined by the below factors : JSON defines seven value types: string, number, object, array, true, false, and null. Redis supports 5 types of data types - Strings, Hashes, Lists, Sets and Sorted Sets.*

As per the DMTF Redfish Specification, the attributes that are supported by the URIs can be either of the above listed JSON value types and based on the JSON value type, the data stored in the Redis DB can be either of the above listed Redis data types and the key format being used to store the value of the attribute in Redis DB is not consistent across and will vary from attribute to attribute.

For e.g. Consider the attributes AuthFailureLoggingThreshold, AccountLockoutThreshold and Status under the response of Account Service URI.

```
{
   "@odata.id": "/redfish/v1/AccountService",
   "@odata.type": "#AccountService.v1_8_0.AccountService",
   "AccountLockoutThreshold": 5,
   "AuthFailureLoggingThreshold": 3,
   "Status": {
                  "Health": "OK",
                  "State": "Enabled"
   }
    . . . . .
}
```

The attributes AuthFailureLoggingThreshold and AccountLockoutThreshold in the response are neither an object/array data type nor nested object/array types but belongs to a simple data type(i.e., number value types) and hence the Redis Data type used to store the value is Sets (i.e. SET, GET operations)

SET Redfish:AccountService:AuthFailureLoggingThreshold 3
SET Redfish:AccountService:AccountLockoutThreshold 5

whereas the attributes Status/State and Status/Health in the response are object value types and hence the Redis Data type used to store the value is Hashes (i.e. HSET, HGET operations).

HSET Redfish:AccountService:Status State "Enabled"
HSET Redfish:AccountService:Status Health "OK"

So, as per the current implementation,

- *Resource URI Properties that are of the following JSON value types string, number, true and false and are stored in the Redis DB using the Strings (i.e. SET, GET operations) data type is supported by the MetricProperties attribute.*
- *Also, Resource URI properties that appear within a nested object in the response and are stored in the Redis DB using the Strings (i.e. SET, GET operations) data type is supported by the MetricProperties attribute.*
- *However, Resource URI properties that are of either object or array value types and are stored in the Redis DB using any other Redis data types other than Strings(i.e. Hashes, Lists, Sets and Sorted Sets) are not supported. This is a limitation wrt to the above mentioned factors.*

Request to create Numeric Triggers with an OEM AMI Attribute ControlTriggerAlerts"

```
https://{ip}/redfish/v1/TelemetryService/Triggers
Content-Type: application/json

{
        "Id" : "TemperatureTrigger",
        "Name" : "Temperature Trigger",
        "Description": "Temperature_Trigger",
        "MetricType" : "Numeric",
        "TriggerActions" :[
                "LogToLogService",
                "RedfishEvent"
        ],
        Oem": {
                "Ami": {
                        "ControlTriggerAlerts" : "true"
                }
        },
        "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/1/ReadingCelsius",
                    "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius"
            ]
}
```

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",
        "MetricProperties" : [
                "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius",
                "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius"
        ],
        "MetricType" : "Numeric",
        "Name" : "Temperature Trigger",
        "Description": "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
                }
        },
```

```
        Oem'' : {
                ''Ami'' : {
                        ''@odata.type'' : ''#AMITriggers.v1_0_0.AMITriggers'',
                        ''ControlTriggerAlerts'' : ''true''
                }
        },
        ''Status'' : {
                ''Health'' : ''OK'',
                ''State'' : ''Enabled''
        },
        ''TriggerActions'' : [
                ''RedfishEvent'',
                ''LogToLogService''
        ]
}
```

Request to create Numeric Triggers without an OEM AMI Attribute ''ControlTriggerAlerts''

```
https://{ip}/redfish/v1/TelemetryService/Triggers
Content-Type: application/json
{
    ''Id'' : ''TemperatureTrigger'',
    ''Name'' : ''Temperature Trigger'',
    ''Description'': ''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/1/ReadingCelsius'',
            ''/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius''
    ]
}
```

Response

```
HTTP/1.1 201 Created
Location:
http://<IP>/redfish/v1/TelemetryService/ Triggers/TemperatureTrigger

{
      "@odata.context" :"/redfish/v1/$metadata#TelemetryService.Triggers(Name,TriggerActions,Met
ricProperties,Id,Status,Links,MetricType,NumericThresholds)" ,
      "@odata.etag" : "\"1573457484\"" ,
      "@odata.id" : "/redfish/v1/TelemetryService/Triggers/TemperatureTrigger" ,
      "@odata.type" : "#Triggers.v1_1_1.Triggers" ,
      "Id : TemperatureTrigger" ,
      "MetricProperties" : [
                  "/redfish/v1/Chassis/Self/Thermal#/Temperatures/1/ReadingCelsius" ,
                  "/redfish/v1/Chassis/Self/Thermal#/Temperatures/2/ReadingCelsius"
      ],
      "MetricType" : "Numeric" ,
      "Name" : "Temperature Trigger" ,
      "Description" : "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"
      ]
}
```

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"
      ]
}
```

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,Metric
Properties,DiscreteTriggerCondition,DiscreteTriggers,TriggerActions,MetricType,Description)" ,
   "@odata.etag" : "\"1583924493\"" ,
   "@odata.id" : "/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED" ,
   "@odata.type" : "#Triggers.v1_1_1.Triggers" ,
   "Description" : "Chassis_IndicatorLED" ,
   "DiscreteTriggerCondition" : "Specified" ,
   "DiscreteTriggers" : [
   {
      "DwellTime" : "PT30S" ,
      "Name" : "LED_Blinking" ,
      "Severity" : "Critical" ,
      "Value" : "Blinking"
   }
   ],
   "Id" : "ChassisIndicatorLED" ,
   "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.

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 214 Trigger Instance Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.context</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.id</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.etag</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>Id(M)</td><td>String</td><td>True</td><td>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.</td></tr>
<tr><td>Name</td><td>String</td><td>True</td><td>The value of this property shall be the name of the metric.</td></tr>
<tr><td>Description</td><td>String</td><td>True</td><td>Provides description of the resource. Refer Section Resource
NOTE
If the user passes any value for Description attribute in the POST Request Body, the same will be considered else the value of Name attribute passed by the user in the POST Request Body will be assigned to Description attribute.</td></tr>
<tr><td>MetricType</td><td>String</td><td>True</td><td>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.</td></tr>
<tr><td>Oem</td><td>Object</td><td>False</td><td>This object represents the attributes supported by AMI under the Oem property. It can also contain an object of type OemObject.
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>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>The value of this property shall be a URI fragment that specifies the type of the resource and it shall be of the form defined in the Redfish specification.</td></tr>
<tr><td>ControlTriggerAlerts</td><td>String</td><td>False</td><td>This property is only applicable in the case of Numeric Triggers. This property controls the trigger actions(LogToLogService / RedfishEvent / RedfishMetric Report) for</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td colspan="4"></td><td>Numeric Triggers.</td></tr>
<tr><td>TriggerActions</td><td>Array</td><td>True</td><td colspan="5">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.
RedfishEvent: This value indicates that when a trigger condition is met, the Service shall send an event to subscribers.
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.</td></tr>
<tr><td rowspan="6">NumericThresholds</td><td rowspan="6">Object</td><td rowspan="6">True</td><td colspan="5">This property shall contain list of triggers to which a sensor reading will be compared.</td></tr>
<tr><td>Name</td><td>Type</td><td>Read only</td><td colspan="2">Description</td></tr>
<tr><td>LowerCritical</td><td>Object</td><td>True</td><td colspan="2">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 Numeric Thresholds Sub-Attributes for the sub attributes under this property.</td></tr>
<tr><td>LowerWarning</td><td>Object</td><td>True</td><td colspan="2">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 Numeric Thresholds Sub-Attributes for the sub attributes under this property.</td></tr>
<tr><td>UpperCritical</td><td>Object</td><td>True</td><td colspan="2">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 Numeric Thresholds Sub-Attributes for the sub attributes under this property.</td></tr>
<tr><td>UpperWarning</td><td>Object</td><td>True</td><td colspan="2">The value of this property shall indicate the Reading is</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>above the normal range. The units shall be the same units as the Reading. Please refer Table Numeric Thresholds Sub-Attributes for the sub attributes under this property.</td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td colspan="5">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>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>Refer Table Resource Complex Types under Section Resource.
NOTE
It will be present in response if there is an oem Property implemented according to “How to Add OEM extensions” document</td></tr>
<tr><td>MetricReportDefinitions</td><td>Array</td><td>True</td><td>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.
NOTE
This attribute will only be displayed in the response, if we create one or more MetricReportDefinitions and pass the corresponding “@odata.id” in the POST Request Body for Triggers.</td></tr>
<tr><td>MetricReportDefinitions@oda</td><td>Integer</td><td>True</td><td>An integer representing the</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>ta.count</td><td></td><td></td><td>number of items in a collection.
NOTE
This attribute will only be displayed in the response, if we pass the number of MetricReportDefinitions specified under Links-> MetricReportDefinitions attribute in the POST Request Body for Triggers.</td></tr>
<tr><td>DiscreteTriggerCondition</td><td>String</td><td>True</td><td colspan="4">This property shall contain the conditions when a discrete metric needs to trigger. Supported Values are ‘‘Specified’’ and ‘‘Changed’’.
Changed: A discrete trigger condition is met whenever the metric value changes.
Specified: A discrete trigger condition is met when the metric value becomes one of the values that the DiscreteTriggers property lists.
NOTE
If the value for this attribute is ‘‘Specified’’, then the attribute ‘‘DiscreteTriggers’’ should be present.
If the value for this attribute is ‘‘Changed’’, then the attribute ‘‘DiscreteTriggers’’ itself should not be present.</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td colspan="4">Refer Section Resource for Resource.Status.</td></tr>
<tr><td>Metricproperties</td><td>Array</td><td>True</td><td colspan="4">A collection of URI for the properties on which this metric definition is defined.
NOTE
In the case of Numeric Triggers, MetricProperties only support the values defined under the ‘‘MetricProperties’’ attribute under each of the Members of MetricDefinitions URI /redfish/v1/TelemetryService/MetricDefinitions. In the case of Discrete Triggers, MetricProperties can support URI properties with the following JSON value type – string, number, true and false.</td></tr>
<tr><td>DiscreteTriggers</td><td>Array</td><td>True</td><td colspan="4">This property shall contain list of triggers to which a sensor reading will be compared. The list of triggers is limited to a maximum count of 10 (i.e. the DiscreteTriggers Array can have a maximum count of 10 values).
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.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>Name</td><td>String</td><td>True</td><td>Name of discrete trigger</td></tr>
<tr><td>Value</td><td>String</td><td>True</td><td>This property shall contain</td></tr>
</table></td></tr>
</table>

						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. In the current implementation for DwellTime, Days(D) are not supported and Hours(H),Minutes(M) and Seconds(S) alone are supported.*

Table 215 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	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. **NOTE** *This attribute is mandatory for Numeric Trigger creation. In the current implementation for DwellTime, Days(D) are not supported and Hours(H),Minutes(M) and Seconds(S) alone are supported.*
Activation	String	False	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''. **Decreasing**: This threshold is activated when the reading changes from a value higher than the threshold to a value lower than the threshold. **Either**: This threshold is activated when either the Increasing or Decreasing conditions are met. **Increasing**: This threshold is activated when the reading changes from a value lower than the threshold to a value higher than the threshold. **NOTE** *This attribute is mandatory for Numeric Trigger creation.*

GET

Request

```
https://{{ip}}/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED
Content-Type: application/json
```

Response

Please refer the sample response below.

```
{
    ''@odata.context'' : ''/redfish/v1/$metadata#TelemetryService.Triggers'',
    ''@odata.etag'' : ''\''1583924493\''"",
    ''@odata.id'' : ''/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED'',
    ''@odata.type'' : ''#Triggers.v1_1_1.Triggers'',
    ''Description'' : ''Chassis_IndicatorLED'',
    ''DiscreteTriggerCondition'' : ''Specified'',
    ''DiscreteTriggers'' : [
      {
        ''DwellTime'' : ''PT30S'',
        ''Name'' : ''LED_Blinking'',
        ''Severity'' : ''Critical'',
        ''Value'' : ''Blinking''
```

```
        }
    ],
    "Id" : "ChassisIndicatorLED" ,
    "MetricProperties" : [
        "/redfish/v1/Chassis/Self#/IndicatorLED"
    ],
    "MetricType" : "Discrete" ,
    "Name" : "Chassis_IndicatorLED" ,
    "Status" : {
        "Health" : "OK" ,
        "State" : "Enabled"
    },
    "TriggerActions" : [
        "RedfishEvent" ,
        "LogToLogService"
    ]
}
```

DELETE

The DELETE operation is used to delete either a numeric or a discrete trigger.

NOTE

If the value of the ServiceEnabled attribute available under the Telemetry Service Resource (i.e. /redfish/v1/TelemetryService) is true, it signifies that the Telemetry Service is in Enabled state and the DELETE Request will succeed and if it is false, it signifies that the Telemetry Service is in Disabled state and it will fail with an error message stating, "The operation failed because this service is disabled and can no longer take incoming requests.".

Request

```
https://{ip}/redfish/v1/TelemetryService/Triggers/ChassisIndicatorLED
Content-Type: application/json
```

Response

```
HTTP/1.1 204 No Content
```

Chapter 8. Composability

8.1 Composition Service

Composition Service contains the links of ResourceBlocks and Resource Zones collections.

GET

Request

```
https://{{ip}}/redfish/v1/CompositionService
Content-Type: application/json
```

Response

Table 216 Composition Service Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
Status	Object	True	Refer Section Resource 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.

PATCH

Request

```
https://{{ip}}/redfish/v1/CompositionService
Content-Type: application/json
```

Example PATCH Request Body:

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

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

8.2 ResourceBlocks Collection

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

GET

Request

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

Content-Type: application/json

Response

Please refer Section Collection 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.

GET

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

Response

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

Table 217 Resource Block Instance Properties

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

<table>
<tr><td></td><td></td><td></td><td>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.</td></tr>
<tr><td>Id(M)</td><td>String</td><td>True</td><td>Resource Identifier</td></tr>
<tr><td>Name(M)</td><td>String</td><td>True</td><td>Name of the Resource</td></tr>
<tr><td>Description</td><td>String</td><td>True</td><td>Provides description of the resource. Refer Section Resource</td></tr>
<tr><td>Status</td><td>Object</td><td>True</td><td>Refer Section Resource for Resource.Oem.</td></tr>
<tr><td>CompositionStatus (M)</td><td>Object</td><td>False</td><td>This property describes the composition status details for this Resource Block.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>Reserved</td><td>boolean</td><td>False</td><td>This represents if the Resource Block is reserved by any client.</td></tr>
<tr><td>MaxCompositions</td><td>Number</td><td>True</td><td>The maximum number of compositions in which this Resource Block is capable of participating simultaneously.</td></tr>
<tr><td>CompositionState</td><td>String</td><td>True</td><td>This property represents the current state of the Resource Block from a composition perspective.
<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Composed</td><td>Final successful state of a Resource Block which has participated in composition.</td></tr>
<tr><td>Unused</td><td>Indicates the Resource Block is free and can participate in composition.</td></tr>
</table></td></tr>
</table></td></tr>
<tr><td>ResourceBlockType(M)</td><td>Array</td><td>True</td><td>This property represents the types of resources available on this Resource Block.</td></tr>
<tr><td>Links</td><td>Object</td><td>True</td><td>Contains references to other resources that are related to this resource.
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>Oem</td><td>Object</td><td></td><td>Refer Table Resource Complex Types under Section Resource.
NOTE
It will be present in response if there is an oem property implemented according to “How to Add OEM extensions” document.</td></tr>
<tr><td>Computer Systems</td><td>Array</td><td>true</td><td>An array of references to the Computer Systems that are composed from this Resource Block.</td></tr>
</table></td></tr>
</table>

			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.*			
Processors@odata.count	Number	True	An integer representing the number of items in a collection.			
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.*			
Memory@odata.count	Number	True	An integer representing the number of items in a collection.			
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.*			
Storage@odata.count	Number	True	An integer representing the number of items in a collection.			
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.*			
SimpleStorage@odata.count	Number	True	An integer representing the number of items in a collection.			
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.*			
Drives@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 available in this Resource Block. **NOTE** *This reference link will be populated only for NetworkBlock.*			
EthernetInterfaces@odata.count	Number	True	An integer representing the number of items in a collection.			

PATCH

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
Content-Type: application/json
```

Example PATCH Request Body:

```
{
        "CompositionStatus" : {
                "Reserved" : false
        }
}
```

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and Section "Status Codes".

8.4 ResourcZone Collection

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

GET

Request

```
https://{{ip}}/redfish/v1/CompositionService/ResourceZones
Content-Type: application/json
```

Response

Please refer Section Collection for the JSON response properties.

8.5 ResourceZone

GET

Request

https://{{ip}}/redfish/v1/CompositionService/ResourceZones/1

Content-Type: application/json

Response

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

Table 218 ResourceZone Instance Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
Status	Object	True	Refer Section Resource 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 Table Resource Complex Types under Section Resource. **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.

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 219 Collection Capabilities Annotation Property List

Name	Type	Read Only	Description
Capabilities	Array	True	This property shall contain an array of objects that describe the capabilities of this resource collection. For the properties of Capabilities please refer Table Capabilities Annotation Property List.
@odata.type	String	True	Refer Section ODATA Properties
MaxMembers	Integer	True	This property shall contain the maximum number of members allowed in this resource collection. The minimum value is 1.

Table 220 Capabilities Annotation Property List

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th colspan="4">Description</th></tr>
<tr><td rowspan="3">UseCase</td><td rowspan="3">String</td><td rowspan="3">True</td><td colspan="4">This property represents the use case in which a client may issue a POST request to the collection.</td></tr>
<tr><td>Enum</td><td colspan="3">Description</td></tr>
<tr><td>ComputerSystem Composition</td><td colspan="3">This capability describes a client creating a new Computer System instance from a set of disaggregated hardware</td></tr>
<tr><td rowspan="4">Links (M)</td><td rowspan="4">Object</td><td rowspan="4">True</td><td colspan="4">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.</td></tr>
<tr><td>Name</td><td>Type</td><td>Read only</td><td>Description</td></tr>
<tr><td>RelatedItem</td><td>Array</td><td>True</td><td>The ID(s) of the resources associated with this capability.</td></tr>
<tr><td>TargetCollection (M)</td><td>Array</td><td>True</td><td>Reference to the collection that this capabilities structure is describing</td></tr>
<tr><td>Capabilities Object</td><td>Object</td><td>True</td><td colspan="4">Reference to the resource the client may GET to in order to understand how to form a POST request for a given collection.</td></tr>
</table>

8.7 Capabilities

Capabilities Indicates the properties to be included in a composed system.

GET

Request

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

Content-Type: application/json

Response

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

Table 221 Capabilities Property List

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.context</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.id</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>@odata.etag</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>Id</td><td>String</td><td>True</td><td>Resource Identifier</td></tr>
<tr><td>Name (M)</td><td>String</td><td>True</td><td>Name of the Resource</td></tr>
<tr><td>Links@Redfish.RequiredOnCreate</td><td>String</td><td>True</td><td>The value of the property is “true”.
NOTE
For more info about this annotation, refer below Table “List of Property Annotation and Description”</td></tr>
<tr><td>Links (M)</td><td>Object</td><td>True</td><td>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>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>ResourceBlocks@Redfish.RequiredOnCreate</td><td>String</td><td>True</td><td>The value of the property is “true”</td></tr>
<tr><td>ResourceBlocks@Redfish.UpdatableAfterCreate</td><td>String</td><td>True</td><td>The value of the property is “true”</td></tr>
</table></td></tr>
<tr><td>Boot@Redfish.OptionalOnCreate</td><td>String</td><td>True</td><td>The value of the property is true.
NOTE
For more info about this annotation, refer Table “List of Property Annotation and Description”</td></tr>
<tr><td>Boot</td><td>Object</td><td>False</td><td>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 17 ComputerSystem - Boot Properties for the general properties and Table 188 List of Property Annotation and Description for Annotation Properties.
<table>
<tr><th>Property Annotation/Name</th><th>Type</th><th>Read Only</th><th>Value</th></tr>
<tr><td>BootSourceOverrideEnabled@Redfish.OptionalOnCreate</td><td>String</td><td>True</td><td>true</td></tr>
<tr><td>BootSourceOverrideEnabled</td><td>Object</td><td>True</td><td>Allowable</td></tr>
</table></td></tr>
</table>

			@Redfish.AllowableValues			values list – “Disabled”, “Once”, “Continuous”
			BootSourceOverrideEnabled@Redfish.UpdatableAfterCreate	String	True	false
			BootSourceOverrideTarget@Redfish.OptionalOnCreate	String	True	true
			BootSourceOverrideTarget@Redfish.UpdatableAfterCreate	String	True	false
			“BootSourceOverrideTarget@Redfish.AllowableValues”	Object	True	Allowable values list – “None”, “Pxe”, “Floppy”, “Cd”, “Usb”, “Hdd”, “BiosSetup”, “Utilities”, “Diags”, “UefiShell”, “UefiTarget”, “SDCard”, “UefiHttp”, “RemoteDrive”, “UefiBootNext”
Description	String	True	Provides description of the resource. Refer Section Resource			
Description@Redfish.OptionalOnCreate	String	True	The value of the property is true. **NOTE** *For more info about this annotation, refer below Table “List of Property Annotation and Description”*			
Description@Redfish.SetOnlyOnCreate	String	True	The value of the property is true. **NOTE** For more info about this annotation, refer below Table “List of Property Annotation and Description”			
HostName@Redfish.OptionalOnCreate	String	True	The value of the property is true. **NOTE** For more info about this annotation, refer below Table “List of Property Annotation and Description”			
HostName@Redfish.UpdatableAfterCreate	String	True	The value of the property is false. **NOTE** For more info about this annotation, refer below Table “List of Property Annotation and Description”			
Name@Redfish.RequiredOnCreate	String	True	The value of the property is true. **NOTE** For more info about this annotation, refer below Table “List of Property Annotation and Description”			
Name@Redfish.SetOnlyOnCreate	String	True	The value of the property is true. **NOTE** For more info about this annotation, refer below Table “List of Property Annotation and Description”			

Table 222 List of Property Annotation and Description

Property Annotation	Description
Redfish.RequiredOnCreate	If this annotation value is true, the client must provide the given property in the body of the create (POST) request else vice versa
Redfish.OptionalOnCreate	If this annotation value is true, the client may provide the property in the body of the create (POST) request.
Redfish.SetOnlyOnCreate	If this annotation value is true, then the related property 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	If this annotation value is true, the client is allowed to update the related 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.

8.8 Compose a System

Client creates a composed system after identifying the needed resourceblocks and the given capabilities information in the resourcezone.

POST

In the request, the client is creating a new Computer System using the Resource Blocks ''ComputeBlock'', ''DrivesBlock'' and ''NetworkBlock''.

Request

```
POST https://{{ip}}/redfish/v1/Systems
Content-Type: application/json
```

Example POST Request Body:

```
{
   ''Name'' : ''ComposedSystem'' ,
   ''Links'' : {
      ''ResourceBlocks'' : [
         { ''@odata.id'': ''/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock''},
         { ''@odata.id'' : ''/redfish/v1/CompositionService/ResourceBlocks/DrivesBlock'' },
         { ''@odata.id'' : ''/redfish/v1/CompositionService/ResourceBlocks/NetworkBlock'' }
      ]
   },
}
```

Response

The response status is 201 with below response. For Error Responses refer Section ''Redfish Error Response'' and Section ''Status Codes''.

```
{
    "@odata.context" : "/redfish/v1/$metadata#ComputerSystem.ComputerSystem",
    "@odata.etag" : "W/\"1657019210\"",
    "@odata.id" : "/redfish/v1/Systems",
    "@odata.type" : "#ComputerSystem.v1_15_0.ComputerSystem",
    "Actions" : {
      "#ComputerSystem.Reset" : {
        "@Redfish.ActionInfo" : "/redfish/v1/Systems/Self/ResetActionInfo",
        "target" : "/redfish/v1/Systems/Self/Actions/ComputerSystem.Reset"
      }
    },
    "Boot" : {
      "BootSourceOverrideEnabled" : "Continuous",
      "BootSourceOverrideEnabled@Redfish.AllowableValues" : [
        "Disabled",
        "Once",
        "Continuous"
      ],
      "BootSourceOverrideTarget" : "Pxe",
      "BootSourceOverrideTarget@Redfish.AllowableValues" : [
        "None",
        "Pxe",
        "Floppy",
        "Cd",
        "Usb",
        "Hdd",
        "BiosSetup",
        "Utilities",
        "Diags",
        "UefiShell",
        "UefiTarget",
        "SDCard",
        "UefiHttp",
        "RemoteDrive",
        "UefiBootNext"
      ]
      "UefiTargetBootSourceOverride" : null
    },
    "Description" : "Computer System",
    "EthernetInterfaces" : {
      "@odata.id" : "/redfish/v1/Systems/Self/EthernetInterfaces"
    },
    "HostName" : null,
    "Id" : "ComposedSystem",
    "Links" : {
        "ResourceBlocks" : [
        {
          "@odata.id" : "/redfish/v1/CompositionService/ResourceBlocks/ComputeBlock"
        },
        {
          "@odata.id" : "/redfish/v1/CompositionService/ResourceBlocks/DrivesBlock"
        },
        {
          "@odata.id" : "/redfish/v1/CompositionService/ResourceBlocks/NetworkBlock"
        }
      ]
    },
    "Memory" : {
```

```
        "@odata.id" : "/redfish/v1/Systems/Self/Memory"
    },
    "Name" : "ComposedSystem",
    "PowerState" : "On",
    "Processors" : {
        "@odata.id" : "/redfish/v1/Systems/Self/Processors"
    },
    "SimpleStorage" : {
        "@odata.id" : "/redfish/v1/Systems/Self/SimpleStorage"
    },
    "Storage" : {
        "@odata.id" : "/redfish/v1/Systems/Self/Storage"
    },
    "SystemType" : "Composed",
    "UUID" : "a374466-c48c-42d6-9cb9-179252b505f2"
}
```


GET

To get the newly created composed system

Request

```
https://{{ip}}/redfish/v1/Systems/{{new_system}}
Content-Type: application/json
```

Response

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

Table 223 Newly Composed System Properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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 Resource
SystemType	String	True	An enumeration that indicates the kind of system that this resource represents.
Actions	Object	True	ComputerSystem allows the user to perform Reset Action and it's allowable values are as given in Section Resource. 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

<table>
<tr><td></td><td></td><td></td><td>to), this resource
<table>
<tr><th>Name</th><th>Type</th><th>Read only</th><th>Description</th></tr>
<tr><td>Resource Blocks</td><td>Array</td><td>False</td><td>An array of references to the Resource Blocks</td></tr>
</table></td></tr>
<tr><td>UUID</td><td>String</td><td>True</td><td>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.
NOTE
This can be populated by Host Interface, (Extra Bios Support is needed).</td></tr>
<tr><td>HostName</td><td>String</td><td>True</td><td>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.
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.</td></tr>
<tr><td>PowerState</td><td>String</td><td>True</td><td>The current power state of the system.
NOTE
This can be populated by Host Interface, (Extra Bios Support is needed).
<table>
<tr><th>Enum</th><th>Description</th></tr>
<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>
</table></td></tr>
<tr><td>Boot</td><td>Object</td><td>True</td><td>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 ComputerSystem Boot Properties
NOTE
This can be populated by Host Interface, (Extra Bios Support is needed).</td></tr>
<tr><td>Processors(N)</td><td>Object</td><td>True</td><td>A reference to the collection of Processors associated with this system.
NOTE
This can be populated by Host Interface, (Extra Bios Support is needed).</td></tr>
<tr><td>EthernetInterfaces(N)</td><td>Object</td><td>True</td><td>A reference to the collection of Ethernet interfaces associated with this system.
NOTE</td></tr>
</table>

			This can be populated by Host Interface, (Extra Bios Support is needed).
SimpleStorage(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).*
Memory(N)	Object	True	A reference to the collection of Memory associated with this system. **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).*

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.

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" },
               null
      ]
   }
}
```

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and "Status Codes".

DELETE

Request

```
DELETE https://{{ip}}/redfish/v1/Systems/{{new_system}}
Content-Type: application/json
```

Response

The response status is 204 and no response body. For Error Responses refer Section "Redfish Error Response" and "Status Codes".

Chapter 9. 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.

9.1 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

9.1.1 Reset Action:

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"
}
```

Example for Manager Reset with OperationApplyTime

```
https://{{ip}}/redfish/v1/Managers/Self/Actions/Manager.Reset
Content-Type: application/json
```

Example for POST Request Body with MaintenanceWindowStart:

```
{
```

```
        "ResetType": "ForceRestart",
        "@Redfish.OperationApplyTime": "AtMaintenanceWindowStart",
        "MaintenanceWindowStartTime": "2019-10-25T02:00:00+05:30"
}
```

Example for POST Request Body with Immediate

```
{
        "ResetType": "ForceRestart",
        "@Redfish.OperationApplyTime": "Immediate",
}
```

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",
        "@odata.id": "/redfish/v1/TaskService/Tasks/2",
        "@odata.type": "#Task.v1_4_2.Task",
        "Description": "Task for System Self Reset Maintenance Window Task",
        "Id": "2",
        "Name": "Systems SelfReset Maintenance Window Task",
        "TaskMonitor": "/redfish/v1/TaskService/TaskMonitors/1'
        "TaskState": "New"
}
```

Table 224 Operation Apply Time Response

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
Id(M)	String	True	Refer Section Resource
Name(M)	String	True	Refer Section Resource
Description	String	True	Provides description of the resource. Refer Section Resource
TaskState	String	True	Please refer TaskState property in Table 130 Task Property

Table 225 Redfish Settings Operation Apply Time - GET response

Name	Type	Read Only	Description
@odata.type	String	True	Refer Section ODATA Properties
MaintenanceWindowDurationInSeconds	number	True	This property indicates the expiry time of maintenance window in seconds.
MaintenanceWindowResource	Object	True	This property indicates the location of the maintenance window settings. Name: @odata.id; Type: String; ReadOnly: True; Description: Refer Section ODATA Properties
MaintenanceWindowStartTime	String	True	This property indicates the start time of a maintenance window specified by client. **NOTE** *The property format same as DateTime property from other URI's*
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. Immediate: Apply immediately. AtMaintenanceWindowStart: Apply during a maintenance window as specified by an administrator.

Table 226 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. Immediate: Apply immediately. AtMaintenanceWindowStart: Apply during a maintenance window as specified by an administrator.
MaintenanceWindowStartTime	String	False	This represents the start time of Maintenance window.

Chapter 10. RADIUS Authentication

The link to configure RADIUS server from Redfish will come under the ExternalAccountProviders.

10.1 RADIUS settings

GET

Request

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

Content-Type: application/json

Table 227 RADIUS settings properties

Name	Type	Read Only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.id	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
@odata.etag	String	True	Refer Section ODATA Properties
Oem	Object		Refer Table Resource Complex Types under Section Resource. **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	Refer Section Resource
Description	String	True	Refer Section Resource
Name(M)	String	True	Refer Section Resource
ServiceEnabled	Boolean	False	The value of this property shall be a boolean indicating whether this service is enabled.
AccountProviderTypes	String	True	This property shall contain the type of external account provider to which this Service connects. Enum: RedfishService — The external account provider shall be a DMTF Redfish Specification-comformant service. The ServiceAddresses format shall contain a collection of URIs that correspond to a Redfish Account Service entity. Enum: ActiveDirectoryService — The external account provider shall be a Microsoft Active Directory Technical Specification-comformant service. The ServiceAddresses format shall contain a collection of fully qualified domain names (FQDN) or NetBIOS names that links to the set of domain servers for the Active Directory service.

			LDAPService	The external account provider shall be an RFC4511-conformant service. The ServiceAddresses format shall contain a collection of fully qualified domain names (FQDN) that links to the set of LDAP servers for the Service.
			OEM	An OEM-specific external authentication or directory service.

Table 228 OEM Properties

<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td rowspan="9">Ami</td><td rowspan="9">Object</td><td rowspan="9">False</td><td>Contains information related to AMI features supported by the Service.
<table>
<tr><th>Name</th><th>Type</th><th>Read Only</th><th>Description</th></tr>
<tr><td>@odata.type</td><td>String</td><td>True</td><td>Refer Section ODATA Properties</td></tr>
<tr><td>AdvancedRADIUSSettings</td><td>Object</td><td>True</td><td>A reference to the resource AdvancedRADIUSSetting
NOTE
This property is shown only if the Radius Server is configured</td></tr>
<tr><td>ServiceAddress</td><td>String</td><td>False</td><td>This property shall contain the IPv4/IPv6 address assigned to the Radius Server</td></tr>
<tr><td>ServicePort</td><td>String</td><td>False</td><td>This property shall contain the port on which the radius server is running
NOTE
Default port is 1812</td></tr>
<tr><td>Secret</td><td>String</td><td>False</td><td>This property shall contain the text string that serves as a password between hosts
NOTE
This property will be displayed as null always</td></tr>
<tr><td>Timeout</td><td>Integer</td><td>True</td><td>Default timeout in seconds for RADIUS authentication</td></tr>
<tr><td>ExtendedPrivilege</td><td>Object</td><td>False</td><td>This object shall contains details of the extended privileges allowed for RADIUS servers.
Refer Table Extended Privilege Object</td></tr>
</table></td></tr>
</table>

Table 229 Extended Privilege Object

Name	Type	Read Only	Description			
ExtendedPrivilege	Object	False	This object shall contain information of the extended privileges allowed for RADIUS servers.			
			Name	Type	Read Only	Description
			KVMAccess	Boolean	False	The value of this property shall be a boolean indicating the KVM access to the RADIUS server
			VMediaAccess	Boolean	False	The value of this property shall be a Boolean indicating the VMedia access to the RADIUS server

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'' : 3
    }
  },
  ''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" : "#AMIExternalAccountProvider.v1_0_0.AMIExternalAccountProvider",
        "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"
}
```

PATCH

Request

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

Response

The response status is 204 with no body. For Error Responses refer Section "Redfish Error Response" and "Status Codes".

NOTE

If the value for the property ServiceEnabled is false, the PATCH request will respond with error message Service Disabled until ServiceEnabled is set to true.

Chapter 11. Appendix

11.1 Privilege

11.1.1 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.

11.1.2 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.
Refer the privilege redistry file entity definition.
/redfish/v1/Registries/Redfish_1.3.0_PrivilegeRegistry.json

Table 230 OEM URIs

URI	Entity
/redfish/v1/Oem/Ami/Configurations	AMIConfigurations
/redfish/v1/AccountService/Oem/Ami/Configurations	AMIAccountServiceConfigurations
/redfish/v1/Oem/Ami/InventoryData/Status	AMIInventoryStatus
/redfish/v1/Systems/{{systems_instance}}/Oem/Ami/BiosTable	AMIBiosTable
/redfish/v1/Systems/{{systems_instance}}/Oem/Ami/BiosTableTags	AMIBiosTableTags
/redfish/v1/Systems/{{system_instances}}/Oem/Ami/Inventory/Crc	InventoryCRC
/redfish/v1/EventService/Oem/Ami/SMTP/Certificates	AMISMTPCertificateCollection
/redfish/v1/EventService/Oem/Ami/SMTP/Certificates/{{Certificateinstance}}	AMISMTPCertificate

Table 231 OEM Action URIs

URI	Required Privilege
/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIVirtualMedia.ConfigureCDInstance	Manager
/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIVirtualMedia.EnableRMedia	Manager
/redfish/v1/UpdateService/Actions/Oem/UpdateService.UploadCABundle	UpdateService
/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIManager.RedfishPowerSaveMode	Manager

/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIManager.BackupConfig	Manager
/redfish/v1/Managers/{{system_instance}}/Actions/Oem/AMIManager.RestoreConfig	Manager

11.2 Predefined Roles

Table 232 Predefined Roles

Predefined Roles	Assigned Privileges
Administrator	‘‘Login’’ , ‘‘ConfigureManager’’ , ‘‘ConfigureUsers’’ , ‘‘ConfigureSelf’’, ‘‘ConfigureComponents’’
ReadOnly	‘‘Login’’ , ‘‘ConfigureSelf’’
Operator	‘‘Login’’ , ‘‘ConfigureSelf’’ , ‘‘ConfigureComponents’’
HostInterfaceAdministrator	‘‘Login’’ , ‘‘ConfigureManager’’ , ‘‘ConfigureUsers’’ , ‘‘ConfigureSelf’’, ‘‘ConfigureComponents’’ , ‘‘ConfigureHostInterface’’

NOTE
HostInterfaceAdministrator role is only for HostInterface Accounts and this role should not be used for creating new redfish account.

11.3 Redfish Inventory Support

In BMC, Redfish Inventory will be populated if :-

- *HostInterface support is enabled in Redfish PRJ Configuration.*
- *AMI BIOS with Redfish Support is available.*

Important: Please contact with your sales representative for further information on AMI BIOS Package distribution for Redfish Inventory Support.

The following are the resource URI s that can be populated through Host Interface:-
All the Attributes mentioned in this API document for the below mentioned resources will be Northbound supported. Based on BIOS provided data for these resources, values are populated for the properties as mentioned in the Excel AMI_RedfishSchemaSupportList.pdf which can be referred by contacting BIOS Sales Team.

Systems

- Processor, SubProcessors, ProcessorMetrics
- Memory, MemoryDomains, MemoryChunks and MemoryMetrics
- Systems Instance FutureState (SD) (Boot Properites), BootOption, Bios, SecureBoot, SecureBootDatabases
- EthernetInterface, VLANNetworkInterface, NetworkInterface
- Storage, Volume, Drives, SimpleStorage, StorageControllers
- AccelerationFunction, OperationConfigs

Chassis

- PCIeDevice, PCIeFunction, PCIeSlots
- NetworkInterfaces, Ports
- NetworkAdapters, NetworkDeviceFunctions
- Assembly, MediaController Instance

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.

Chapter 12. Reference Schemas

12.1 Event

Table 233 Event Properties

Name	Type	Read only	Description
@odata.context	String	True	Refer Section ODATA Properties
@odata.type	String	True	Refer Section ODATA Properties
Oem	Object	True	Refer Table Resource Complex Types under Section Resource. **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
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 234 EventRecord Properties

Name	Type	Read only	Description
Context	String	True	A context can be supplied at subscription time. This property is the context value supplied by the subscriber.
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.
MessageArgs	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 Table Resource Complex Types under Section Resource. **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.

Chapter 13. Technical Support

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For additional technical support or questions about trouble shooting, please contact the AIC® representative nearest to you or visit our AIC® website for more information.
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