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# Redfish Schema Bundle Readme

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

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# 1 Foreword

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The following files are part of the Redfish development effort:

- DSP0218 - Platform Level Data Model (PLDM) for Redfish Device Enablement Specification - Binary-encoded JSON (BEJ) and dictionary-based mapping of Redfish schemas and properties into PLDM messages.
- DSP0266 - Redfish Specification - Main Redfish Specification.
- DSP0268 - Redfish Data Model Specification - Normative descriptions and additional text for every schema defined in DSP8010 and example payloads for every resource.
- DSP0270 - Redfish Host Interface Specification - "In-band" or "OS-based" Redfish host interface.
- DSP0272 - Redfish Interoperability Profiles Specification - Structure and JSON document that is used to define and publish an interoperability profile that checks an implementation's conformance to a defined minimum set of functionality.
- DSP2043 - Redfish Mockups Bundle - Set of mockups that can be used as sample output from `GETs` from a Redfish service. Informative in nature, it was used to develop the schema. A person can set up an NGINX or similar server and configure it to output JSON format and then use this directory for demonstration purposes.
- DSP2044 - Redfish White Paper - Non-normative document helping those new to Redfish understand how to interact with the Redfish service and understand common functions and tasks.
- DSP2046 - Redfish Resource and Schema Guide - Informative documentation regarding common Redfish resource properties and a listing of properties that can be found in each of the Redfish resources.
- DSP2053 - Redfish Property Guide - Informative documentation providing an index to individual property definitions across all Redfish schema.
- DSP2065 - Redfish Message Registry Guide - Informative documentation providing details regarding the messages defined in Redfish standard message registries.
- DSP8010 - Redfish Schema - Redfish schema definitions. These files are normative in nature and are normatively referenced by the *Redfish Specification*. The three schema formats are CSDL (OData Common Schema Definition Language format, which is in XML), JSON Schema, and OpenAPI schema. These schema definitions should be functionally equivalent, thus specifying the schema in two different languages.
- DSP8011 - Redfish Standard Registries - Redfish registry definitions. This bundle of Redfish registries includes message registries used for Redfish-defined messages including events and privilege maps.
- DSP8013 - Redfish Interoperability Profiles Bundle - Bundle of published Redfish interoperability profile documents and supporting schema and sample documents used for creating profiles.

## 2 Redfish Schema Bundle contents

This bundle contains the set of Redfish schema files. The contents of the folder are put into several folders. Each folder contains a complete set of Redfish schema files for a given schema language. The folders are:

Folder	Description
<code>csdl</code>	OData Common Schema Definition Language formatted as XML files. The <code>RedfishExtensions_v1.xml</code> and <code>Resource_v1.xml</code> files contain core definitions of Redfish.
<code>dictionaries</code>	Redfish Device Enablement (RDE) dictionaries formatted as Binary-encoded JSON (BEJ) files. The <code>annotation.bin</code> and <code>annotation.map</code> files contain core annotation definitions of Redfish.
<code>json-schema</code>	JSON Schema formatted as JSON files. The <code>redfish-schema.*.json</code> and <code>odata.*.json</code> files contain supplementary information about the schema files.
<code>openapi</code>	OpenAPI formatted as YAML files. The <code>openapi.yaml</code> file contains the OpenAPI service document that describes all of the standard paths.

In addition, the bundle includes several schema guide documents, generated from the contents of Redfish schema files and published separately by DMTF, as a convenience. These documents are updated for each Redfish schema bundle release.

File	Description
<code>DSP2046_&lt;ver&gt;.PDF</code>	Redfish Resource and Schema Guide - Informative document presenting the contents of the Redfish schema in an easily consumed table format. Organized by schema name, the document shows a listing of properties that can be found in each of the Redfish resources.
<code>DSP2053_&lt;ver&gt;.PDF</code>	Redfish Property Guide - Informative document providing an alphabetic index to individual properties defined across all Redfish schema.
<code>DSP0268_&lt;ver&gt;.PDF</code>	Redfish Data Model Specification - Normative document presenting the contents of the Redfish schema in an easily consumed table format. Similar to DSP2046, the document is organized by schema name, but populates its tables using the normative text and descriptions from the schema files.

## 3 ANNEX A (informative) Change log

### 3.1 Release 2022.3 (September 2022)

Schema name	Version	Description
Key	N/A	Added new URI patterns for <code>Key</code> resource subordinate to <code>AggregationSource</code> .
KeyCollection	N/A	Added new URI patterns for <code>Key</code> resource subordinate to <code>AggregationSource</code> .
AggregationSource	1.3.0	Added <code>GenerateSSHIdentityKeyPair</code> and <code>RemoveSSHIdentityKeyPair</code> actions. Added <code>SSHSettings</code> and <code>Status</code> properties.
ComputerSystem	1.20.0	Added <code>CachePolicy</code> and <code>CacheDuration</code> to <code>KMIPServers</code> .
ConnectionMethod	1.1.0	Added <code>TunnelingProtocol</code> property.
Drive	1.16.0	Added <code>ActiveSoftwareImage</code> and <code>SoftwareImages</code> to <code>Links</code> .
EventDestination	1.13.0	Added <code>Kafka</code> to <code>Protocol</code> .
Key	1.2.0	Added <code>SSH</code> property.
ManagerDiagnosticData	1.2.0	Added <code>ServiceRootUptimeSeconds</code> property.
License	1.1.0	Added <code>TargetServices</code> property.
LicenseService	1.1.0	Added <code>AuthorizedDevices</code> and <code>TargetServices</code> parameters to the <code>Install</code> action.
ServiceRoot	1.15.0	Added <code>ManagerProvidingService</code> to <code>Links</code> .
SoftwareInventory	1.9.0	Added <code>VersionScheme</code> property.
Storage	1.14.0	Added <code>HotspareActivationPolicy</code> property.
AccountService	1.x.x	Errata release. Clarified the usage of <code>OAuthServiceSigningKeys</code> with token validation.
ExternalAccountProvider	1.x.x	Errata release. Clarified the usage of <code>OAuthServiceSigningKeys</code> with token validation.
Job	1.x.x	Errata release. Clarified the usage of the <code>Payload</code> property to show it's to contain request payload information.
License	1.0.1	Errata release. Clarified the usage of the <code>Service</code> and <code>Capacity</code> values in <code>AuthorizationScope</code> to describe the usage with aggregators.
ServiceRoot	1.x.x	Errata release. Removed the upper limit on the <code>MaxLevels</code> property.
Task	1.x.x	Errata release. Clarified the usage of the <code>Payload</code> property to show it's to contain request payload information.

## 3.2 Release 2022.2 (August 2022)

Schema name	Version	Description
EthernetInterface	N/A	Updated capabilities to allow for users to add and remove <code>EthernetInterface</code> resources for creating VLANs and teams.
EthernetInterfaceCollection	N/A	Updated capabilities to allow for users to add and remove <code>EthernetInterface</code> resources for creating VLANs and teams.
EnvironmentMetrics	N/A	Corrected URI patterns to allow for metrics subordinate to any Port resource.
FabricAdapter	N/A	Added missing URI patterns for FabricAdapter resources subordinate to ComputerSystem resources within a resource block.
FabricAdapterCollection	N/A	Added missing URI patterns for FabricAdapter resources subordinate to ComputerSystem resources within a resource block.
Port	N/A	Added missing URI patterns for Port resources subordinate to Processor resources and ComputerSystem resources within a resource block.
PortCollection	N/A	Added missing URI patterns for Port resources subordinate to Processor resources and ComputerSystem resources within a resource block.
PortMetrics	N/A	Corrected URI patterns to allow for metrics subordinate to any Port resource.
Privileges	N/A	Added <code>AdministrateSystems</code> , <code>OperateSystems</code> , <code>AdministrateStorage</code> , and <code>OperateStorageBackup</code> privileges.
RouteEntry	N/A	Added missing URI patterns for RouteEntry resources subordinate to ComputerSystem resources within a resource block.
RouteEntryCollection	N/A	Added missing URI patterns for RouteEntry resources subordinate to ComputerSystem resources within a resource block.
VCATEntry	N/A	Added missing URI patterns for RouteEntry resources subordinate to ComputerSystem resources within a resource block.
VCATEntryCollection	N/A	Added missing URI patterns for RouteEntry resources subordinate to ComputerSystem resources within a resource block.
SecurityPolicy	1.0.0	Initial release. Resource that provides a central point to configure the security policy of a manager.
TrustedComponent	1.0.0	Initial release. Resource that represents a trusted device, such as a TPM.
ActionInfo	1.3.0	Added <code>AllowableNumbers</code> and <code>AllowablePattern</code> to <code>Parameters</code> .
Assembly	1.4.0	Added <code>Replaceable</code> to <code>Assemblies</code> .

Schema name	Version	Description
Battery	1.2.0	Added <code>Replaceable</code> property.
Chassis	1.21.0	Added <code>TrustedComponents</code> , <code>HotPluggable</code> , <code>Replaceable</code> , and <code>Version</code> properties.
Circuit	1.7.0	Added <code>DC16V</code> , <code>DC12V</code> , <code>DC9V</code> , <code>DC5V</code> , <code>DC3_3V</code> , and <code>DC1_8V</code> to <code>NominalVoltageType</code> .
ComponentIntegrity	1.2.0	Added <code>TPMGetSignedMeasurements</code> action. Added <code>NonceSizeBytesMaximum</code> to <code>TPM</code> .
ComputerSystem	1.19.0	Deprecated <code>TrustedModules</code> in favor of <code>TrustedComponents</code> in <code>Links</code> . Added <code>Recovery</code> to <code>BootSource</code> .
Control	1.2.0	Added <code>ResetToDefaults</code> action.
EnvironmentMetrics	1.3.0	Added <code>ResetToDefaults</code> action.
EthernetInterface	1.9.0	Added <code>TeamMode</code> property. Added <code>Ports</code> and <code>RelatedInterfaces</code> to <code>Links</code> .
FabricAdapter	1.4.0	Added <code>LocationIndicatorActive</code> property.
Fan	1.3.0	Added <code>Replaceable</code> property.
LogEntry	1.13.0	Added <code>SpecificEventExistsInGroup</code> property.
Manager	1.16.0	Added <code>SecurityPolicy</code> , <code>DedicatedNetworkPorts</code> , and <code>SharedNetworkPorts</code> properties.
ManagerDiagnosticData	1.1.0	Added <code>UptimeSeconds</code> , <code>RestartCount</code> , and <code>RestartAfterFailureCount</code> to <code>TopProcesses</code> .
ManagerNetworkProtocol	1.9.0	Added <code>NetworkSuppliedServers</code> to <code>NTP</code> .
Memory	1.16.0	Added <code>ResetToDefaults</code> action.
MetricReport	1.5.0	Deprecated <code>MetricDefinition</code> in favor of <code>MetricId</code> .
NetworkDeviceFunction	1.9.0	Added <code>HTTP</code> to <code>BootMode</code> . Added <code>HTTPBoot</code> property.
PCleDevice	1.10.0	Added <code>Switch</code> to <code>Links</code> . Added <code>Retimer</code> to <code>DeviceType</code> .
PCleFunction	1.4.0	Added <code>Processor</code> to <code>Links</code> .
PowerSupply	1.5.0	Added <code>DCRegulator</code> to <code>PowerSupplyType</code> . Added <code>OutputNominalVoltageType</code> and <code>Replaceable</code> properties.
Processor	1.16.0	Added <code>Throttled</code> , <code>ThrottleCauses</code> , <code>Replaceable</code> , <code>ProcessorIndex</code> , and <code>Family</code> properties. Added <code>ResetToDefaults</code> action.
ProcessorMetrics	1.6.0	Added <code>PowerLimitThrottleDuration</code> and <code>ThermalLimitThrottleDuration</code> properties.
Sensor	1.6.0	Added <code>ResetToDefaults</code> action.
Session	1.5.0	Added <code>Context</code> property.
SoftwareInventory	1.8.0	Added <code>OSDistribution</code> to <code>AdditionalVersions</code> .



Schema name	Version	Description
AccountService	1.x.x	Errata release. Clarified that <code>OAuthServiceSigningKeys</code> and <code>Issuer</code> are configured by the client when the OAuth 2.0 mode is set to <code>Offline</code> .
ComponentIntegrity	1.x.x	Errata release. Updated the description for <code>TargetComponentURI</code> to allow it to reference a <code>TrustedComponent</code> resource for TPM devices. Clarified the nonce provided in the <code>SPDMGetSignedMeasurements</code> action is sent to the SPDM Responder in the 'GET_MEASUREMENTS' request. Added regular expression to <code>ComponentIntegrityTypeVersion</code> when <code>ComponentIntegrityType</code> is <code>SPDM</code> .
ExternalAccountProvider	1.x.x	Errata release. Clarified that <code>OAuthServiceSigningKeys</code> and <code>Issuer</code> are configured by the client when the OAuth 2.0 mode is set to <code>Offline</code> .
Job	1.x.x	Errata release. Added guidance for mapping values to <code>JobStatus</code> .
MemoryChunks	1.x.x	Errata release. Clarified the usage of <code>InterleaveSets</code> if not specified by the client. Added missing <code>required</code> term for <code>AddressRangeType</code> .
MetricDefinition	1.x.x	Errata release. Clarified that <code>MetricProperties</code> and <code>CalculationParameters</code> should not be present in the same resource instance.
MetricReport	1.x.x	Errata release. Clarified the usage of <code>MetricId</code> and <code>MetricProperty</code> .
MetricReportDefinition	1.x.x	Errata release. Clarified that <code>MetricProperties</code> and <code>MetricId</code> should not be present in the same object instance in the <code>Metrics</code> array. Clarified that calculations performed on metrics are optional.
Port	1.x.x	Errata release. Corrected regular expression patterns for LLDP transmit properties to allow for empty strings. Corrected the description for LLDP receive properties to state they should be omitted rather than be empty strings.
Schedule	1.x.x	Errata release. Clarified that <code>RecurrenceInterval</code> specifies the duration between intervals.
Settings	1.x.x	Errata release. Clarified the behavior of <code>Immediate</code> in <code>@Redfish.SettingsApplyTime</code> and <code>@Redfish.OperationApplyTime</code> to allow for side effects.
Task	1.x.x	Errata release. Added guidance for mapping values to <code>TaskStatus</code> .
UpdateService	1.x.x	Errata release. Updated the descriptions for the <code>StartUpdate</code> action to clarify that it's tied to usage with the operation apply time value <code>OnStartUpdateRequest</code> . Clarified that non-resource URIs should not contain URIs of Redfish resources.

### 3.3 Release 2022.1 (April 2022)

Schema name	Version	Description
Certificate	N/A	Corrected URI patterns for certificates subordinate to KMIP configurations for systems.

Schema name	Version	Description
CircuitCollection	N/A	Corrected URI patterns for switchgear units.
Processor	N/A	Updated URI patterns to allow for three levels of processors: package, core, and thread.
ProcessorCollection	N/A	Updated URI patterns to allow for three levels of processors: package, core, and thread.
Role	N/A	Corrected the resource capabilities to show the resource can be deleted.
RoleCollection	N/A	Corrected the resource capabilities to show new members can be inserted.
AccountService	1.11.0	Added <code>SSHKeyAttribute</code> to <code>SearchSettings</code> for LDAP.
Battery	1.1.0	Added <code>Links</code> property. Added <code>Memory</code> and <code>StorageControllers</code> to <code>Links</code> .
Certificate	1.6.0	Added <code>DisplayString</code> , <code>DomainComponents</code> , <code>AdditionalCommonNames</code> , and <code>AdditionalOrganizationalUnits</code> to <code>Subject</code> and <code>Issuer</code> .
Chassis	1.20.0	Added <code>FabricAdapters</code> , <code>PoweredByParent</code> , <code>ThermalManagedByParent</code> , and <code>ThermalDirection</code> properties. Added <code>PowerSupplies</code> , <code>Fans</code> , and <code>PowerDistribution</code> to <code>Links</code> . Deprecated <code>MediaControllers</code> in favor of <code>FabricAdapters</code> . Deprecated <code>PoweredBy</code> and <code>CooledBy</code> in favor of hardened references to deterministic resource types.
Circuit	1.6.0	Added <code>AC100To127V</code> to <code>NominalVoltageType</code> .
CollectionCapabilities	1.4.0	Added <code>RegisterResourceBlock</code> to <code>UseCase</code> .
ComponentIntegrity	1.1.0	Added <code>SecurityVersionNumber</code> to SPDm measurements.
ComputerSystem	1.18.0	Added <code>ManufacturingMode</code> and <code>Composition</code> properties. Added <code>LastBootTimeSeconds</code> to <code>BootProgress</code> .
Drive	1.15.0	Added <code>SanitizationType</code> and <code>OverwritePasses</code> to the <code>SecureErase</code> action.
Endpoint	1.7.0	Added <code>LocalPorts</code> to <code>Links</code> . Deprecated <code>Ports</code> in <code>Links</code> in favor of <code>ConnectedPorts</code> and <code>LocalPorts</code> .
ExternalAccountProvider	1.4.0	Added <code>SSHKeyAttribute</code> to <code>SearchSettings</code> for LDAP.
EventDestination	1.12.0	Added <code>ExcludeRegistryPrefixes</code> and <code>ExcludeMessageIds</code> properties. Added <code>SuspendSubscription</code> action. Added <code>DeliverBufferedEventDuration</code> parameter to the <code>ResumeSubscription</code> action.
EventService	1.8.0	Added <code>ExcludeRegistryPrefix</code> and <code>ExcludeMessageId</code> properties.
FabricAdapter	1.3.0	Added <code>FabricType</code> and <code>FabricTypeCapabilities</code> properties. Added <code>MemoryDomains</code> to <code>Links</code> .
Fan	1.2.0	Added <code>Links</code> property. Added <code>CoolingChassis</code> to <code>Links</code> .
Job	1.1.0	Added <code>EstimatedDuration</code> property.
Key	1.1.0	Added <code>SSH</code> to <code>KeyType</code> . Added <code>UserDescription</code> property.
LogEntry	1.12.0	Added <code>RelatedItem</code> and <code>RelatedLogEntries</code> to <code>Links</code> .

Schema name	Version	Description
Manager	1.15.0	Added <code>ServiceIdentification</code> and <code>AdditionalFirmwareVersions</code> properties.
ManagerAccount	1.9.0	Added <code>Keys</code> property.
Manifest	1.1.0	Added <code>RegisterResourceBlock</code> stanza type.
Memory	1.15.0	Added <code>Batteries</code> to <code>Links</code> .
MemoryMetrics	1.5.0	Added <code>IndeterminateCorrectableErrorCount</code> and <code>IndeterminateUncorrectableErrorCount</code> to <code>CurrentPeriod</code> and <code>LifeTime</code> .
MetricDefinition	1.3.0	Added <code>LogicalContexts</code> property.
PortMetrics	1.3.0	Added <code>PCIEErrors</code> property.
PowerSupply	1.4.0	Added <code>PoweringChassis</code> to <code>Links</code> .
Processor	1.15.0	Added <code>AdditionalFirmwareVersions</code> property.
ProcessorMetrics	1.5.0	Added <code>CorrectableCoreErrorCount</code> , <code>UncorrectableCoreErrorCount</code> , <code>CorrectableOtherErrorCount</code> , and <code>UncorrectableOtherErrorCount</code> properties.
ServiceRoot	1.14.0	Added <code>ServiceIdentification</code> property. Added <code>MultipleHTTPRequests</code> to <code>ProtocolFeaturesSupported</code> .
Session	1.4.0	Added <code>CreatedTime</code> property.
SoftwareInventory	1.7.0	Added <code>AdditionalVersions</code> property.
Storage	1.13.0	Deprecated <code>StorageControllers</code> the array property in favor of <code>Controllers</code> to represent storage controllers as their own resources.
StorageController	1.6.0	Added <code>Batteries</code> to <code>Links</code> .
Task	1.6.0	Added <code>EstimatedDuration</code> property.
Certificate	1.x.x	Errata release. Updated descriptions to reference attributes defined in RFC2985 and RFC5280.
Chassis	1.x.x	Errata release. Modified the permissions for <code>EnvironmentalClass</code> to be writable.
Circuit	1.x.x	Errata release. Added long descriptions for <code>NominalVoltageType</code> values to clarify usage for different devices.
ComputerSystem	1.x.x	Errata release. Removed redundant statements from the <code>Reset</code> action that are already described in the descriptions of the individual <code>ResetType</code> enumeration values.
Endpoint	1.x.x	Errata release. Clarified the description for <code>ConnectedPorts</code> in <code>Links</code> to show its usage is to reference the external port at the other end of the link.
Event	1.x.x	Errata release. Clarified the usage of <code>OriginOfCondition</code> for creation and deletion events.

Schema name	Version	Description
EventDestination	1.x.x	Errata release. Clarified behavioral semantics of <code>MessageIds</code> and <code>RegistryPrefixes</code> to account for cases where both properties and others are used simultaneously. Clarified the behavior of <code>OriginResources</code> and <code>ResourceTypes</code> to match semantics used for other control properties.
EventService	1.x.x	Errata release. Corrected the property references in many of the boolean properties that indicate the support of a property in an EventDestination resource.
LogEntry	1.x.x	Errata release. Clarified the usage of <code>OriginOfCondition</code> for creation and deletion events. Clarified the tie between <code>DiagnosticDataType</code> and <code>OEMDiagnosticDataType</code> and <code>AdditionalDataURI</code> .
LogService	1.x.x.	Errata release. Added text to the <code>CollectDiagnosticData</code> action descriptions to specify that the new <code>LogEntry</code> will contain the <code>AdditionalDataURI</code> property.
ManagerNetworkProtocol	1.x.x	Errata release. Modified the permissions for <code>EnterpriseSpecificMethod</code> within <code>SNMP</code> to be writable.
Port	1.x.x	Errata release. Clarified the descriptions for <code>AssociatedEndpoints</code> , <code>ConnectedSwitches</code> , <code>ConnectedSwitchPorts</code> , and <code>ConnectedPorts</code> in <code>Links</code> to better describe their intended usage.
PowerDistribution	1.x.x	Errata release. Clarified the usage of the <code>Chassis</code> property in <code>Links</code> .
Processor	1.x.x.	Errata release. Clarified that <code>SubProcessors</code> contains sub-processors of the processor and not the system.
ProcessorMetrics	1.x.x	Errata release. Clarified that metrics under <code>CurrentPeriod</code> are cleared when the <code>ClearCurrentPeriod</code> action is issued.
Redundancy	1.4.1	Errata release. Modified the permissions for <code>RedundancyType</code> within <code>RedundantGroup</code> to be writable.
Resource	1.x.x	Errata release. Clarified the patterns shown in the descriptions for the <code>DurableNameFormat</code> values are regular expression patterns.
Session	1.x.x	Errata release. Several typographic and consistency corrections.
Switch	1.5.2	Errata release. Corrected the release label for version 1.5.x of the schema.

### 3.4 Release 2021.4 (December 2021)

Schema name	Version	Description
ComponentIntegrity	1.0.0	Initial release. Resource that provides critical and pertinent security information about a specific device, system, software element, or other managed entity.
ManagerDiagnosticData	1.0.0	Initial release. Resource that provides internal diagnostic data for a manager.

Schema name	Version	Description
RegisteredClient	1.0.0	Initial release. Resource that represents a client instance that is monitoring the service.
ServiceConditions	1.0.0	Initial release. Resource that reports the conditions present in the service that require attention.
Cable	1.2.0	Added <code>CDFP</code> and <code>OSFP</code> to <code>CableType</code> .
Chassis	1.19.0	Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
Circuit	1.5.0	Added <code>UnbalancedVoltagePercent</code> , <code>UnbalancedCurrentPercent</code> , <code>PowerControlLocked</code> , <code>ConfigurationLocked</code> , and <code>PowerStateInTransition</code> properties. Added <code>PowerCycle</code> to <code>PowerState</code> parameter for <code>PowerControl</code> .
ComputerSystem	1.17.0	Added <code>OffloadedNetworkDeviceFunctions</code> to <code>Links</code> . Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
Control	1.1.0	Added <code>Pressure</code> and <code>FrequencyMHz</code> to <code>ControlType</code> .
Drive	1.14.0	Added <code>NetworkDeviceFunctions</code> to <code>Links</code> . Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
EnvironmentMetrics	1.2.0	Added <code>AbsoluteHumidity</code> and <code>EnergyJoules</code> properties.
EthernetInterface	1.8.0	Deprecated <code>Stateful</code> and <code>Stateless</code> for <code>OperatingMode</code> in <code>DHCPv6</code> in favor of <code>Enabled</code> .
Fabric	1.3.0	Added <code>UUID</code> property.
LogEntry	1.11.0	Added <code>Originator</code> and <code>OriginatorType</code> properties.
Manager	1.14.0	Added <code>ManagerDiagnosticData</code> property. Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
Memory	1.14.0	Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
NetworkAdapter	1.9.0	Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
NetworkDeviceFunction	1.8.0	Deprecated <code>PhysicalNetworkPortAssignment</code> at the root of the resource in favor of <code>PhysicalNetworkPortAssignment</code> within <code>Links</code> .
Outlet	1.4.0	Added <code>PowerControlLocked</code> , <code>ConfigurationLocked</code> , and <code>PowerStateInTransition</code> properties. Added <code>PowerCycle</code> to <code>PowerState</code> parameter for <code>PowerControl</code> .
OutletGroup	1.1.0	Added <code>PowerControlLocked</code> , <code>ConfigurationLocked</code> , and <code>PowerStateInTransition</code> properties. Added <code>PowerCycle</code> to <code>PowerState</code> parameter for <code>PowerControl</code> .
PCIeDevice	1.9.0	Added <code>slot</code> property to describe slot capabilities.
Port	1.6.0	Added <code>InfiniBand</code> property with <code>AssociatedPortGUIDs</code> , <code>AssociatedNodeGUIDs</code> , and <code>AssociatedSystemGUIDs</code> properties.

Schema name	Version	Description
PowerDistributionMetrics	1.3.0	Added <code>AbsoluteHumidity</code> property.
PowerSupply	1.3.0	Added <code>LineInputStatus</code> property.
Processor	1.14.0	Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
Resource	1.14.0	Added <code>Resolution to Conditions</code> . Added <code>MACAddress</code> to <code>DurableNameFormat</code> .
Sensor	1.5.0	Added <code>AbsoluteHumidity</code> and <code>PressurekPa</code> to <code>ReadingType</code> . Added <code>ApparentkVAh</code> , <code>ReactivekVARh</code> , and <code>PhaseAngleDegrees</code> properties.
ServiceRoot	1.13.0	Added <code>ComponentIntegrity</code> , <code>RegisteredClients</code> , and <code>ServiceConditions</code> properties.
SoftwareInventory	1.6.0	Deprecated <code>Measurement</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
Storage	1.12.0	Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
StorageController	1.5.0	Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
Switch	1.8.0	Deprecated <code>Measurements</code> in favor of reporting measurements in the <code>ComponentIntegrity</code> resource.
UpdateService	1.11.0	Added <code>ForceUpdate</code> to <code>SimpleUpdate</code> , multipart HTTP push updates, and <code>HttpPushUriOptions</code> . Added <code>OnStartUpdateRequest</code> to <code>ApplyTime</code> in <code>HttpPushUriApplyTime</code> .
Battery	1.0.1	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
BatteryMetrics	1.0.1	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
Circuit	1.x.x	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
Control	1.0.1	Errata release. Corrected usage of units in various descriptions for <code>ControlType</code> .
EnvironmentMetrics	1.x.x	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
EventDestination	1.x.x	Errata release. Clarified default behavior of <code>VerifyCertificate</code> .
Fan	1.x.x	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
Memory	1.13.1	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .

Schema name	Version	Description
Outlet	1.x.x	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
OutletGroup	1.0.2	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
PowerDistribution	1.x.x	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
PowerDistributionMetrics	1.x.x	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
PowerSupplyMetrics	1.0.1	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
Processor	1.13.1	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
ProcessorMetrics	1.x.x	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
Resource	1.x.x	Errata release. Clarified <code>AltitudeMeters</code> is the elevation above sea level.
Sensor	1.x.x	Errata release. Clarified <code>Altitude</code> is the elevation above sea level. Corrected usage of units in various descriptions for <code>ReadingType</code> . Corrected the minimum value for <code>PowerFactor</code> .
Settings	1.x.x	Errata release. Clarified the behavior of the <code>MaintenanceWindowStartTime</code> property when not initialized by a user.
ThermalMetrics	1.0.1	Errata release. Added normative ties to sensor and control excerpts to include requirements for the resource referenced by <code>DataSourceUri</code> .
UpdateService	1.x.x	Errata release. Clarified default behavior of <code>VerifyCertificate</code> .
VirtualMedia	1.x.x	Errata release. Clarified default behavior of <code>VerifyCertificate</code> .

### 3.5 Release 2021.3 (October 2021)

Schema name	Version	Description
Circuit	N/A	Added URIs for switchgear and electrical buses.
Outlet	N/A	Added URIs for electrical buses.
OutletGroup	N/A	Added URIs for power shelves and electrical buses.
PhysicalContext	N/A	Added <code>Pump</code> physical context type.

Schema name	Version	Description
PowerDistribution	N/A	Added URIs for electrical buses.
PowerDistributionMetrics	N/A	Added URIs for switchgear and electrical buses.
License	1.0.0	Initial release. Resource that represents a license installed on a service.
LicenseService	1.0.0	Initial release. Resource that allows clients to manage and install licenses on a service.
SwitchMetrics	1.0.0	Initial release. Resource that represents the usage and health statistics for a switch.
AggregationSource	1.2.0	Added <code>AggregationType</code> property. Added <code>TrapCommunity</code> to <code>SNMP</code> . Changed requirement for <code>HostName</code> to not be required if <code>AggregationType</code> contains <code>NotificationsOnly</code> .
Cable	1.1.0	Added <code>UserLabel</code> property.
Certificate	1.5.0	Added <code>SPDM</code> property with <code>SlotId</code> .
Chassis	1.18.0	Added <code>ElectricalSourceManagerURIs</code> and <code>ElectricalSourceNames</code> . Added <code>PowerOutlets</code> to <code>Links</code> .
Circuit	1.4.0	Added <code>Bus</code> to <code>CircuitType</code> . Added <code>UserLabel</code> , <code>ElectricalSourceManagerURI</code> , <code>ElectricalSourceName</code> , and <code>ElectricalConsumerNames</code> properties. Added <code>SourceCircuit</code> , <code>PowerOutlet</code> , and <code>DistributionCircuits</code> properties.
FabricAdapter	1.2.0	Added <code>PCIeDevices</code> to <code>Links</code> .
Facility	1.3.0	Added <code>ElectricalBuses</code> to <code>Links</code> .
LogEntry	1.10.0	Added <code>CPER</code> and <code>CPERSection</code> to <code>DiagnosticDataType</code> .
MessageRegistry	1.5.0	Added <code>VersionAdded</code> , <code>Deprecated</code> , and <code>VersionDeprecated</code> properties.
Outlet	1.3.0	Added <code>BusConnection</code> to <code>OutletType</code> . Added <code>UserLabel</code> and <code>ElectricalConsumerNames</code> properties. Added <code>DistributionCircuits</code> , <code>Chassis</code> , and <code>PowerSupplies</code> to <code>Links</code> .
PCIeDevice	1.8.0	Added common <code>PCIeErrors</code> object to be leveraged in other resources.
PCIeSlots	1.5.0	Added <code>Processors</code> to <code>Links</code> for each slot.
PowerDistribution	1.2.0	Added <code>Bus</code> to <code>PowerEquipmentType</code> .
PowerDomain	1.2.0	Added <code>ElectricalBuses</code> to <code>Links</code> .
PowerEquipment	1.2.0	Added <code>ElectricalBuses</code> property.
PowerSupply	1.2.0	Added <code>ElectricalSourceManagerURIs</code> and <code>ElectricalSourceNames</code> . Added <code>PowerOutlets</code> to <code>Links</code> .
ProcessorMetrics	1.4.0	Added <code>PCIeErrors</code> property.
ServiceRoot	1.12.0	Added <code>LicenseService</code> property.



Schema name	Version	Description
StorageController	1.4.0	Added <code>AllocatedSubmissionQueues</code> and <code>AllocatedCompletionQueues</code> to <code>NVMeControllerProperties</code> .
Switch	1.7.0	Added <code>Metrics</code> property.
AddressPool	1.x.x	Errata release. Clarified descriptions to various address range properties.
ComputerSystem	1.x.x	Errata release. Clarified <code>BootOrder</code> might require configuration with <code>@Redfish.Settings</code> .
EventDestination	1.x.x	Errata release. Clarified how to construct the value for <code>Destination</code> when the resource represents an SSE connection.
ManagerAccount	1.x.x	Errata release. Clarified <code>AccountTypes</code> describes the services the account is allowed to access on the manager.
MetricDefinition	1.x.x	Errata release. Several typographic and consistency corrections.

### 3.6 Release 2021.2 (August 2021)

Schema name	Version	Description
PhysicalContext	N/A	Added <code>Battery</code> physical context type.
AllowDeny	1.0.0	Initial release. Resource that contains address, port, and protocol allow-deny configuration settings for a network device.
Battery	1.0.0	Initial release. Resource that represents a battery module contained in a chassis.
BatteryMetrics	1.0.0	Initial release. Resource that contains metrics for a battery module.
Cable	1.0.0	Initial release. Resource that represents a cable within an implementation and describes connectivity to other resources.
Control	1.0.0	Initial release. Resource that contains information about a control point, including its set point, PID characteristics, and sensors that affect the control loop.
Key	1.0.0	Initial release. Resource that represents a key or other type of secret.
KeyPolicy	1.0.0	Initial release. Resource that contains usage restrictions for a key.
KeyService	1.0.0	Initial release. Resource that contains a service to manage keys in a Redfish implementation.
AccountService	1.10.0	Added <code>OAuth2</code> property for configuring OAuth 2.0 authorization. Added <code>OAuth2</code> to <code>AccountProviderType</code> .
ActionInfo	1.2.0	Added <code>ArraySizeMinimum</code> and <code>ArraySizeMaximum</code> properties.

Schema name	Version	Description
AddressPool	1.2.0	Added <code>Enabled</code> and <code>CIDR</code> to <code>BGPNeighbor</code> . Added <code>RouteDistinguisherAdministratorSubfield</code> , <code>RouteTargetAdministratorSubfield</code> , and <code>GatewayIPAddressRange</code> to <code>BGPVpn</code> . Added <code>SystemMACRange</code> to <code>IPv4</code> .
Certificate	1.4.0	Added <code>PEMchain</code> to <code>CertificateType</code> to support chain of PEM certificates. Added <code>CertificateUsageTypes</code> property. Added <code>Issuer</code> and <code>Subjects</code> in <code>Links</code> to report how certificates are chained.
Chassis	1.17.0	Added <code>Controls</code> property. Added <code>Cables</code> to <code>Links</code> .
Circuit	1.3.0	Added <code>PowerLoadPercent</code> property.
ComputerSystem	1.16.0	Added <code>IdlePowerSaver</code> property. Added <code>KeyManagement</code> property with <code>KMIPServers</code> and <code>KMIPCertificates</code> properties. Added <code>DPU</code> to <code>SystemType</code> . Deprecated <code>Status</code> in <code>ProcessorySummary</code> and <code>MemorySummary</code> in favor of <code>Status</code> in the individual resources.
Drive	1.13.0	Added <code>Storage</code> to <code>Links</code> .
EnvironmentMetrics	1.1.0	Added <code>PowerLoadPercent</code> , <code>DewPointCelsius</code> , and <code>PowerLimitWatts</code> properties.
EthernetInterface	1.7.0	Deprecated <code>VLANs</code> in favor of using multiple <code>EthernetInterface</code> resources to express additional VLANs. Deprecated <code>NetworkDeviceFunction</code> in favor of <code>NetworkDeviceFunctions</code> in <code>Links</code> .
Event	1.7.0	Added <code>LogEntry</code> property.
EventDestination	1.11.0	Added <code>SendHeartbeat</code> , <code>HeartbeatIntervalMinutes</code> , and <code>ClientCertificates</code> properties.
ExternalAccountProvider	1.3.0	Added <code>OAuth2Service</code> property for configuring OAuth 2.0 authorization. Added <code>OAuth2</code> and <code>TACACSplus</code> to <code>AccountProviderType</code> .
FabricAdapter	1.1.0	Added <code>Location</code> property.
Facility	1.2.0	Added <code>PowerShelves</code> to <code>Links</code> .
LogService	1.3.0	Added <code>LogEntriesETag</code> parameter to the <code>ClearLog</code> action. Added <code>AutoDSTEnabled</code> property.
Manager	1.13.0	Added <code>Certificates</code> and <code>Measurements</code> properties.
ManagerNetworkProtocol	1.8.0	Added <code>Proxy</code> for configuring proxy settings on the manager.
Memory	1.13.0	Added <code>Log</code> property for showing internal device logs. Added <code>OperatingSpeedRangeMHz</code> property.
NetworkAdapter	1.8.0	Added <code>Processors</code> property.
NetworkDeviceFunction	1.7.0	Added <code>SAVIEEnabled</code> , <code>Limits</code> , and <code>AllowDeny</code> properties. Added <code>EthernetInterfaces</code> property to <code>Ethernet</code> for showing non-system related interfaces. Added <code>OffloadSystem</code> and <code>OffloadProcessors</code> to <code>Links</code> . Deprecated <code>VLANs</code> in favor of using multiple <code>EthernetInterface</code> resources to express additional VLANs. Deprecated <code>EthernetInterface</code> in favor of <code>EthernetInterfaces</code> in <code>Links</code> .

Schema name	Version	Description
NetworkDeviceFunctionMetrics	1.1.0	Added <code>FibreChannel</code> property.
Outlet	1.2.0	Added <code>PowerLoadPercent</code> property.
Port	1.5.0	Added <code>WakeOnLANEnabled</code> and <code>EEEEnabled</code> properties. Added <code>Cables</code> to <code>Links</code> . Added several new values to <code>PortConnectionType</code> for Fibre Channel ports. Deprecated <code>SupportedEthernetCapabilities</code> in favor of showing individual properties for the configured capabilities.
PortMetrics	1.2.0	Added <code>FibreChannel</code> property.
PowerDistribution	1.1.0	Added <code>PowerShelf</code> to <code>PowerEquipmentType</code> . Added <code>PowerSupplies</code> , <code>PowerSupplyRedundancy</code> , and <code>MainsRedundancy</code> properties.
PowerDistributionMetrics	1.2.0	Added <code>PowerLoadPercent</code> property.
PowerDomain	1.1.0	Added <code>PowerShelves</code> to <code>Links</code> .
PowerEquipment	1.1.0	Added <code>PowerShelves</code> property.
PowerSubsystem	1.1.0	Added <code>Batteries</code> property.
Processor	1.13.0	Added <code>Ports</code> and <code>OperatingSpeedRangeMHz</code> properties. Added <code>ECCModeEnabled</code> to <code>MemorySummary</code> . Added <code>NetworkDeviceFunctions</code> to <code>Links</code> .
ProcessorMetrics	1.3.0	Added <code>CoreVoltage</code> property.
Resource	1.13.0	Added <code>Embedded</code> to <code>LocationType</code> . Added <code>Suspend</code> , <code>Pause</code> , and <code>Resume</code> to <code>ResetType</code> . Added <code>Paused</code> to <code>PowerState</code> .
Sensor	1.4.0	Added <code>SensorGroup</code> , <code>LowestReading</code> , <code>LowestReadingTime</code> , <code>AverageReading</code> , <code>AveragingInterval</code> , <code>AveragingIntervalAchieved</code> , <code>Calibration</code> , and <code>CalibrationTime</code> properties. Added <code>AssociatedControls</code> to <code>Links</code> . Added <code>EnergyWh</code> and <code>ChargeAh</code> to <code>ReadingType</code> .
ServiceRoot	1.11.0	Added <code>KeyService</code> and <code>Cables</code> properties.
SoftwareInventory	1.5.0	Added <code>MeasurementIndex</code> to <code>MeasurementBlock</code> .
Storage	1.11.0	Added <code>ResetToDefaults</code> action. Added <code>HostingStorageSystems</code> to <code>Links</code> .
StorageController	1.3.0	Added <code>NetworkDeviceFunctions</code> to <code>Links</code> .
Triggers	1.2.0	Added <code>MetricIds</code> property.
UpdateService	1.10.0	Added <code>ClientCertificates</code> property.
VirtualMedia	1.5.0	Added <code>ClientCertificates</code> property.

Schema name	Version	Description
VlanNetworkInterface	1.3.0	Deprecated the resource representation of <code>VlanNetworkInterface</code> in favor of using multiple <code>EthernetInterface</code> resources to express additional VLANs. Added <code>Tagged</code> property to common VLAN object.
AccountService	1.x.x	Errata release. Improved the resource description to indicate that there are scenarios where services may ignore certain policies to prevent denial of service or other types of lockouts.
ActionInfo	1.x.x	Errata release. Clarified that <code>AllowableValues</code> , <code>MinimumValue</code> , and <code>MaximumValue</code> describe constraints on array members for array parameters.
Drive	1.x.x	Errata release. Changed permissions of <code>HotSpareType</code> to be read-write. Specified the <code>Dedicated</code> value for <code>HotSpareType</code> is not allowed in client requests.
Endpoint	1.x.x	Errata release. Corrected a typographical error in the <code>SubsystemId</code> long description.
EventDestination	1.x.x	Errata release. Clarified the usage of <code>SyslogFilters</code> .
EventService	1.x.x	Errata release. Clarified the behavior of the service when <code>ServiceEnabled</code> contains <code>false</code> .
LogService	1.x.x	Errata release. Clarified the ordering of <code>DateTime</code> and <code>DateTimeLocalOffset</code> when both are modified in a single request. Several typographic and consistency corrections.
Manager	1.x.x	Errata release. Clarified the ordering of <code>DateTime</code> and <code>DateTimeLocalOffset</code> when both are modified in a single request.
Port	1.x.x	Errata release. Corrected the permissions of <code>LinkStatus</code> to be read-only.
PortMetrics	1.x.x	Errata release. Several typographic and consistency corrections.
Processor	1.x.x	Errata release. Clarified the usage of <code>TotalMemorySizeMiB</code> in <code>MemorySummary</code> .
ProcessorMetrics	1.x.x	Errata release. Clarified usage of <code>BandwidthPercent</code> to show it applies to all types of processors and not just CPUs.
Resource	1.x.x	Errata release. Corrected description of <code>LocationType</code> to remove duplicative statements.
Sensor	1.x.x	Errata release. Several typographic and consistency corrections. Clarified usage of <code>Synthesized</code> when multiple sensors are used to calculate the reading.
VirtualMedia	1.x.x	Errata release. Clarified usage of the <code>Image</code> parameter in the <code>InsertMedia</code> action and the <code>Image</code> property in the resource to show that relative URIs are allowed for media local to the service.

### 3.7 Release 2021.1 (April 2021)

Schema name	Version	Description
Endpoint	N/A	Added URI patterns to allow for endpoints to be subordinate to storage and storage services.
EndpointCollection	N/A	Added URI patterns to allow for endpoints to be subordinate to storage and storage services.
EnvironmentMetrics	N/A	Corrected URI patterns for instances where subordinate to resource blocks.
PhysicalContext	N/A	Added <code>Board</code> and <code>Transceiver</code> physical context types.
Privileges	N/A	Added <code>ConfigureCompositionInfrastructure</code> privilege.
Protocol	N/A	Added <code>NVLink</code> , <code>DisplayPort</code> , <code>HDMI</code> , <code>VGA</code> , and <code>DVI</code> protocols.
CompositionReservation	1.0.0	Initial release. Resource that represents reservation information related to the <code>Compose</code> action.
GraphicsController	1.0.0	Initial release. Resource that represents a controller that can be used to drive displays.
Manifest	1.0.0	Initial release. An object that describes a set of requests to be fulfilled.
NetworkAdapterMetrics	1.0.0	Initial release. Resource that represents the usage and health statistics for a network adapter.
NetworkDeviceFunctionMetrics	1.0.0	Initial release. Resource that represents the usage and health statistics for a network device function.
USBController	1.0.0	Initial release. Resource that represents a USB controller.
AccountService	1.9.0	Added <code>PasswordExpirationDays</code> property.
Bios	1.2.0	Added <code>ResetBiosToDefaultsPending</code> property.
Certificate	1.3.0	Added <code>SerialNumber</code> , <code>Fingerprint</code> , <code>FingerprintHashAlgorithm</code> , and <code>SignatureAlgorithm</code> properties.
Chassis	1.16.0	Added <code>SparePartNumber</code> property.
CollectionCapabilities	1.3.0	Added <code>ResourceBlockComposition</code> and <code>ResourceBlockConstrainedComposition</code> to <code>UseCase</code> .
CompositionService	1.2.0	Added <code>Compose</code> action. Added <code>ActivePool</code> , <code>FreePool</code> , <code>CompositionReservations</code> , and <code>ReservationDuration</code> properties.
ComputerSystem	1.15.0	Added <code>SetupEntered</code> to <code>LastState</code> within <code>BootProgress</code> . Added <code>PowerMode</code> , <code>GraphicsControllers</code> , and <code>USBControllers</code> properties. Added <code>StopBootOnFault</code> to <code>Boot</code> . Added <code>ThreadingEnabled</code> to <code>ProcessorSummary</code> .
Connection	1.1.0	Added <code>MemoryChunkInfo</code> and <code>ConnectionKeys</code> properties.

Schema name	Version	Description
Endpoint	1.6.0	Added <code>StorageSubsystem</code> to <code>EntityType</code> . Added <code>Zones</code> to <code>Links</code> . Deprecated <code>AccessKey</code> and <code>RegionKey</code> in favor of new properties in <code>Connection</code> .
Fan	1.1.0	Added <code>PowerWatts</code> property.
LogEntry	1.9.0	Added <code>ServiceProviderNotified</code> and <code>Resolution</code> properties.
Manager	1.12.0	Added <code>USBPorts</code> property.
ManagerAccount	1.8.0	Added <code>AccountExpiration</code> and <code>HostBootstrapAccount</code> properties.
MediaController	1.2.0	Added <code>EnvironmentMetrics</code> property.
Memory	1.12.0	Added <code>Enabled</code> property.
MetricDefinition	1.2.0	Added <code>String</code> to <code>MetricType</code> .
NetworkAdapter	1.7.0	Added <code>Metrics</code> , <code>EnvironmentMetrics</code> , and <code>LLDPEnabled</code> properties.
NetworkDeviceFunction	1.6.0	Added <code>Metrics</code> property.
PCIeDevice	1.7.0	Added <code>ReadyToRemove</code> and <code>EnvironmentMetrics</code> properties.
PCIeFunction	1.3.0	Added <code>Enabled</code> property.
Port	1.4.0	Added <code>FunctionMinBandwidth</code> , <code>FunctionMaxBandwidth</code> , <code>SFP</code> , and <code>EnvironmentMetrics</code> properties. Added <code>AssociatedMACAddresses</code> , <code>LLDPEnabled</code> , <code>LLDPTransmit</code> , and <code>LLDPReceive</code> to <code>Ethernet</code> . Added <code>AssociatedWorldWideNames</code> to <code>FibreChannel</code> .
PortMetrics	1.1.0	Added <code>RXBytes</code> , <code>TXBytes</code> , <code>RXErrors</code> , <code>TXErrors</code> , <code>Networking</code> , <code>Transceivers</code> , and <code>SAS</code> properties.
PowerDistributionMetrics	1.2.0	Added <code>TemperatureCelsius</code> and <code>HumidityPercent</code> properties.
PowerSupply	1.1.0	Added <code>Version</code> and <code>ProductionDate</code> properties.
Processor	1.12.0	Added <code>Enabled</code> property. Added <code>GraphicsController</code> to <code>Links</code> .
Resource	1.12.0	Deprecated <code>NSID</code> in favor of <code>NGUID</code> within <code>DurableNameFormat</code> .
ResourceBlock	1.4.0	Added <code>IndependentResource</code> to <code>ResourceBlockType</code> . Added <code>Pool</code> and <code>Client</code> properties. Added <code>ConsumingResourceBlocks</code> and <code>SupplyingResourceBlocks</code> to <code>Links</code> .
Sensor	1.3.0	Added <code>Links</code> property.
ServiceRoot	1.10.0	Added <code>NVMeDomains</code> property.
StorageController	1.2.0	Added <code>EnvironmentMetrics</code> property. Added <code>SupportsReservations</code> to <code>NVMeControllerAttributes</code> .
Switch	1.6.0	Added <code>Enabled</code> and <code>EnvironmentMetrics</code> properties.

Schema name	Version	Description
TaskService	1.2.0	Added <code>TaskAutoDeleteTimeoutMinutes</code> property.
UpdateService	1.9.0	Added <code>RemoteServerCertificates</code> and <code>VerifyRemoteServerCertificate</code> properties.
VirtualMedia	1.4.0	Added <code>Status</code> , <code>Certificates</code> , and <code>VerifyCertificate</code> properties.
Bios	1.x.x	Errata release. Clarified that the <code>ResetBios</code> action might clear pending values in a settings resource.
Certificate	1.2.3	Errata release. Clarified that <code>UefiSignatureOwner</code> applies to all UEFI-managed certificates.
ComputerSystem	1.x.x	Errata release. Clarified the behavior of <code>AliasBootOrder</code> with regards to handling multiple boot devices that map to the same alias. Clarified behavior of <code>BootSourceOverrideTarget</code> and <code>AliasBootOrder</code> to tie in virtual devices.
Endpoint	1.x.x	Errata release. Updated descriptions for the <code>EntityType</code> values to contain normative language consistent with other enumerations.
Manager	1.x.x	Errata release. Clarified that <code>RemoteAccountService</code> is for any type of remote manager and not just a Redfish manager.
NetworkDeviceFunction	1.x.x	Errata release. Added missing patterns for WWN properties.
Port	1.x.x	Errata release. Clarified that speed properties also include protocol overhead. Added missing patterns for WWN properties.
PowerDistributionMetrics	1.0.1	Errata release. Updated descriptions for <code>PowerWatts</code> and <code>EnergykWh</code> to be consistent with other metrics resources.
Resource	1.x.x	Errata release. Added patterns to descriptions for <code>DurableNameFormat</code> . Clarified descriptions in <code>PartLocation</code> .
SecureBootDatabase	1.0.1	Errata release. Corrected capitalization of <code>PKDefault</code> in the description for <code>DatabaseId</code> .
Triggers	1.1.4	Errata release. Clarified that <code>MetricType</code> is not used for event-based triggers.
(various files)	various	Errata release. Several typographic and consistency corrections. Reverted change for using "might" in favor of "may" in normative text. "May" is the appropriate term to use.

### 3.8 Release 2020.4 (December 2020)

Schema name	Version	Description
Assembly	N/A	Added URI patterns for <code>StorageController</code> resources. Corrected existing URI patterns for <code>StorageController</code> objects withing <code>Storage</code> resources.

Schema name	Version	Description
MemoryMetrics	N/A	Added URI patterns for memory metrics to be represented for the memory summary of a processor.
Port	N/A	Added URI patterns for ports to be represented within the <code>StorageController</code> resource.
PortCollection	N/A	Added URI patterns for ports to be represented within the <code>StorageController</code> resource.
RouteEntryCollection	N/A	Corrected spelling of "Fabric" in URI patterns.
RouteSetEntryCollection	N/A	Corrected spelling of "Fabric" in URI patterns.
EnvironmentMetrics	1.0.0	Initial release. Resource that contains environmental information for a device, such as temperature readings.
Fan	1.0.0	Initial release. Resource that contains information for a fan within a chassis. Replaces <code>Fans</code> array within the <code>Thermal</code> resource.
PowerSubsystem	1.0.0	Initial release. Resource that contains power related information within a chassis. Replaces the <code>Power</code> resource.
PowerSupply	1.0.0	Initial release. Resource that contains information for a power supply within a chassis. Replaces <code>PowerSupplies</code> array within the <code>Power</code> resource.
PowerSupplyMetrics	1.0.0	Initial release. Resource that contains metrics related information for a power supply within a chassis.
ThermalMetrics	1.0.0	Initial release. Resource that contains thermal related metrics for a chassis.
ThermalSubsystem	1.0.0	Initial release. Resource that contains thermal related information within a chassis. Replaces the <code>Thermal</code> resource.
AccountService	1.8.0	Added <code>RestrictedPrivileges</code> , <code>RestrictedOemPrivileges</code> , <code>SupportedAccountTypes</code> , and <code>SupportedOEMAccountTypes</code> properties. Added <code>TACACSplus</code> property for configuring external authentication via TACACS+. Added <code>Priority</code> property to external account providers.
AggregationSource	1.1.0	Added <code>SNMP</code> property for configuring SNMP aggregation sources.
Chassis	1.15.0	Added <code>Certificates</code> , <code>Measurements</code> , <code>PowerSubsystem</code> , <code>ThermalSubsystem</code> , and <code>EnvironmentMetrics</code> properties. Deprecated <code>Power</code> and <code>Thermal</code> in favor of the new <code>PowerSubsystem</code> , <code>ThermalSubsystem</code> , and <code>EnvironmentMetrics</code> properties.
Circuit	1.2.0	Added <code>DC48</code> to <code>NominalVoltageType</code> .
ComputerSystem	1.14.0	Added <code>Certificates</code> and <code>Measurements</code> properties. Added <code>TrustedModuleRequiredToBoot</code> to <code>Boot</code> . Added <code>CoreCount</code> to <code>ProcessorySummary</code> .
Drive	1.12.0	Added <code>Certificates</code> , <code>Measurements</code> , and <code>EnvironmentMetrics</code> properties.
EventDestination	1.10.0	Added <code>AuthenticationKeySet</code> and <code>EncryptionKeySet</code> properties. Added <code>HMAC128_SHA224</code> , <code>HMAC192_SHA256</code> , <code>HMAC256_SHA384</code> , and <code>HMAC384_SHA512</code> to <code>SNMPAuthenticationProtocols</code> . Added <code>RetryForeverWithBackoff</code> to <code>DeliveryRetryPolicy</code> .



Schema name	Version	Description
ExternalAccountProvider	1.2.0	Added <code>TACACSPplusService</code> property for configuring external authentication via TACACS+. Added <code>Priority</code> property.
Facility	1.1.0	Added <code>EnvironmentMetrics</code> and <code>AmbientMetrics</code> properties.
LogEntry	1.8.0	Added <code>Resolved</code> property.
Manager	1.11.0	Added <code>Location</code> , <code>LocationIndicatorActive</code> , and <code>SparePartNumber</code> properties.
ManagerAccount	1.7.0	Added <code>StrictAccountTypes</code> property. Added <code>HMAC128_SHA224</code> , <code>HMAC192_SHA256</code> , <code>HMAC256_SHA384</code> , and <code>HMAC384_SHA512</code> to <code>SNMPAuthenticationProtocols</code> . Extended <code>AccountTypes</code> enumeration to add <code>HostConsole</code> , <code>ManagerConsole</code> , <code>IPMI</code> , <code>KVMIP</code> , <code>VirtualMedia</code> , and <code>WebUI</code> .
Memory	1.11.0	Added <code>SparePartNumber</code> , <code>Model</code> , <code>Certificates</code> , <code>Measurements</code> , and <code>EnvironmentMetrics</code> properties. Added <code>Processors</code> to <code>Links</code> . Added <code>HBM3</code> , <code>GDDR</code> , <code>GDDR2</code> , <code>GDDR3</code> , <code>GDDR4</code> , <code>GDDR5</code> , <code>GDDR5X</code> , <code>GDDR6</code> , <code>DDR5</code> , and <code>OEM</code> to <code>MemoryDeviceType</code> .
MetricReportDefinition	1.4.0	Added <code>Oem</code> to <code>Metrics</code> .
NetworkAdapter	1.6.0	Added <code>Certificates</code> and <code>Measurements</code> properties.
NetworkPort	1.4.0	Deprecated schema in favor of <code>Port</code> schema.
PCIeDevice	1.6.0	Added <code>SparePartNumber</code> property.
PhysicalContext	N/A	Added <code>TrustedModule</code> physical context type.
Power	1.7.0	Deprecated schema in favor of new <code>PowerSubsystem</code> schema.
Processor	1.11.0	Added <code>MemorySummary</code> , <code>SparePartNumber</code> , <code>Certificates</code> , <code>Measurements</code> , and <code>EnvironmentMetrics</code> properties. Added <code>Memory</code> to <code>Links</code> .
ProcessorMetrics	1.2.0	Added <code>CacheMetrics</code> property. Added <code>ClearCurrentPeriod</code> for clearing the <code>CurrentPeriod</code> property within <code>CacheMetrics</code> . Deprecated temperature related properties in favor of the <code>EnvironmentMetrics</code> resource.
Redundancy	1.4.0	Added <code>RedundantGroup</code> definition to migrate away from using the <code>ReferenceableMember</code> definition for redundancy.
Resource	1.11.0	Added <code>Conditions</code> property to <code>Status</code> for showing details about what needs attention in a given resource.
Role	1.3.0	Added <code>Restricted</code> and <code>AlternateRoleId</code> properties.
Sensor	1.2.0	Added <code>RelatedItem</code> , <code>SpeedRPM</code> , and <code>DeviceName</code> properties. Added <code>UpperCautionUser</code> , <code>UpperCriticalUser</code> , <code>LowerCautionUser</code> , and <code>LowerCriticalUser</code> to <code>Thresholds</code> .
SoftwareInventory	1.4.0	Added <code>Measurement</code> property. Added <code>MeasurementBlock</code> definition for containing SPDM-related measurement information.
Storage	1.10.0	Added <code>Certificates</code> and <code>Measurements</code> to <code>StorageControllers</code> .

Schema name	Version	Description
StorageController	1.1.0	Added <code>Certificates</code> and <code>Measurements</code> properties.
Switch	1.5.0	Added <code>Certificates</code> and <code>Measurements</code> properties.
TelemetryService	1.3.0	Added <code>ClearMetricReports</code> , <code>ResetMetricReportDefinitionsToDefaults</code> , and <code>ResetTriggersToDefaults</code> actions.
Thermal	1.7.0	Deprecated schema in favor of new <code>ThermalSubsystem</code> schema.
VlanNetworkInterface	1.2.0	Added <code>VLANPriority</code> property.
Zone	1.6.0	Added <code>ZoneOfResourceBlocks</code> to <code>ZoneType</code> .
Event	1.x.x	Errata release. Updated descriptions to reference the "MessageId format" clause in the specification. Fixed description of <code>EventId</code> to be consistent with the specification.
EventDestination	1.x.x	Errata release. Clarified the descriptions for <code>EventFormatType</code> to specify the relationship with the <code>Protocol</code> property. Removed requirement for <code>DeliveryRetryPolicy</code> to have a default value if not specified.
Memory	1.x.x	Errata release. Removed the term "DC" from the description of the <code>IntelOptane</code> memory type.
Message	1.x.x	Errata release. Updated descriptions to reference the "MessageId format" clause in the specification.
MessageRegistry	1.x.x	Errata release. Clarified that <code>Severity</code> and <code>MessageSeverity</code> can be replaced in events and messages by a value determined by the service.
MetricReport	1.x.x	Errata release. Clarified behavior for when a metric report is deleted.
NetworkDeviceFunction	1.x.x	Errata release. Corrected the description for the <code>iSCSI</code> value for <code>BootMode</code> to allow for Ethernet devices.
PCIeSlots	1.4.1	Errata release. Corrected the placement of the <code>LocationIndicatorActive</code> to be within a given slot.
(various files)	various	Errata release. Several typographic and consistency corrections. Removed non-normative term "must" from long descriptions. Regenerated several schemas to mark integer properties as 64-bit in OpenAPI definitions.

### 3.9 Release 2020.3 (August 2020)

Schema name	Version	Description
Connection	1.0.0	Initial release. A resource to describe the access permissions endpoints, or groups of endpoints, have with other resources in the service.
StorageController	1.0.0	Initial release. A resource to describe a storage controller.

Schema name	Version	Description
Port	N/A	Added URI patterns for ports to be represented within network interfaces and network adapters.
PortCollection	N/A	Added URI patterns for ports to be represented within network interfaces and network adapters.
VirtualMedia	N/A	Added URI patterns for virtual media to be represented within a computer system.
VirtualMediaCollection	N/A	Added URI patterns for virtual media to be represented within a computer system.
AddressPool	1.1.0	Added <code>Ethernet</code> property.
Assembly	1.3.0	Added <code>LocationIndicatorActive</code> and <code>Location</code> properties.
Chassis	1.14.0	Added <code>LocationIndicatorActive</code> and <code>Drives</code> properties. Deprecated <code>IndicatorLED</code> in favor of <code>LocationIndicatorActive</code> .
Circuit	1.1.0	Added <code>LocationIndicatorActive</code> property. Deprecated <code>IndicatorLED</code> in favor of <code>LocationIndicatorActive</code> .
ComputerSystem	1.13.0	Added <code>LocationIndicatorActive</code> , <code>BootProgress</code> , <code>SerialConsole</code> , <code>GraphicalConsole</code> , <code>VirtualMediaConfig</code> , <code>VirtualMedia</code> , <code>PowerOnDelaySeconds</code> , <code>PowerOffDelaySeconds</code> , and <code>PowerCycleDelaySeconds</code> properties. Deprecated <code>IndicatorLED</code> in favor of <code>LocationIndicatorActive</code> .
Drive	1.11.0	Added <code>LocationIndicatorActive</code> property. Deprecated <code>IndicatorLED</code> in favor of <code>LocationIndicatorActive</code> .
Endpoint	1.5.0	Added <code>Manager</code> to <code>EntityType</code> . Added <code>Connections</code> to <code>Links</code> .
EndpointGroup	1.3.0	Initial transition from SNIA. Deprecated <code>AccessState</code> in favor of <code>AccessState</code> in <code>Connection</code> . Deprecated <code>Endpoints</code> in favor of <code>Endpoints</code> in <code>Links</code> . Deprecated <code>Client</code> and <code>Server</code> in favor of <code>Initiator</code> and <code>Target</code> . Added <code>Connections</code> to <code>Links</code> .
Event	1.6.0	Added <code>SpecificEventExistsInGroup</code> property.
EventDestination	1.9.0	Added <code>Certificates</code> , <code>VerifyCertificate</code> , <code>SyslogFilters</code> , <code>OEMProtocol</code> , and <code>OEMSubscriptionType</code> properties. Added syslog related values to <code>Protocol</code> and <code>SubscriptionType</code> .
Fabric	1.2.0	Added <code>Connections</code> and <code>EndpointGroups</code> properties.
HostInterface	1.3.0	Added <code>CredentialBootstrapping</code> property. Added <code>CredentialBootstrappingRole</code> to <code>Links</code> . Deprecated <code>KernelAuthRoleId</code> , <code>KernelAuthEnabled</code> , <code>FirmwareAuthRoleId</code> , <code>FirmwareAuthEnabled</code> , <code>KernelAuthRole</code> , and <code>FirmwareAuthRole</code> in favor of new credential bootstrapping properties.
LogEntry	1.7.0	Added <code>AdditionalDataSizeBytes</code> , <code>AdditionalDataURI</code> , <code>DiagnosticDataType</code> , and <code>OEMDiagnosticDataType</code> properties.
LogService	1.2.0	Added <code>CollectDiagnosticData</code> action. Added <code>SyslogFilters</code> property.
Manager	1.10.0	Added <code>TimeZoneName</code> property. Deprecated <code>VirtualMedia</code> and <code>SerialConsole</code> properties in favor of those added to <code>ComputerSystem</code> .

Schema name	Version	Description
Memory	1.10.0	Added <code>LocationIndicatorActive</code> property.
MemoryChunks	1.4.0	Added <code>DisplayName</code> property.
MemoryMetrics	1.4.0	Added <code>CorrectableECCErrorCount</code> and <code>UncorrectableECCErrorCount</code> properties to <code>CurrentPeriod</code> and <code>LifeTime</code> .
MetricDefinition	1.1.0	Added <code>OEM</code> to <code>CalculationAlgorithm</code> . Added <code>OEMCalculationAlgorithm</code> property.
NetworkAdapter	1.5.0	Deprecated <code>NetworkPorts</code> in favor of <code>Ports</code> to leverage the common <code>Port</code> schema.
NetworkDeviceFunction	1.5.0	Added <code>InfiniBand</code> property. Deprecated <code>AssignablePhysicalPorts</code> and <code>PhysicalPortAssignment</code> in favor of <code>AssignablePhysicalNetworkPorts</code> and <code>PhysicalNetworkPortAssignment</code> to leverage the common <code>Port</code> schema. Added <code>MTUSizeMaximum</code> property to <code>Ethernet</code> .
NetworkInterface	1.2.0	Deprecated <code>NetworkPorts</code> in favor of <code>Ports</code> to leverage the common <code>Port</code> schema.
NetworkPort	1.3.0	Added <code>Starting</code> and <code>Training</code> values to <code>LinkStatus</code> .
Outlet	1.1.0	Added <code>LocationIndicatorActive</code> property. Deprecated <code>IndicatorLED</code> in favor of <code>LocationIndicatorActive</code> .
PCleDevice	1.5.0	Added <code>UUID</code> property.
PCleSlots	1.4.0	Added <code>LocationIndicatorActive</code> property.
Port	1.3.0	Added <code>LocationIndicatorActive</code> , <code>MaxFrameSize</code> , <code>LinkConfiguration</code> , <code>FibreChannel</code> , and <code>Ethernet</code> properties.
Processor	1.10.0	Added <code>LocationIndicatorActive</code> , <code>BaseSpeedMHz</code> , <code>SpeedLimitMHz</code> , and <code>SpeedLocked</code> properties. Added <code>ProtectedIdentificationNumber</code> to <code>ProcessorId</code> .
Protocol	N/A	Added <code>Ethernet</code> and <code>InfiniBand</code> protocols.
Resource	1.10.0	Added <code>NGUID</code> to <code>DurableNameFormat</code> .
ServiceRoot	1.9.0	Added <code>Storage</code> property.
Session	1.3.0	Added <code>ClientOriginIPAddress</code> property.
SimpleStorage	1.3.0	Added <code>Storage</code> to <code>Links</code> .
Storage	1.9.0	Added URI pattern to allow for storage instances to be beneath service root. Added <code>Controllers</code> and <code>Identifiers</code> properties. Added <code>SimpleStorage</code> and <code>StorageServices</code> to <code>Links</code> .
Switch	1.4.0	Added <code>LocationIndicatorActive</code> , <code>CurrentBandwidthGbps</code> , and <code>MaxBandwidthGbps</code> properties. Added <code>PCleDevice</code> property to <code>Links</code> . Deprecated <code>IndicatorLED</code> in favor of <code>LocationIndicatorActive</code> .
Task	1.5.0	Added <code>SubTasks</code> property.
Zone	1.5.0	Added <code>AddEndpoint</code> and <code>RemoveEndpoint</code> actions.

Schema name	Version	Description
AddressPool	1.0.1	Errata release. Several typographic and consistency corrections.
AccountService	1.x.x	Errata release. Clarified that <code>MinPasswordLength</code> and <code>MaxPasswordLength</code> do not apply to external accounts. Fixed permissions for <code>MinPasswordLength</code> and <code>MaxPasswordLength</code> to be writable. Clarified that <code>AuthFailureLoggingThreshold</code> applies per account.
AttributeRegistry	1.x.x	Errata release. Clarified the evaluation order for Dependencies containing multiple logic expressions.
Chassis	1.x.x	Errata release. Added recommendation for using <code>@Redfish.AllowableValues</code> for <code>ResetType</code> for compatibility with older clients.
ComputerSystem	1.x.x	Errata release. Removed restriction in the <code>UefiTargetBootSourceOverride</code> to allow for <code>Continuous</code> to be used with <code>UefiTarget</code> . Clarified that <code>ProcessorySummary</code> only contains processors that execute system code. Added recommendation for using <code>@Redfish.AllowableValues</code> for <code>ResetType</code> for compatibility with older clients.
EthernetInterface	1.x.x	Errata release. Clarified several descriptions to state the difference between IP addresses that are currently in use versus addresses that are requested to be assigned.
Event	1.x.x	Errata release. Clarified that <code>Severity</code> and <code>MessageSeverity</code> in responses can be service-defined and not come from a message registry.
IPAddresses	1.x.x	Errata release. Clarified the description of the IPv4 <code>Gateway</code> property to show that there should only be one gateway per interface if multiple addresses are allowed.
Job	1.0.5	Errata release. Clarified that steps of jobs cannot have their own steps.
LogEntry	1.x.x	Errata release. Corrected the description for <code>SensorNumber</code> to show that it only applies for entries of type <code>SEL</code> .
Manager	1.x.x	Errata release. Added recommendation for using <code>@Redfish.AllowableValues</code> for <code>ResetType</code> for compatibility with older clients.
ManagerAccount	1.x.x	Errata release. Corrected the description for <code>EncryptionKey</code> .
ManagerNetworkProtocol	1.x.x	Errata release. Clarified the SNMP <code>AuthenticationProtocol</code> property does not apply when <code>EncryptionProtocol</code> contains the value <code>Account</code> and instead is determined based on the settings of individual accounts. Clarified usage of <code>VirtualMedia</code> and <code>KVMIP</code> properties that they apply to all systems managed by the manager.
Memory	1.x.x	Errata release. Clarified various descriptions to show properties are for the memory device.
Message	1.x.x	Errata release. Clarified that <code>Resolution</code> , <code>Severity</code> , and <code>MessageSeverity</code> in responses can be service-defined and not come from a message registry.
MessageRegistry	1.x.x	Errata release. Clarified that <code>Resolution</code> , <code>Severity</code> , and <code>MessageSeverity</code> in responses can be service-defined and not come from a message registry.
MetricDefinition	1.0.5	Errata release. Clarified <code>CalculationParameters</code> to show it should be used when <code>ImplementationType</code> is <code>Synthesized</code> or <code>Calculated</code> .

Schema name	Version	Description
MetricReportDefinition	1.x.x	Errata release. Corrected permissions for <code>ReportActions</code> , <code>ReportUpdates</code> , <code>MetricId</code> , and properties in <code>wildcards</code> to be writable.
OperatingConfig	1.0.1	Errata release. Clarified the description for <code>BaseSpeedMHz</code> to show it's the nominal speed.
Port	1.2.2	Errata release. Clarified the descriptions for <code>Starting</code> and <code>Training</code> .
Resource	1.9.3	Errata release. Added long descriptions to all reset type values.
Settings	1.x.x	Errata release. Clarified usage of the <code>SupportedApplyTimes</code> property to state that having a single member is valid for conveying a non-configurable apply time.
Signature	1.0.1	Errata release. Several typographic and consistency corrections.
UpdateService	1.x.x	Errata release. Clarified the descriptions of <code>FirmwareInventory</code> and <code>SoftwareInventory</code> to explain the types of members to find in their respective collections. Clarified that <code>TransferProtocol</code> in <code>SimpleUpdate</code> is ignored if the scheme is provided in the URI.
(various files)	various	Errata release. Corrected permissions and update capabilities for several resources.

### 3.10 Release 2020.2 (April 2020)

Schema name	Version	Description
Aggregate	1.0.0	Initial release. A resource to groupings of other resources in order to consolidate operations for large sets of resources.
AggregationService	1.0.0	Initial release. A resource to control how a service can access southbound interfaces for aggregating interfaces and manage sets of resources.
AggregationSource	1.0.0	Initial release. A resource that describes the address and credentials required by an aggregator when interfacing with southbound services.
ConnectionMethod	1.0.0	Initial release. A resource that describes the method used by an aggregator to interface with a southbound service.
OperatingConfig	1.0.0	Initial release. A resource that contains configuration settings that can be applied to a given processor.
ComputerSystem	1.12.0	Added <code>LastResetTime</code> property.
Drive	1.10.0	Added <code>ReadyToRemove</code> property.
Event	1.5.0	Added <code>MessageSeverity</code> property. Deprecated <code>Severity</code> in favor of <code>MessageSeverity</code> .
EventService	1.7.0	Deprecated <code>Login</code> enumeration in <code>SMTPAuthenticationMethods</code> in favor of <code>Plain</code> .

Schema name	Version	Description
Manager	1.9.0	Added <code>LastResetTime</code> property. Added <code>ManagedBy</code> and <code>ManagerForManagers</code> properties to <code>Links</code> .
MediaController	1.1.0	Added <code>UUID</code> property.
MetricReport	1.4.0	Added <code>Context</code> property.
NetworkAdapter	1.4.0	Added <code>Location</code> and <code>Identifiers</code> properties for the overall network adapter.
Processor	1.9.0	Deprecated <code>FirmwareVersion</code> in <code>FPGA</code> in favor of <code>FirmwareVersion</code> at the root of the resource. Added <code>TurboState</code> , <code>BaseSpeedPriorityState</code> , <code>HighSpeedCoreIDs</code> , <code>OperatingConfigs</code> , and <code>AppliedOperatingConfig</code> properties.
ServiceRoot	1.8.0	Added <code>AggregationService</code> property.
AccountService	1.x.x	Errata release. Clarified the description for <code>AuthFailureLoggingThreshold</code> .
ComputerSystem	1.x.x	Errata release. Removed confusing text in the long description for <code>BootSourceOverrideEnable</code> that mentioned a general restriction with regards to <code>Continuous</code> and <code>UEFI</code> .
NetworkAdapter	1.x.x	Errata release. Clarified the <code>Location</code> and <code>Identifiers</code> properties inside <code>Controllers</code> are for the controller and not the overall adapter.
(various files)	various	Errata release. Several typographic and consistency corrections.

### 3.11 Release 2020.1 (March 2020)

Schema name	Version	Description
Chassis	N/A	Updated capabilities to allow for deleting <code>Chassis</code> resources.
ChassisCollection	N/A	Updated capabilities to allow for creating <code>Chassis</code> resources.
PCleDevice	N/A	Added URI patterns for PCIe devices to be represented within resource blocks.
PCleDeviceCollection	N/A	Added URI patterns for PCIe devices to be represented within resource blocks.
PCleFunction	N/A	Added URI patterns for PCIe functions to be represented within resource blocks.
PCleFunctionCollection	N/A	Added URI patterns for PCIe functions to be represented within resource blocks.
SecureBootDatabase	1.0.0	Initial release. A resource to manage UEFI Secure Boot databases.
Signature	1.0.0	Initial release. A resource to describe a signature or hash.
Certificate	1.2.0	Added <code>UefiSignatureOwner</code> property.
Chassis	1.12.0	Added <code>MaxPowerWatts</code> and <code>MinPowerWatts</code> properties.

Schema name	Version	Description
ComputerSystem	1.11.0	Added <code>AutomaticRetryConfig</code> , <code>AutomaticRetryAttempts</code> , and <code>RemainingAutomaticRetryAttempts</code> to <code>Boot</code> .
EthernetInterface	1.6.0	Added <code>EthernetInterfaceType</code> property. Added <code>NetworkDeviceFunction</code> to <code>Links</code> .
EventDestination	1.8.0	Added <code>IncludeOriginOfCondition</code> property.
EventService	1.5.0	Added <code>IncludeOriginOfConditionSupported</code> property.
LogEntry	1.6.0	Added <code>Modified</code> property.
Manager	1.8.0	Added <code>ResetToDefaults</code> action.
ManagerAccount	1.6.0	Added <code>PasswordExpiration</code> property.
ManagerNetworkProtocol	1.6.0	Added <code>ArchitectureId</code> to <code>EngineId</code> .
MemoryMetrics	1.3.0	Added <code>OperatingSpeedMHz</code> property.
MessageRegistry	1.4.0	Added <code>MessageSeverity</code> property. Deprecated <code>Severity</code> in favor of <code>MessageSeverity</code> .
NetworkDeviceFunction	1.4.0	Added <code>EthernetInterface</code> to <code>Links</code> .
PCleSlots	1.3.0	Added <code>U2</code> value to <code>PCIESlotType</code> .
Processor	1.8.0	Added <code>SystemInterface</code> , <code>OperatingSpeedMHz</code> , and <code>MinSpeedMHz</code> properties. Added <code>AMBA</code> , <code>CCIX</code> , and <code>CXL</code> values to the interface type enumeration.
ProcessorMetrics	1.1.0	Added <code>OperatingSpeedMHz</code> property. Deprecated <code>AverageFrequencyMHz</code> in favor of <code>OperatingSpeedMHz</code> .
SecureBoot	1.1.0	Added <code>SecureBootDatabases</code> property.
ServiceRoot	1.7.0	Added <code>DeepOperations</code> property.
SoftwareInventory	1.3.0	Added <code>WriteProtected</code> property.
Event	1.x.x	Errata release. Updated description for <code>OriginOfCondition</code> to show that a subscriber can request the full resource for the origin of the event to be included in the event itself.
ManagerAccount	1.x.x	Errata release. Corrected formats for <code>AuthenticationKey</code> and <code>EncryptionKey</code> within <code>SNMP</code> to support patterns defined in RFC3414.
ManagerNetworkProtocol	1.x.x	Errata release. Clarified <code>EnterpriseSpecificMethod</code> is tied to the "type 2 format" of the RFC3411-defined <code>snmpEngineID</code> . Made <code>PrivateEnterpriseId</code> and <code>EnterpriseSpecificMethod</code> read-only.
MemoryMetrics	1.x.x	Errata release. Corrected description of <code>HealthData</code> to allow its usage with regards to being metrics for a memory summary.



Schema name	Version	Description
MetricReportDefinition	1.x.x	Errata release. Clarified that <code>ReportUpdates</code> and <code>ReportActions</code> should be ignored when <code>MetricReportDefinitionType</code> is <code>OnRequest</code> . Clarified behavior of some properties when a metric report stops. Clarified <code>ReportTimespan</code> is the maximum time span the report can cover.
SecureBoot	1.x.x	Errata release. Updated descriptions as needed to reference UEFI Secure Boot databases.
TaskService	1.x.x	Errata release. Clarified <code>LifeCycleEventOnTaskStateChange</code> to reference the Task Event Message Registry for task events.
(various files)	various	Errata release. Several typographic and consistency corrections.

### 3.12 Release 2019.4 (December 2019)

Schema name	Version	Description
(un-versioned JSON Schema)	N/A	Removed down-revision errata schema references from <code>anyOf</code> arrays in un-versioned JSON Schema files to significantly improve schema tool performance and avoid known and addressed schema errata.
AddressPool	1.0.0	Initial release. A resource to describe pools for addressable memory for a fabric.
Circuit	1.0.0	Initial release. A resource to describe an electrical circuit in power equipment.
FabricAdapter	1.0.0	Initial release. A resource to describe an adapter for fabric connectivity.
Facility	1.0.0	Initial release. A resource to describe a room, floor, building, or site containing equipment.
MediaController	1.0.0	Initial release. A resource to describe a media controller.
Outlet	1.0.0	Initial release. A resource to describe an electrical outlet in power equipment.
OutletGroup	1.0.0	Initial release. A resource to describe a group of electrical outlets in power equipment.
PortMetrics	1.0.0	Initial release. A resource to collect metrics associated with a port.
PowerDistribution	1.0.0	Initial release. A resource to describe a power distribution component or unit, such as a floor PDU, rack PDU, transfer switch, or switchgear.
PowerDistributionMetrics	1.0.0	Initial release. A resource to collect metrics for a power distribution component or unit.
PowerDomain	1.0.0	Initial release. A resource to show power equipment within the same domain.
PowerEquipment	1.0.0	Initial release. A resource to show the power equipment being tracked by a service.
RouteEntry	1.0.0	Initial release. A resource to report and configure a set of routes for a switch or port.
RouteSetEntry	1.0.0	Initial release. A resource to report and configure a specific route in a route entry for a switch or port.

Schema name	Version	Description
VCATEntry	1.0.0	Initial release. A resource to report and configure a Virtual Action Table entry.
AccountService	1.7.0	Added PasswordSet to LDAP and ActiveDirectory .
Chassis	1.11.0	Added MediaControllers , Memory , and MemoryDomains properties. Added Facility to Links .
ComputerSystem	1.10.0	Added Appliance , BareMetalServer , VirtualMachineServer , and ContainerServer values to HostingRoles . Added FabricAdapters property.
Drive	1.9.0	Added Multipath property.
Endpoint	1.4.0	Added GenZ property. Added MediaController , MemoryChunk , Switch , and FabricBridge values to EntityType .
Fabric	1.1.0	Added AddressPools property.
Manager	1.7.0	Added Manufacturer , SerialNumber , and PartNumber properties.
ManagerAccount	1.5.0	Added AuthenticationKeySet and EncryptionKeySet properties to SNMP .
Memory	1.9.0	Deprecated DeviceLocation ; Location should be used in its place.
MemoryChunks	1.3.0	Added AddressRangeOffsetMiB and Links properties.
MemoryDomain	1.3.0	Added Links property.
MetricReport	1.3.0	Deprecated ReportSequence based on client feedback with usage of SSE id .
PCleSlots	1.2.0	Added OCP3Small and OCP3Large values for SlotType .
Port	1.2.0	Added PortMedium , LinkNetworkTechnology , InterfaceEnabled , SignalDetected , LinkTransitionIndicator , ActiveWidth , LinkState , LinkStatus , GenZ , and Metrics properties.
Processor	1.7.0	Added SerialNumber , PartNumber , Version , and FirmwareVersion properties.
Protocol	N/A	Added MultiProtocol and GenZ protocols.
Resource	1.9.0	Added Qualified value to State .
Sensor	1.1.0	Added CrestFactor , THDPercent , LifetimeReading , SensingInterval , ReadingTime , and Implementation .
ServiceRoot	1.6.0	Added PowerEquipment and Facilities properties.
Switch	1.3.0	Added SupportedProtocols and UUID properties. Added Endpoints to Links . Updated description for SwitchType to guide users to use SupportedProtocols for multi-protocol switches.
TelemetryService	1.2.0	Added ServiceEnabled property.
Thermal	1.6.0	Added UpperThresholdUser and LowerThresholdUser to Temperatures .
UpdateService	1.8.0	Added Oem to UpdateParameters .

Schema name	Version	Description
Zone	1.4.0	Added <code>ZoneType</code> and <code>DefaultRoutingEnabled</code> properties. Added <code>AddressPools</code> , <code>ContainedByZones</code> , and <code>ContainsZones</code> to <code>Links</code> .
Assembly	1.x.x	Errata release. Clarified <code>version</code> property to state it refers to the version of hardware.
ComputerSystem	1.x.x	Errata release. Corrected description for <code>UefiTargetBootSourceOverride</code> to remove erroneous mention of <code>@Redfish.AllowableValues</code> .
IPAddress	1.x.x	Errata release. Corrected minimum term on <code>PrefixLength</code> .
LogEntry	1.x.x	Errata release. Clarified several references to the IPMI Specification to show a specific version of the specification.
ManagerAccount	1.x.x	Errata release. Removed incorrect clause that tied <code>Enabled</code> and <code>Locked</code> together.
PCleSlots	1.x.x	Errata release. Corrected typo in the description for <code>Location</code> .
Processor	1.x.x	Errata release. Corrected typos in several property descriptions.
Resource	N/A	Errata release. Extended <code>InTest</code> state to mention <code>capturing information</code> .
Sensor	1.0.4	Errata release. Corrected action to reset metrics to be named <code>ResetMetrics</code> .
Task	1.x.x	Errata release. Clarified the behavioral aspects of <code>HidePayload</code> and <code>Payload</code> .

### 3.13 Release 2019.3 (October 2019)

Schema name	Version	Description
ComputerSystem	1.9.0	Added <code>HttpBootUri</code> to <code>Boot</code> .
Drive	1.8.0	Added <code>StoragePools</code> to <code>Links</code> .
EventDestination	1.7.0	Added properties to support SMTP and SNMP event delivery.
EventService	1.5.0	Added properties to support SMTP event delivery.
LogEntry	1.5.0	Added <code>GeneratorId</code> property.
ManagerAccount	1.4.0	Added properties to support access to SNMP services.
ManagerNetworkProtocol	1.5.0	Added properties to support SNMP services.
Power	1.6.0	Added <code>PowerSupplyReset</code> action.
Privileges	N/A	Added <code>NoAuth</code> privilege.
Processor	1.6.0	Added <code>Reset</code> action.

Schema name	Version	Description
Protocol	N/A	Added <code>TCP</code> , <code>UDP</code> , and <code>TFTP</code> protocols.
Settings	1.3.0	Added <code>OnStartUpdateRequest</code> to the <code>OperationApplyTime</code> enumeration.
Storage	1.8.0	Added <code>FileSystems</code> , <code>StoragePools</code> , <code>StorageGroups</code> , <code>EndpointGroups</code> , and <code>ConsistencyGroups</code> properties.
UpdateService	1.7.0	Added <code>StartUpdate</code> action.
LogEntry	1.x.x	Errata release. Modified description of <code>MessageId</code> to include the Event Type/Event Direction byte in the string for SEL type entries.
Privileges	N/A	Errata release. Clarified the description for <code>ConfigureSelf</code> to show that it's also used for users to log out of their own sessions.
Processor	1.x.x	Errata release. Removed <code>CPUID</code> term from the <code>IdentificationRegisters</code> description in order to not be tied to x86 processors.
Resource	1.8.3	Errata release. Removed <code>Excerpt</code> annotation from common <code>Name</code> property.
Sensor	1.0.3	Errata release. Corrected units for <code>ApparentVA</code> and <code>ReactiveVAR</code> properties. Fixed several <code>Excerpt</code> annotations.

### 3.14 Release 2019.2 (August 2019)

Schema name	Version	Description
AccountService	1.6.0	Added <code>LocalFirst</code> to the <code>LocalAccountAuth</code> enumeration.
Bios	1.1.0	Added <code>SoftwareImages</code> and <code>ActiveSoftwareImage</code> properties to <code>Links</code> .
Chassis	1.10.0	Deprecated <code>PCIeDevices</code> array inside <code>Links</code> in favor of new <code>PCIeDevices</code> resource collection.
CollectionCapabilities	1.2.0	Added <code>MaxMembers</code> property.
ComputerSystem	1.8.0	Added <code>Metrics</code> property to <code>MemorySummary</code> .
Drive	1.7.0	Added <code>WriteCacheEnabled</code> property. Added <code>Reset</code> action.
EventDestination	1.6.0	Added <code>DeliveryRetryPolicy</code> , <code>Status</code> , and <code>MetricReportDefinitions</code> properties. Added <code>ResumeSubscription</code> action.
EventService	1.4.0	Added <code>SubordinateResources</code> property to <code>SSEFilterPropertiesSupported</code> .
Manager	1.6.0	Added <code>SoftwareImages</code> and <code>ActiveSoftwareImage</code> properties to <code>Links</code> .
Memory	1.8.0	Added <code>Reset</code> action.

Schema name	Version	Description
MemoryMetrics	1.2.0	Added <code>BandwidthPercent</code> property.
MetricReport	1.2.0	Added <code>Oem</code> property to <code>MetricValues</code> .
MetricReportDefinition	1.3.0	Added <code>ReportTimespan</code> property.
NetworkAdapter	1.3.0	Added <code>Identifiers</code> property to <code>Controllers</code> .
PCleDevice	1.4.0	Deprecated <code>PCIEFunctions</code> array inside <code>Links</code> in favor of new <code>PCIEFunctions</code> resource collection.
Switch	1.2.0	Added <code>FirmwareVersion</code> property.
UpdateService	1.6.0	Added <code>MultipartHttpPushUri</code> property for performing an update using HTTP multipart forms with additional semantics specified in the Redfish Specification.
Assembly	1.x.x	Errata release. Clarified that the <code>BinaryDataUri</code> reference is accessed using Redfish protocol semantics.
AccountService	1.x.x	Errata release. Clarified that the <code>LDAPService</code> property should only be used in the context of LDAP services.
EthernetInterface	1.x.x	Errata release. Fixed several properties to allow for <code>null</code> so that services can advertise the size of configurable arrays. Clarified the description of the <code>SpeedMbps</code> property to state that it's writable only when <code>AutoNeg</code> is false.
Event	1.x.x	Errata release. Clarified the description of <code>EventId</code> to give guidance on its usage. Added semantics of when <code>EventGroupId</code> is 0.
EventService	1.x.x	Errata release. Fixed parameters in <code>SubmitTestEvent</code> so that only <code>MessageId</code> is required. Added language to <code>DeliveryRetryAttempts</code> to show how it ties to the <code>DeliveryRetryPolicy</code> property in <code>EventDestination</code> .
ExternalAccountProvider	1.x.x	Errata release. Clarified that the <code>LDAPService</code> property should only be used in the context of LDAP services.
Job	1.x.x	Errata release. Fixed <code>EndTime</code> property to not allow for <code>null</code> .
JsonSchemaFile	1.x.x	Errata release. Clarified that the <code>Uri</code> and <code>ArchiveUri</code> references are accessed using Redfish protocol semantics.
MessageRegistry	1.x.x	Errata release. Fixed several descriptions to call out "registry" instead of "schema".
MessageRegistryFile	1.x.x	Errata release. Clarified that the <code>Uri</code> and <code>ArchiveUri</code> references are accessed using Redfish protocol semantics.
MetricReportDefinition	1.x.x	Errata release. Corrected descriptions in the <code>CalculationAlgorithmEnum</code> enum.
NetworkDeviceFunction	1.x.x	Errata release. Added missing regex pattern for MAC address properties.
PCleSlots	1.1.1	Errata release. Corrected the location of the <code>HotPluggable</code> property.

Schema name	Version	Description
ProcessorMetrics	1.0.2	Errata release. Clarified descriptions of several properties to explain the usage when the resource represents a summary of processors.
Task	1.x.x	Errata release. Fixed <code>EndTime</code> property to not allow for <code>null</code> .
UpdateService	1.x.x	Errata release. Clarified description of <code>ImageURI</code> parameter to reference RFC3986. Clarified descriptions of various properties to replace "firmware" with "software".
(various files)	various	Errata release. Fixed several password related properties to be <code>null</code> in all responses regardless of the operation. Removed <code>@odata.id</code> , <code>@odata.context</code> , and <code>@odata.etag</code> properties from registry resources.
(all files)	various	Errata release. Descriptions in all schemas were updated for consistency in language and terminology. Any functional changes made that are not listed in this change log are unintentional and will be treated as errata.

### 3.15 Release 2019.1 (April 2019)

Schema name	Version	Description
AccountService	1.5.0	Added <code>AccountLockoutResetAfterEnabled</code> property. Deprecated <code>AccountProviderType</code> property in <code>LDAP</code> and <code>ActiveDirectory</code> .
Certificate	1.1.0	Added <code>Renew</code> and <code>Rekey</code> actions.
ComputerSystem	1.7.0	Added <code>Certificates</code> property to <code>Boot</code> . Added <code>Metrics</code> property to <code>ProcessorySummary</code> .
Drive	1.6.0	Added <code>PCIeFunctions</code> property to <code>Links</code> .
EthernetInterface	1.5.0	Added <code>FallbackAddress</code> property to <code>DHCPv4</code> .
Event	1.4.0	Added <code>Other</code> to <code>EventType</code> enum.
EventDestination	1.5.0	Deprecated <code>EventTypes</code> property and made it not required.
EventService	1.3.0	Added <code>EventGroupId</code> parameter to <code>SubmitTestEvent</code> . Deprecated <code>EventTypesForSubscription</code> property. Deprecated <code>EventType</code> property in <code>SSEFilterPropertiesSupported</code> . Deprecated <code>EventType</code> parameter in <code>SubmitTestEvent</code> .
ManagerAccount	1.3.0	Added <code>PasswordChangeRequired</code> property.
MessageRegistry	1.3.0	Added <code>LongDescription</code> , <code>ArgDescriptions</code> , and <code>ArgLongDescriptions</code> properties to <code>Messages</code> .
MetricReportDefinition	1.2.0	Added <code>MetricReportDefinitionEnabled</code> , <code>SuppressRepeatedMetricValue</code> , and <code>MetricReportHeartbeatInterval</code> properties. Added <code>Triggers</code> to <code>Links</code> .
PCIeSlots	1.1.0	Added <code>HotPluggable</code> property.

Schema name	Version	Description
PhysicalContext	N/A	Added <code>PowerSubsystem</code> and <code>Rectifier</code> physical context types.
Processor	1.5.0	Added <code>TotalEnabledCores</code> property.
Session	1.2.0	Added <code>SessionType</code> and <code>OemSessionType</code> properties.
Storage	1.7.0	Added <code>Ports</code> , <code>ControllerRates</code> , and <code>PCIeFunctions</code> to <code>StorageControllers</code> .
Triggers	1.1.0	Added <code>EventTriggers</code> property. Added <code>MetricReportDefinitions</code> to <code>Links</code> . Added <code>RedfishMetricReport</code> to <code>TriggerActionEnum</code> .
UpdateService	1.5.0	Added <code>MaxImageSizeBytes</code> property.
Zone	1.3.0	Added <code>ExternalAccessibility</code> property.
AccountService	1.x.x	Errata release. Clarified descriptions within <code>LDAPSearchSettings</code> .
Endpoint	1.x.x	Errata release. Clarified the descriptions for <code>EntityRole</code> .
EthernetInterface	1.4.2	Errata release. Corrected <code>StaticNameServers</code> to allow for null values.
Event	1.x.x	Errata release. Removed <code>@odata.id</code> and <code>@odata.etag</code> properties from JSON Schema.
EventDestination	1.x.x	Errata release. Modified rules around usage of <code>HttpHeaders</code> in a GET response to allow for an empty array. Clarified the descriptions for <code>EventTypes</code> and <code>ResourceTypes</code> .
ExternalAccountProvider	1.x.x	Errata release. Clarified descriptions within <code>LDAPSearchSettings</code> .
Message	1.0.7	Errata release. Clarified the description for <code>MessageArgs</code> .
Port	1.x.x	Errata release. Clarified the descriptions for <code>PortId</code> , <code>AssociatedEndpoints</code> , and <code>ConnectedSwitches</code> . Clarified the description of the overall resource.
Resource	1.x.x	Errata release. Corrected regex pattern for properties inside of <code>Oem</code> to match requirements in the specification. Clarified the description for <code>MemberId</code> .
Sensor	1.0.1	Errata release. Corrected the descriptions and units definition for energy reading types of <code>kWh</code> and corrected UCUM unit definition to <code>kW.h</code> .
UpdateService	1.x.x	Errata release. Clarified <code>HttpPushUri</code> description to include a recommendation of using HTTP status 411 when the request does not include the <code>Content-Length</code> header.
(various files)	various	Errata release. Regenerating JSON Schema to use <code>uri-reference</code> instead of <code>uri</code> as the format for properties that represent URIs. Fixed many properties that allowed for <code>null</code> , but were not intended for it.

### 3.16 Release 2018.3 (December 2018)

Schema name	Version	Description
AccelerationFunction	1.0.0	Initial release. A resource to describe an acceleration function within a Redfish implementation.
AccelerationFunctionCollection	1.0.0	Initial release. A collection of acceleration functions.
AccountService	1.4.0	Added <code>Certificates</code> property to <code>LDAP</code> and <code>ActiveDirectory</code> objects.
AttributeRegistry	1.3.0	Added <code>Oem</code> property to <code>Attributes</code> and <code>Menus</code> . Added <code>Hidden</code> property to <code>Menus</code> .
Certificate	1.0.0	Initial release. A resource to describe a certificate within a Redfish implementation.
CertificateCollection	1.0.0	Initial release. A collection of certificates.
CertificateLocations	1.0.0	Initial release. A resource to describe certificate locations within a Redfish implementation.
CertificateService	1.0.0	Initial release. A resource to describe a certificate service within a Redfish implementation.
Chassis	1.9.0	Added <code>Sensors</code> and <code>EnvironmentalClass</code> properties.
ComputerSystem	1.6.0	Added <code>AliasBootOrder</code> , <code>BootOrderPropertySelection</code> , and <code>PowerRestorePolicy</code> properties. Added <code>AddResourceBlock</code> and <code>RemoveResourceBlock</code> actions.
Endpoint	1.3.0	Added <code>AccelerationFunction</code> to the <code>EntityType</code> enum.
ExternalAccountProvider	1.1.0	Added <code>Certificates</code> property.
ManagerAccount	1.2.0	Added <code>Certificates</code> property.
ManagerNetworkProtocol	1.4.0	Added <code>Certificates</code> property to <code>HTTPS</code> object.
Memory	1.7.0	Added <code>Intel3DXPoint</code> to the <code>MemoryMedia</code> enum. Added <code>HBM</code> and <code>HBM2</code> to the <code>MemoryDeviceType</code> enum. Added <code>Die</code> to the <code>BaseModuleType</code> enum. Deprecated <code>Unlocked</code> and <code>Frozen</code> enums in <code>SecurityStates</code> , as well as the <code>SecurityStates</code> property in favor of the new <code>SecurityState</code> , <code>ConfigurationLocked</code> , <code>ConfigurationLockCapable</code> , <code>DataLockCapable</code> , and <code>PassphraseLockLimit</code> properties.
MetricReport	1.1.0	Added <code>Timestamp</code> property for the overall <code>MetricReport</code> .
MetricReportDefinition	1.1.0	Deprecated <code>Keys</code> property within <code>Wildcards</code> in favor of <code>Values</code> property to align with other schemas.
PhysicalContext	N/A	Added <code>CPUSubsystem</code> , <code>GPUSubsystem</code> , <code>FPGA</code> , <code>Accelerator</code> , <code>MemorySubsystem</code> , <code>CoolingSubsystem</code> , <code>Motor</code> , <code>Transformer</code> , <code>ACUtilityInput</code> , <code>ACStaticBypassInput</code> , <code>ACMaintenanceBypassInput</code> , <code>DCBus</code> , <code>ACOutput</code> , and <code>ACInput</code> physical context types. Updated <code>Intake</code> and <code>Exhaust</code> descriptions to allow for calculated values over a region. Added <code>PhysicalSubContext</code> definition.



Schema name	Version	Description
Processor	1.4.0	Added <code>TDPWatts</code> , <code>MaxTDPWatts</code> , <code>AccelerationFunctions</code> , and <code>Metrics</code> properties. Added various other properties to support reporting and management of FPGAs. Added <code>Power</code> to <code>ProcessorArchitecture</code> . Added <code>PowerISA</code> to <code>InstructionSet</code> .
ProcessorMetrics	1.0.0	Initial release. A resource to describe processor metrics within a Redfish implementation.
ResourceBlock	1.3.0	Added <code>ResourceBlockLimits</code> term. Added <code>Drives</code> property.
Sensor	1.0.0	Initial release. A resource to describe a sensor within a Redfish implementation.
SensorCollection	1.0.0	Initial release. A collection of sensor resources.
ServiceRoot	1.5.0	Added <code>Vendor</code> , <code>ResourceBlocks</code> , and <code>CertificateService</code> properties.
Storage	1.6.0	Added <code>SupportedRAIDTypes</code> to <code>StorageControllers</code> .
Task	1.4.0	Added <code>PercentComplete</code> property.
TelemetryService	1.1.0	Deprecated <code>MetricReportValues</code> parameter in <code>SubmitTestMetricReport</code> action in favor of the <code>GeneratedMetricReportValues</code> parameter in order to match the <code>MetricValues</code> definition of a <code>MetricReport</code> .
UpdateService	1.4.0	Added <code>Username</code> and <code>Password</code> parameters to <code>SimpleUpdate</code> . Added <code>HttpPushUriOptions</code> and <code>HttpPushUriOptionsBusy</code> properties.
VirtualMedia	1.3.0	Added <code>UserName</code> , <code>Password</code> , <code>TransferProtocolType</code> , and <code>TransferMethod</code> properties. Added <code>UserName</code> , <code>Password</code> , <code>TransferProtocolType</code> , and <code>TransferMethod</code> parameters to <code>InsertMedia</code> action.
AttributeRegistry	1.x.x	Errata release. Clarified the description for <code>ValueName</code> . Add missing required terms for <code>AttributeName</code> and <code>ValueName</code> .
Bios	1.0.5	Errata release. Clarified the description for <code>Attributes</code> .
Drive	1.x.x	Errata release. Modified references to <code>Volume</code> to point to the Swordfish definition.
Job	1.0.1	Errata release. Added missing units annotation on <code>PercentComplete</code> .
JsonSchemaFile	1.x.x	Errata release. Removed strict normative wording about the format of the schema file name in favor of pointing to the specification for the acceptable format.
MetricDefinition	1.0.1	Errata release. Updated descriptions for <code>Wildcards</code> to match other schemas.
MetricReport	1.0.1	Errata release. Clarified <code>Timestamp</code> property description within a <code>MetricValue</code> .
MetricReportDefinition	1.0.1	Errata release. Updated descriptions for <code>Wildcards</code> to match other schemas.
Power	1.x.x	Errata release. Clarified the description for <code>PowerMetrics</code> .
Redundancy	1.x.x	Errata release. Removed <code>Required</code> term on <code>MaxNumSupported</code> .
ServiceRoot	1.x.x	Errata release. Allow <code>Product</code> property to be null.

Schema name	Version	Description
Storage	1.x.x	Errata release. Modified references to Volume to point to the Swordfish definition.
Triggers	1.0.1	Errata release. Updated descriptions for <code>wildcards</code> to match other schemas. Fixed description for the <code>RedfishEvent</code> enum.
UpdateService	1.x.x	Errata release. Clarified <code>HttpPushUri</code> to indicate a client requires the same privileges as if performing operations on the UpdateService.
(various files)	various	Errata release. Added <code>Revisions</code> and <code>Release</code> annotation to various schema elements as needed.

### 3.17 Release 2018.2 (August 2018)

Schema name	Version	Description
Job	1.0.0	Initial release. A resource to describe a job within a Redfish implementation.
JobCollection	1.0.0	Initial release. A collection of jobs.
JobService	1.0.0	Initial release. Entry point for managing jobs within a Redfish implementation.
MetricDefinition	1.0.0	Initial release. Metadata that defines a metric (measurement point).
MetricDefinitionCollection	1.0.0	Initial release. A collection of metric definitions.
MetricReport	1.0.0	Initial release. A set of reported metric values.
MetricReportCollection	1.0.0	Initial release. A collection of metric reports.
MetricReportDefinition	1.0.0	Initial release. Metadata that defines how metric reports are constructed.
MetricReportDefinitionCollection	1.0.0	Initial release. A collection of metric report definitions.
PCleSlots	1.0.0	Initial release. Contains details on PCIe slots.
TelemetryService	1.0.0	Initial release. Entry point for managing a Redfish telemetry service.
Triggers	1.0.0	Initial release. Specifies triggers which apply to metrics.
TriggersCollection	1.0.0	Initial release. A collection of triggers.
ActionInfo	1.1.0	Added <code>MinimumValue</code> and <code>MaximumValue</code> properties.
Assembly	1.2.0	Added <code>SerialNumber</code> and <code>PhysicalContext</code> properties.
Chassis	1.8.0	Added <code>PCleSlots</code> link.
CollectionCapabilities	1.1.0	Added <code>ComputerSystemConstrainedComposition</code> enum.

Schema name	Version	Description
CompositionService	1.1.0	Added <code>AllowOverprovisioning</code> and <code>AllowZoneAffinity</code> properties.
Drive	1.5.0	Added <code>HotspareReplacementMode</code> property.
Endpoint	1.2.0	Deprecated <code>PciFunctionNumber</code> and <code>PciClassCode</code> inside <code>ConnectedEntity</code> in favor of <code>FunctionNumber</code> and <code>ClassCode</code> inside of <code>PciId</code> .
Event	1.3.0	Deprecated <code>EventType</code> in favor of new subscription properties. Added <code>MetricReport</code> as an <code>EventType</code> . Added <code>EventGroupId</code> to <code>EventRecord</code> .
EventDestination	1.4.0	Added <code>RegistryPrefixes</code> , <code>ResourceTypes</code> , <code>SubordinateResources</code> , and <code>EventFormatType</code> properties.
EventService	1.2.0	Added <code>RegistryPrefixes</code> , <code>ResourceTypes</code> , <code>SubordinateResourcesSupported</code> , and <code>EventFormatTypes</code> properties. Added <code>SSEFilterPropertiesSupported</code> object.
HostInterface	1.2.0	Added <code>AuthNoneRoleId</code> and <code>AuthNoneRole</code> properties.
LogEntry	1.4.0	Deprecated <code>EventType</code> . Added <code>EventGroupId</code> property.
Manager	1.5.0	Added <code>RemoteRedfishServiceUri</code> and <code>RemoteAccountService</code> properties.
ManagerNetworkProtocol	1.3.0	Added <code>DHCPv6</code> , <code>RDP</code> , and <code>RFB</code> properties.
Memory	1.6.0	Added <code>OverwriteUnit</code> action. Added <code>IntelOptane</code> to the <code>MemoryType</code> enum.
MessageRegistry	1.2.0	Added <code>ClearingLogic</code> property.
NetworkAdapter	1.2.0	Added <code>NPAR</code> property to control NIC Partitioning. Added <code>PCIEInterface</code> object.
NetworkDeviceFunction	1.3.0	Added <code>VLAN</code> and <code>VLANs</code> properties to the <code>Ethernet</code> object. Added <code>FibreChannelId</code> to <code>FibreChannel</code> object. Deprecated <code>PhysicalPortAssignment</code> at the root of the payload in favor of <code>PhysicalPortAssignment</code> inside <code>Links</code> .
NetworkPort	1.2.0	Added properties to support Fibre Channel devices. Deprecated <code>LinkSpeedMbps</code> in favor of <code>CapableLinkSpeedMbps</code> .
PCIeDevice	1.3.0	Added <code>PCIEInterface</code> object and definition for referencing from other schema.
Protocol	N/A	Added <code>I2C</code> protocol type.
Resource	1.7.0	Deprecated the <code>Location</code> string in <code>PostalAddress</code> in favor of <code>AdditionalInfo</code> . Added <code>AdditionalInfo</code> in <code>Placement</code> . Added <code>Contacts</code> array in <code>Location</code> .
ResourceBlock	1.2.0	Added <code>Expansion</code> to the <code>ResourceBlockType</code> enum. Added <code>Unavailable</code> to the <code>CompositionState</code> enum.
Schedule	1.2.0	Initial transition from SNIA. Added <code>Every</code> enumeration to <code>DayOfWeek</code> and <code>MonthOfYear</code> . Updated several properties to use <code>Duration</code> and <code>DateTimeOffset</code> types.

Schema name	Version	Description
ServiceRoot	1.4.0	Added <code>ExcerptQuery</code> and <code>OnlyMemberQuery</code> to <code>ProtocolFeaturesSupported</code> . Added <code>JobService</code> and <code>TelemetryService</code> properties.
Storage	1.5.0	Added <code>CacheSummary</code> and <code>PCIeInterface</code> objects to <code>StorageController</code> .
Task	1.3.0	Added <code>Payload</code> and <code>HidePayload</code> properties.
Thermal	1.5.0	Added <code>SensorNumber</code> to <code>Fan</code> .
UpdateService	1.3.0	Deprecated <code>NSF</code> <code>TransferProtocolType</code> in favor of <code>NFS</code> .
Assembly	1.x.x	Errata release. Added clause about using <code>00:00:00Z</code> in the <code>ProductionDate</code> property as the time of day value if it's unknown.
AttributeRegistry	1.x.x	Errata release. Fixed typo in the description for <code>GrayOut</code> . Relaxed patterns allowed for <code>ValueName</code> , <code>MenuName</code> , and <code>MenuPath</code> properties.
Bios	1.x.x	Errata release. Clarified behavior around the <code>ResetBios</code> action.
BootOption	1.x.x	Errata release. Clarified the description of the <code>Alias</code> property.
ComputerSystem	1.x.x	Errata release. Added missing units annotation to <code>TotalSystemMemoryGiB</code> . Corrected descriptions for the <code>Boot</code> properties since the scope of <code>Boot</code> has grown over time.
Drive	1.x.x	Errata release. Added missing units annotation to <code>PredictedMediaLifeLeftPercent</code> and <code>PercentageComplete</code> .
EthernetInterface	1.4.1	Errata release. Fixed type definition of <code>IPv6StaticDefaultGateways</code> to not require <code>PrefixLength</code> .
EventService	1.x.x	Errata release. Added clarification to <code>OriginOfCondition</code> parameter for <code>SubmitTestEvent</code> to highlight that it's a string and not a reference object.
IPAddresses	1.0.7	Errata release. Fixed type definition of <code>IPv6GatewayStaticAddress</code> to not require <code>PrefixLength</code> .
LogEntry	1.x.x	Errata release. Fixed typo in the description for <code>EntryType</code> . Clarified description and long description in several properties.
ManagerNetworkProtocol	1.x.x	Errata release. Clarified description of <code>DHCP</code> to show it's for DHCPv4.
Memory	1.x.x	Errata release. Added missing units annotation to many properties in the schema. Added references to NIST standards for what each type of erase action follows.
MemoryChunks	1.x.x	Errata release. Added missing units annotation to <code>MemoryChunkSizeMiB</code> , <code>OffsetMiB</code> , and <code>SizeMiB</code> .
MemoryMetrics	1.x.x	Errata release. Added missing units annotation to <code>HealthData</code> and <code>PredictedMediaLifeLeftPercent</code> .

Schema name	Version	Description
MessageRegistryFile	1.x.x	Errata release. Clarified <code>Registry</code> property to show that this is used for other types of registries.
NetworkPort	1.x.x	Errata release. Added missing units annotation to <code>LinkSpeedMbps</code> , <code>MinBWAllocPercent</code> , and <code>MaxBWAllocPercent</code> .
PrivilegeRegistry	1.x.x	Errata release. Fixed permissions term on <code>PrivilegesUsed</code> , <code>OEMPrivilegesUsed</code> , <code>Entity</code> , <code>Targets</code> , and <code>Privilege</code> .
Processor	1.x.x	Errata release. Added missing units annotation to <code>MaxSpeedMHz</code> .
Protocol	N/A	Errata release. Removed <code>Vendor Proprietary</code> wording from PCIe description.
Resource	1.x.x	Errata release. Added missing required term on <code>Name</code> in <code>ResourceCollection</code> . Fixed the description for the <code>PartLocation</code> property inside of <code>Location</code> .
Resource	1.6.1	Errata release. Fixed permissions of <code>Longitude</code> , <code>Latitude</code> , and <code>AltitudeMeters</code> properties.
SessionService	1.x.x	Errata release. Clarified the long description of <code>ServiceEnabled</code> .
SoftwareInventory	1.x.x	Errata release. Added clause about using <code>00:00:00Z</code> in the <code>ReleaseDate</code> property as the time of day value if it's unknown.
Storage	1.x.x	Errata release. Clarified the description for <code>SpeedGbps</code> .
UpdateService	1.x.x	Errata release. Clarified the long descriptions for <code>Targets</code> , <code>HttpPushUriTargets</code> , and <code>HttpPushUriTargetsBusy</code> .
(all files)	various	Errata release. Added missing required annotation on <code>Members</code> properties in resource collections. Added missing <code>Members@odata.nextLink</code> property to resource collections. Corrected some cases in JSON Schema where the type <code>integer</code> should have been used instead of <code>number</code> . Added <code>@odata.id</code> , <code>@odata.type</code> , and <code>@odata.context</code> as required properties in JSON Schema. Added description and long description terms to all schema elements where missing. Added <code>Capabilities</code> and <code>Uris</code> annotations on all resources.

### 3.18 Release 2018.1 (April 2018)

Schema name	Version	Description
ExternalAccountProvider	1.0.0	Initial release. Contains additional external account provider information for managers.
ExternalAccountProviderCollection	1.0.0	Initial release. Collection of external account providers.
AccountService	1.3.0	Added support for LDAP and Active Directory external account providers. Added <code>ExternalAccountProviders</code> collection to support additional providers or multiple LDAP/AD instances.

Schema name	Version	Description
Assembly	1.1.0	Added <code>Status</code> to <code>AssemblyData</code> .
AttributeRegistry	1.2.0	Added <code>ResetRequired</code> , <code>UefiDevicePath</code> , <code>UefiKeywordName</code> , and <code>UefiNamespaceId</code> attributes.
Chassis	1.7.0	Added <code>UUID</code> property and <code>Switches</code> links.
Drive	1.4.0	Deprecated <code>Location</code> array in favor of singular <code>PhysicalLocation</code> property.
EventDestination	1.3.0	Added <code>SubscriptionType</code> to allow for SSE support.
EventService	1.1.0	Added <code>ServerSentEventUri</code> to support Server-Sent Eventing (SSE).
Manager	1.4.0	Added <code>AutoDSTEnabled</code> property and <code>Switches</code> links.
Memory	1.5.0	Deprecated poorly-named <code>PassphraseState</code> in <code>Regions</code> object and added <code>PassphraseEnabled</code> to replace it.
PCIeFunction	1.2.0	Added <code>NetworkDeviceFunctions</code> links.
Processor	1.3.0	Added <code>SubProcessors</code> collection; added <code>Core</code> and <code>Thread</code> processor types.
Protocol	N/A	Added <code>OEM</code> protocol type.
ResourceBlock	1.1.0	Added properties to support sharing capabilities.
Settings	1.2.0	Added <code>OperationApplyTimeSupport</code> and <code>MaintenanceWindow</code> objects to provide more deterministic behavior for the application of Settings-based data.
SoftwareInventory	1.2.0	Added <code>Manufacturer</code> and <code>ReleaseDate</code> properties.
Task	1.2.0	Added <code>TaskMonitor</code> property.
AttributeRegistry	1.x.x	Errata release. Fixed regex patterns for various properties.
EventService	1.0.7	Errata release. Fixed permissions on <code>DeliveryRetryAttempts</code> and <code>DeliveryRetryIntervalSeconds</code> properties.
HostInterface	1.x.x	Errata release. Description clarifications.
ManagerAccount	1.x.x	Errata release. Clarified the <code>RoleId</code> property description by stating its relation to <code>RoleId</code> in the Role resource.
MemoryChunks	1.2.1	Errata release. Description clarifications.
Memory	1.4.1	Errata release. Description clarifications.
UpdateService	1.x.x	Errata release. Regenerated JSON schema to pick up action parameters added in previous release.

### 3.19 Release 2017.3 (November 2017)

Schema name	Version	Description
Assembly	1.0.0	Initial release. Contains manufacturing and assembly information for a piece of equipment.
BootOption	1.0.0	Initial release. Contains information about a boot option contained within a system.
BootOptionCollection	1.0.0	Initial release. A collection of boot options.
Protocol	1.0.0	Initial release. Supporting schema file to hold definition of the common <code>Protocol</code> property.
Chassis	1.6.0	Added link to <code>Assembly</code> resource. Added <code>StorageEnclosure</code> to <code>ChassisType</code> .
ComputerSystem	1.5.0	Added support for managing the boot order (Boot Options). Added <code>SubModel</code> to describe product model variations. Added action for <code>SetDefaultBootOrder</code> . Added <code>LogicalProcessorCount</code> to <code>ProcessorSummary</code> . Added links for <code>ConsumingComputerSystems</code> and <code>SupplyingComputerSystems</code> .
Drive	1.3.0	Added link to <code>Assembly</code> resource.
Endpoint	1.1.0	Added <code>IPTransportDetails</code> object.
EthernetInterface	1.4.0	Added multiple objects to allow for full configuration of DHCPv4 and DHCPv6. Added <code>IPv4StaticAddresses</code> to provide mechanism for specifying static IP addresses regardless of DHCP settings. Added <code>StaticNameServers</code> and <code>StatelessAddressAutoConfig</code> objects to support their configuration.
LogEntry	1.3.0	Added <code>OemLogEntryCode</code> and <code>OemSensorType</code> properties to allow for legacy IPMI OEM definitions.
LogService	1.1.0	Added <code>LogEntryType</code> to describe the content type of a log.
Memory	1.4.0	Added <code>VolatileSizeMiB</code> , <code>NonVolatileSizeMiB</code> , <code>CacheSizeMiB</code> , <code>LogicalSizeMiB</code> properties. Added <code>Location</code> object.
MemoryChunks	1.2.0	Added <code>Status</code> object.
NetworkAdapter	1.1.0	Added <code>Assembly</code> link. Added <code>Location</code> object to <code>Controllers</code> object.
NetworkDeviceFunction	1.2.0	Added <code>Endpoints</code> to <code>Links</code> object.
PCleDevice	1.2.0	Added <code>Assembly</code> link.
PhysicalContext	1.3.0	Added additional enumerations for <code>PhysicalContext</code> .
Port	1.1.0	Added <code>Location</code> object.
Power	1.5.0	Added <code>PowerInputWatts</code> , <code>PowerOutputWatts</code> , and <code>EfficiencyPercent</code> properties, <code>Location</code> object, and <code>Assembly</code> link to <code>PowerSupply</code> object.
Processor	1.2.0	Added <code>Assembly</code> link.

Schema name	Version	Description
Redundancy	1.3.0	Added <code>NotRedundant</code> enumeration to <code>Mode</code> . Changed <code>Mode</code> to be writable. Removed duplicate description text that appears in the enumeration definitions.
Resource	1.6.0	Added <code>Latitude</code> , <code>Longitude</code> and <code>AltitudeMeters</code> to <code>Location</code> object. Added <code>NQN</code> and <code>NSID</code> to <code>DurableNameFormat</code> .
ServiceRoot	1.3.0	Added <code>Product</code> property for general product identification. Added <code>ProtocolFeaturesSupported</code> object to allow for discovery of supported optional Redfish protocol features.
Storage	1.4.0	Added <code>Assembly</code> link.
Switch	1.1.0	Added <code>Location</code> object.
Thermal	1.4.0	Added <code>Assembly</code> links to <code>Fan</code> objects. Added <code>DeltaReadingCelsius</code> , <code>DeltaPhysicalContext</code> , <code>MaxAllowableOperatingValue</code> , <code>MinAllowableOperatingValue</code> , <code>AdjustedMaxAllowableOperatingValue</code> , and <code>AdjustedMinAllowableOperatingValue</code> to <code>Temperatures</code> object.
VirtualMedia	1.2.0	Added <code>InsertMedia</code> and <code>EjectMedia</code> actions to provide standardized means for using virtual media features. Changed <code>Image</code> , <code>Inserted</code> , and <code>WriteProtected</code> to be writable.
Zone	1.2.0	Added <code>Identifiers</code> property.
Bios	1.0.3	Errata release. Corrected parameter descriptions in actions.
Chassis	1.x.x	Errata release. Corrected parameter descriptions in actions.
ComputerSystem	1.x.x	Errata release. Corrected parameter descriptions in actions. Added descriptions for <code>SystemType</code> enumerations.
Drive	1.x.x	Errata release. Migrated definition of <code>Operations</code> object to the <code>Drive</code> schema. Corrected parameter descriptions in actions.
Endpoint	1.0.3	Errata release. Added schema annotations to prevent additional property definitions in <code>ConnectedEntity</code> and <code>PciId</code> definitions.
EthernetInterface	1.x.x	Errata release. Changed internal schema references to <code>IPAddresses</code> and <code>VlanNetworkInterface</code> to use abstract base types.
Event	1.x.x	Errata release. Changed internal schema location for <code>EventType</code> definitions.
EventDestination	1.x.x	Errata release. Changed internal schema location for <code>EventType</code> definitions.
EventService	1.0.6	Errata release. Corrected parameter descriptions in actions.
Fabric	1.0.3	Errata release. Changed internal schema location for <code>FabricType</code> definitions.
IPAddresses	1.0.6	Errata release. Changed internal schema references for <code>IPAddresses</code> and <code>VlanNetworkInterface</code> to use abstract base types. Corrected <code>PrefixLength</code> in <code>IPv6StaticAddresses</code> to be a read-write property.



Schema name	Version	Description
LogEntry	1.2.1	Errata release. Changed internal schema location for <code>EventType</code> definitions. Added descriptions to all enumerations.
LogService	1.0.5	Errata release. Corrected parameter descriptions in actions.
Manager	1.x.x	Errata release. Corrected parameter descriptions in actions.
Memory	1.x.x	Errata release. Corrected description of <code>OperatingSpeedMHz</code> to reflect changes in memory device reporting (value may be in MHz or MT/s, but will match published specifications in either case). Corrected parameters in actions to show they are mandatory.
MemoryMetrics	1.x.x	Errata release. Corrected description of <code>AlarmTrips</code> regarding behavior upon system reset.
NetworkDeviceFunction	1.x.x	Errata release. Clarified descriptions <code>InitiatorName</code> , <code>PrimaryTargetName</code> , and <code>SecondaryTargetName</code> properties in the <code>iSCSIBoot</code> object.
PCleFunction	1.x.x	Errata release. Changed internal schema references to <code>StorageController</code> to use abstract base types.
PhysicalContext	1.x.x	Errata release. Changed internal schema location for <code>PhysicalContext</code> definition.
Port	1.0.3	Errata release. Changed internal schema location for <code>PortProtocol</code> definitions. Corrected parameter descriptions in actions.
Power	1.x.x	Errata release. Changed internal schema references to <code>PhysicalContext</code> and <code>IndicatorLED</code> definitions.
PrivilegeRegistry	1.x.x	Errata release. Changed internal schema references to <code>PrivilegeType</code> definitions.
Privileges	1.x.x	Errata release. Changed internal schema location for <code>PrivilegeType</code> .
Resource	1.x.x	Errata release. Changed internal schema location for numerous definitions.
Role	1.x.x	Errata release. Changed internal schema references to <code>PrivilegeType</code> definitions.
SecureBoot	1.0.3	Errata release. Corrected parameters in actions to show they are mandatory.
Storage	1.x.x	Errata release. Corrected parameters in actions to show they are mandatory. Changed internal schema references to <code>Identifier</code> and <code>Protocol</code> definitions.
Switch	1.0.3	Errata release. Changed internal schema references to <code>IndicatorLED</code> , <code>PowerState</code> , and <code>Protocol</code> definitions. Corrected descriptions of actions.
TaskService	1.x.x	Errata release. Updated description of <code>LifeCycleEventOnTaskStateChange</code> to remove obsolete terminology.
VlanNetworkInterface	1.x.x	Errata release. Changed internal schema definition for <code>VLAN</code> .

### 3.20 Release 2017.2 (August 2017)

Schema name	Version	Description
Memory	1.3.0	Deprecated <code>FunctionClasses</code> . Added memory module-centric identification properties <code>ModuleManufacturerID</code> , <code>ModuleProductID</code> , <code>MemorySubsystemControllerManufacturerID</code> , and <code>MemorySubsystemControllerProductID</code> . Deprecated the PCIe-centric identification properties <code>VendorID</code> , <code>DeviceID</code> , <code>SubsystemVendorID</code> , and <code>SubsystemDeviceID</code> .
PhysicalContext	1.2.0	Added <code>Chassis</code> and <code>Fan</code> as enumerations to <code>PhysicalContext</code> .
Power	1.4.0	Added <code>PhysicalContext</code> to the <code>PowerControl</code> object.
Resource	1.5.0	Added several objects and properties to <code>Location</code> to enable reporting of physical locations at the building, room and intra-chassis levels. Deprecated <code>Info</code> and <code>InfoFormat</code> in favor of the new, structured <code>Location</code> properties.
Role	1.2.0	Added <code>RoleId</code> property to enable references from <code>ManagerAccount</code> resources.
Settings	1.1.0	Added <code>SupportedApplyTimes</code> to allow control over the application of <code>Settings</code> to a resource. This includes support for specifying maintenance windows.
Storage	1.3.0	Added common <code>Name</code> property to <code>StorageController</code> object.
AccountService	1.x.x	Errata release. Added clarifications to <code>ServiceEnabled</code> usage.
Chassis	1.x.x	Errata release. Added clarifications to <code>IndicatorLED</code> usage.
ComputerSystem	1.x.x	Errata release. Added clarifications to <code>IndicatorLED</code> usage.
EventDestination	1.x.x	Errata release. Added clarifications to <code>OriginResources</code> and <code>MessageId</code> usage.
EventService	1.x.x	Errata release. Added clarifications to <code>DeliveryRetryAttempts</code> usage.
Manager	1.x.x	Errata release. Corrected enumeration descriptions for <code>CommandShell</code> .
ManagerAccount	1.x.x	Errata release. Added clarifications to <code>RoleId</code> usage.
Power	1.x.x	Errata release. Removed the errant auto-expand annotation within <code>Redundancy</code> .
Resource	1.x.x	Errata release. Added clarifications to <code>IndicatorLED</code> usage.
SerialInterface	1.x.x	Errata release. Removed errant periods in enumeration strings.
SessionService	1.x.x	Errata release. Added clarifications to <code>ServiceEnabled</code> usage.
Thermal	1.x.x	Errata release. Removed the errant auto-expand annotation within <code>Redundancy</code> .

### 3.21 Release 2017.1 (April 2017)

Schema name	Version	Description
CollectionCapabilities	1.0.0	Initial release. Describes the capabilities of a collection in terms of how a client is able to create new resources within the collection.
CompositionService	1.0.0	Initial release. Describes a composition service used to create systems from available resources or resource blocks. It includes the properties of the service as well as links to the actual resources available for composition.
ResourceBlock	1.0.0	Initial release. Represents a resource block, its components, and any affinity to a composed device.
ResourceBlockCollection	1.0.0	Initial release. A collection of resource blocks.
Chassis	1.5.0	Added array of links to <code>ResourceBlock</code> resources.
ComputerSystem	1.4.0	Added <code>TotalSystemPersistentMemoryGiB</code> to <code>MemorySummary</code> . Added array of links to <code>ResourceBlock</code> resources.
Drive	1.2.0	Added link to <code>Chassis</code> resource.
EthernetInterface	1.3.0	Added link to <code>Chassis</code> resource.
Memory	1.2.0	Added properties for describing and allocating memory regions.
PhysicalContext	1.1.0	Added <code>Memory</code> as an enumeration value.
Resource	1.4.0	Added <code>PowerCycle</code> as an enumeration value for <code>ResetType</code> . Modified descriptions of <code>ResetType</code> to remove system-centric text. Corrected the validation pattern for properties using the UUID format (only JSON Schema versions).
ServiceRoot	1.2.0	Added link to <code>CompositionService</code> resource.
Storage	1.2.0	Added <code>FCP</code> and <code>FICON</code> as enumeration values for <code>Protocol</code> .
UpdateService	1.2.0	Added <code>HttpPushUriTargets</code> and <code>HttpPushUriTargetsBusy</code> properties and <code>Targets</code> optional parameter (for <code>SimpleUpdate</code> ) to allow selection of a particular target device or devices.
Endpoint	1.0.2	Errata release. Corrected validation pattern on PCI ID-related properties. Removed unnecessary schema reference inclusions from CSDL schema.
EventDestination	1.x.x	Errata release. Marked <code>Context</code> property as required instead of required on create. Service is required to provide the <code>Context</code> (may be NULL), but clients are not required to specify a context when creating a new Event Destination.
PCleFunction	1.0.2	Errata release. Corrected validation pattern on PCI ID-related properties.
(many)	various	Minor release. Added <code>Actions</code> and <code>OemActions</code> objects to allow for OEM extensions.

Schema name	Version	Description
(many)	various	Errata release. Corrected integer type properties in CSDL schemas to Int64 (from Int16 or Int32) for consistency. Added missing descriptions in Complex Type definitions. Added <code>Actions</code> and <code>OemActions</code> objects to allow for OEM extensions. Corrected <code>Links</code> and <code>Members</code> properties (Collection schemas) in all schemas to be non-nullable.

### 3.22 Release 2016.3 (December 2016)

Schema name	Version	Description
HostInterface	1.0.0	Initial release. Contains properties for describing and configuring a Redfish host interface.
HostInterfaceCollection	1.0.0	Initial release. Collection of Redfish host interfaces.
NetworkAdapter	1.0.0	Initial release. Describes general-purpose network adapters.
NetworkAdapterCollection	1.0.0	Initial release. Collection of network adapters.
NetworkInterface	1.0.0	Initial release. Provides linkages between network adapters, network ports, and network device functions.
NetworkInterfaceCollection	1.0.0	Initial release. Collection of network interfaces.
NetworkDeviceFunction	1.0.0	Initial release. Describes a logical interface exposed by a network adapter.
NetworkDeviceFunctionCollection	1.0.0	Initial release. Collection of network device functions.
NetworkPort	1.0.0	Initial release. Describes a discrete physical port capable of connecting to a network.
NetworkPortCollection	1.0.0	Initial release. Collection of network ports.
PrivilegeRegistry	1.0.0	Initial release. Schema for definition of HTTP operation-to-privilege mapping.
AccountService	1.1.0	Added link to <code>PrivilegeRegistry</code> resource.
Chassis	1.4.0	Added <code>RackGroup</code> to <code>ChassisType</code> enumeration. Added link to <code>NetworkAdapterCollection</code> resource. Added <code>HeightMm</code> , <code>WidthMm</code> , <code>DepthMm</code> , and <code>WeightKg</code> properties. Added array of links to <code>PCIeDevice</code> resources.
ComputerSystem	1.3.0	Added link to <code>NetworkDeviceCollection</code> resource. Added <code>FirmwareVersion2</code> and <code>InterfaceTypeSelection</code> to <code>TrustedModules</code> object.
EthernetInterface	1.2.0	Added link to <code>HostInterface</code> resource to support Redfish Host Interface Specification.
Manager	1.3.0	Added link to <code>HostInterfaceCollection</code> resource.
ManagerNetworkProtocol	1.1.0	Added <code>DHCP</code> protocol object.
Memory	1.1.0	Added <code>Status</code> object.

Schema name	Version	Description
MemoryDomain	1.1.0	Added <code>AllowsMirroring</code> and <code>AllowsSparing</code> properties.
Resource	1.3.0	Added <code>PostalAddress</code> and <code>Placement</code> objects to <code>Location</code> , each containing numerous properties for detailed location information.
SoftwareInventory	1.1.0	Added <code>SoftwareId</code> , <code>LowestSupportedVersion</code> , <code>UefiDevicePaths</code> and <code>RelatedItem</code> properties.
Thermal	1.2.0	Added <code>Manufacture</code> , <code>Model</code> , <code>SerialNumber</code> , <code>PartNumber</code> , <code>SparePartNumber</code> and <code>IndicatorLED</code> to <code>Fan</code> object.
UpdateService	1.1.0	Added <code>HttpPushUri</code> property.
(all files)	various	Errata release. Added explicit permissions annotations to all properties to clearly show which properties are read-write vs. read-only. Corrected Permission annotation with invalid enumeration references. Removed permissions annotation from embedded objects (permissions now on every property). Removed permission annotations from CSDL Type definitions to avoid conflicts with property definitions. Corrected all property descriptions to always end with a period.
ComputerSystem	1.0.4	Errata release. Corrected CSDL Type of <code>TotalSystemMemoryGiB</code> from <code>Edm.Int64</code> to <code>Decimal</code> .
ComputerSystem	1.1.2	Errata release. Corrected CSDL Type of <code>TotalSystemMemoryGiB</code> from <code>Edm.Int64</code> to <code>Decimal</code> .
ComputerSystem	1.2.1	Errata release. Corrected CSDL Type of <code>TotalSystemMemoryGiB</code> from <code>Edm.Int64</code> to <code>Decimal</code> .
Port	1.0.1	Corrected CSDL Type of <code>CurrentSpeedGbps</code> and <code>MaxSpeedGbps</code> from <code>Edm.Int64</code> to <code>Decimal</code> .
Power	1.2.1	Corrected descriptions for voltage-related properties and changed sensor descriptions to avoid use of term "current", instead referring to "present value".
Power	1.1.1	Corrected descriptions for voltage-related properties and changed sensor descriptions to avoid use of term "current", instead referring to "present value".
Power	1.0.3	Corrected descriptions for voltage-related properties and changed sensor descriptions to avoid use of term "current", instead referring to "present value".
ServiceRoot	1.1.1	Added missing EntityContainer for <code>ServiceContainer</code> in CSDL schema.

### 3.23 Release 2016.2 (August 2016)

Schema name	Version	Description
(all files)	various	Corrected Reference URI links to OData v4 (errata 3) and added Capabilities annotations to CSDL files.
ActionInfo	1.0.0	Initial release. Action info describes the parameters and other information necessary to perform a Redfish action to a particular action target.
Endpoint	1.0.0	Initial release. An endpoint is an entity that sends or receives protocol defined messages over a transport.
EndpointCollection	1.0.0	Initial release. Collection of endpoints.
Fabric	1.0.0	Initial release. A fabric consists of one or more switches and may include endpoints and zones.
FabricCollection	1.0.0	Initial release. Collection of fabric resources.
MemoryChunks	1.0.0	Initial release. Describes a memory chunk and memory interleave sets.
MemoryChunksCollection	1.0.0	Initial release. Collection of memory chunks.
MemoryDomain	1.0.0	Initial release. Memory domains are used to indicate to the client which memory (DIMMs) can be grouped together in memory chunks to form interleave sets or otherwise grouped together.
MemoryDomainCollection	1.0.0	Initial release. Collection of memory domains.
PCleDevice	1.0.0	Initial release. Describes a PCIe device attached to a system.
PCleFunction	1.0.0	Initial release. Describes a PCIe function.
Port	1.0.0	Initial release. Describes a port of a switch.
PortCollection	1.0.0	Initial release. Collection of ports.
SoftwareInventory	1.0.0	Initial release. Describes an inventory of software components.
SoftwareInventoryCollection	1.0.0	Initial release. Collection of software components.
Switch	1.0.0	Initial release. Describes a simple fabric switch.
SwitchCollection	1.0.0	Initial release. Collection of switches.
UpdateService	1.0.0	Initial release. Describes the Redfish update service.
VolumeCollection	1.0.0	Initial release. Collection of volumes.
Zone	1.0.0	Initial release. Describes a simple fabric zone.
ZoneCollection	1.0.0	Initial release. Collection of zones.

Schema name	Version	Description
Chassis	1.3.0	Added <code>IPBasedDrive</code> to <code>ChassisType</code> enumerations.
ComputerSystem	1.2.0	Added <code>HostedServices</code> and <code>HostingRoles</code> properties. Added <code>MemoryDomains</code> , <code>PCIeDevices</code> , <code>PCIFunctions</code> , and <code>Endpoints</code> links. Added <code>RemoteDrive</code> enumeration to <code>BootSourceOverrideTarget</code> .
Drive	1.1.0	Added <code>Operations</code> property and <code>Endpoints</code> link.
EthernetInterface	1.1.0	Added <code>LinkStatus</code> property and <code>Endpoints</code> link.
EventDestination	1.1.0	Added <code>OriginResources</code> and <code>MessageIds</code> properties.
LogEntry	1.1.0	Added <code>EventType</code> , <code>EventId</code> , and <code>EventTimeStamp</code> properties.
Manager	1.2.0	Added <code>PowerState</code> property.
MemoryMetrics	1.1.0	Added <code>PredictedMediaLifeLeftPercent</code> property to the <code>HealthData</code> object.
Power	1.2.0	Added <code>IndicatorLED</code> property to <code>PowerSupply</code> object.
Redundancy	1.1.0	Added <code>RedundancyEnabled</code> property.
Resource	1.2.0	Added <code>Deferring</code> , <code>Quiesced</code> , and <code>Updating</code> to <code>State</code> enumerations.
ServiceRoot	1.1.0	Added links to <code>Fabrics</code> , <code>StorageSystems</code> , <code>StorageServices</code> and <code>UpdateService</code> .
SessionService	1.1.0	Added OEM action capabilities.
Storage	1.1.0	Added <code>Links</code> object and <code>Endpoints</code> link.
ComputerSystem	1.1.1	Errata release. Clarified description of ComputerSystem and the <code>UUID</code> property.
ComputerSystem	1.0.3	Errata release. Clarified description of ComputerSystem and the <code>UUID</code> property.
Drive	1.0.1	Errata release. Added <code>Unencrypted</code> enumeration to <code>EncryptionStatus</code> and deprecated misspelled enumeration.
Event	1.1.1	Errata release. Deprecated <code>Context</code> property in favor of the Event-specific <code>Context</code> contained within each Event.
Event	1.0.3	Errata release. Deprecated <code>Context</code> property in favor of the Event-specific <code>Context</code> contained within each Event.
IPAddresses	1.0.3	Errata release. Corrected validation patterns for <code>IPv4Address</code> and <code>SubnetMask</code> . Added validation pattern for <code>Gateway</code> .
Message	1.0.3	Errata release. Corrected <code>MessageId</code> to mark it as a required property.
Resource	1.1.1	Errata release. Removed errant <code>ReferenceableMember</code> entity type.
ServiceRoot	1.0.3	Corrected validation pattern annotation for <code>RedfishVersion</code> .

Schema name	Version	Description
Storage	1.0.1	Corrected type definition of the <code>Volumes</code> link.
Volume	1.0.1	Corrected description of <code>VolumeType</code> .

### 3.24 Release 2016.1 (March 2016)

Schema name	Version	Description
AttributeRegistry	1.0.0	Initial release. A set of key-value pairs that are specific to a particular implementation or product, such that creating standardized property names would be impractical. This schema describes the structure of a registry, and also includes mechanisms for building user interfaces (menus) allowing consistent navigation of the contents.
Bios	1.0.0	Initial release. 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.
Drive	1.0.0	Initial release. Contains properties describing a single physical drive for any system, along with links to associated volumes.
Memory	1.0.0	Initial release. Describes a memory module or similar memory device as part of a system.
MemoryCollection	1.0.0	Initial release. A collection of memory devices.
MemoryMetrics	1.0.0	Initial release. Contains usage and health statistics for a single memory module or device instance.
SecureBoot	1.0.0	Initial release. UEFI Secure Boot information. It represents properties for managing the UEFI Secure Boot functionality of a system.
Storage	1.0.0	Initial release. 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.
StorageCollection	1.0.0	Initial release. A collection of storage instances.
Volume	1.0.0	Initial release. Contains properties used to describe a volume, virtual disk, LUN, or other logical storage entity for any system.



Schema name	Version	Description
(all files)	1.0.2	Errata release of all schema files to adjust file naming conventions. CSDL schema files now have the major version appended to the end of the schema name (e.g., Chassis_v1), and json-schema files include the major/minor/errata version number (matching the namespace definitions in the schema as they did previously) in the filename, but are now prefaced with a "v" and with underscore separators (e.g., Chassis.v1_0_2.json) to match the corrected namespace naming rules. Added long descriptions to <code>Links</code> and <code>Actions</code> objects throughout. Added unit, minimum, and maximum annotations throughout. Defined all unversioned resources in CSDL as <code>abstract</code> . Corrected all string properties with enumerations to allow use of null (nullable). Marked all <code>Links</code> and other <code>NavigationProperty</code> elements and embedded objects ( <code>ComplexType</code> elements) as non-nullable. Improved schema description text, updated RFC references, and white space consistency throughout.
(all Collections)	n/a	Corrected URI of the schema locations to the /schemas/v1 repository instead of the /schema location, which contains only the latest version of each schema. Corrected missing <code>anyOf</code> structure to allow <code>idRef</code> references to collections.
(all files)	various	Copies of all previously-released Redfish json-schema files have been created to follow the corrected json-schema filename format (v1_n_n instead of 1.n.n). The internal schema name references were updated to match this style, but otherwise the files are identical to their originally released content.
Chassis	1.2.0	Added <code>ManagersInChassis</code> , <code>Drives</code> , and <code>Storage</code> to <code>Links</code> .
Chassis	1.1.2	Errata release (see 1.0.2 errata description above). Corrected description for <code>ManagedBy</code> link. Deprecated <code>Unknown</code> enumeration value for <code>IndicatorLED</code> .
ComputerSystem	1.1.0	Added <code>Bios</code> , <code>Memory</code> , <code>Storage</code> , and <code>SecureBoot</code> properties. Added <code>MemoryMirroring</code> to the <code>MemorySummary</code> object. Added <code>TrustedModule</code> object. Added <code>BootSourceOverrideMode</code> to <code>Boot</code> object. Added <code>SDCard</code> and <code>UefiHttp</code> enumerations to <code>BootSourceOverrideTarget</code> in <code>Boot</code> object.
ComputerSystem	1.0.2	Errata release (see 1.0.2 errata description above). Deprecated <code>Unknown</code> enumeration value for <code>IndicatorLED</code> .
Event	1.1.0	Added <code>Context</code> property.
EventService	1.0.2	Errata release (see 1.0.2 errata description above). Corrected unit annotations to use UCUM unit definitions.
JsonSchemaFile	1.0.2	Errata release (see 1.0.2 errata description above). Corrected text in <code>Schema</code> property descriptions to reference <code>@odata.type</code> instead of <code>Type</code> .
Manager	1.1.0	Added <code>ManagerInChassis</code> to <code>Links</code> .
Manager	1.0.2	Errata release (see 1.0.2 errata description above). Corrected descriptions for <code>ServiceEntryPointUUID</code> to correctly match the intent of the property.
ManagerNetworkProtocol	1.0.2	Errata release (see 1.0.2 errata description above). Corrected read-write permissions on all embedded objects. Corrected unit annotations to use UCUM unit definitions.

Schema name	Version	Description
Power	1.1.0	Added <code>InputRanges</code> array and <code>Manufacturer</code> to <code>PowerSupplies</code> object. Added enumerations to the <code>LineInputVoltageType</code> property in <code>PowerSupplies</code> that promote better interoperability and deprecated others whose terminology differs in meaning among vendors.
Power	1.0.2	Errata release (see 1.0.2 errata description above). Corrected read-write permissions on all embedded objects. Corrected unit annotations to use UCUM unit definitions.
Resource	1.1.0	Added <code>Identifier</code> object, <code>Location</code> object and <code>IndicatorLED</code> definitions for use throughout the Redfish data model. Added <code>UnavailableOffline</code> enumeration to <code>State</code> in <code>Status</code> object.
Resource	1.0.2	Errata release (see 1.0.2 errata description above). Corrected missing required annotation on <code>Id</code> property. Added <code>Pattern</code> Redfish annotation for <code>oem</code> property names.
SessionService	1.0.2	Errata release (see 1.0.2 errata description above). Added unit annotations.
SimpleStorage	1.1.0	Added <code>CapacityBytes</code> to <code>Devices</code> object.
SimpleStorage	1.0.2	Errata release (see 1.0.2 errata description above). Corrected unit annotations to use UCUM unit definitions.
Thermal	1.1.0	Added <code>Name</code> to <code>Fan</code> object. Deprecated inconsistent <code>FanName</code> in <code>Fan</code> .
Thermal	1.0.2	Errata release (see 1.0.2 errata description above). Corrected read-write permissions on all embedded objects. Corrected unit annotations to use UCUM unit definitions.

### 3.25 Release 1.1 (November 2015)

Schema name	Version	Description
Chassis	1.1.0	Added <code>PhysicalSecurity</code> object for intrusion detection sensor support.

### 3.26 Release 1.0.1 (September 2015)

Schema name	Version	Description
Thermal	1.0.1	Errata release. Renamed <code>Fan</code> <code>ReadingRPM</code> property to <code>Reading</code> as it was determined that the initial definition was too limiting. Added <code>Fan</code> property <code>ReadingUnits</code> to allow for either RPM or percent-based fan readings. Corrected spelling errors throughout. Any future property name changes will result in a major version change to the schema file.
Chassis	1.0.1	Errata release. Added missing <code>PowerState</code> property intended for inclusion in v1.0.0. Corrected long description text of <code>CooledBy</code> . Clarified long description of <code>Reset</code> action.

Schema name	Version	Description
ComputerSystem	1.0.1	Errata release. Changed enumeration values of <code>PowerState</code> to reflect a better set of real-world use cases. Corrected annotation name in long description of <code>UefiTargetBootSourceOverride</code> .
Manager	1.0.1	Errata release. Corrected long description text for both <code>ManagerForChassis</code> and <code>ManagerForSystem</code> .
Power	1.0.1	Errata release. Corrected long description text for <code>IntervalInMin</code> .
VlanNetworkInterface	1.0.1	Errata release. Corrected maximum VLAN ID value.

### 3.27 Release 1.0 (August 2015)

Schema name	Version	Description
(all files)	1.0.0	Initial release.