Redfish Release 2020.3

- Redfish Specification v1.11.1
  - Errata release
- Redfish Host Interface Specification v1.3.0
  - Adds bootstrap credential method
- Redfish Schema Bundle 2020.3
  - DSP8010 contains all released Redfish schemas
- Redfish Message Registry Bundle 2020.3
  - DSP8011 contains all released Redfish registries
  - NEW Job and LogService message registries
  - Updated Privilege registry
  - Updated Base message registry to include argument descriptions for all messages
- **2 NEW Schemas, 37 updated schemas**
  - Addition of Connection and StorageController schema
  - Support for NVMe-over-Fabric
  - Support for collecting and retrieving DiagnosticData ("crash dumps")
  - Migration from NetworkPort to Port schema for consistency throughout model
  - Added support for per-system remote console and virtual media instances, expanded details of serial console
  - See release notes in DSP8010 for errata details
- Download all published material at: [http://www.dmtf.org/standards/redfish](http://www.dmtf.org/standards/redfish)
NEW Host Interface Specification Updates

• New credential bootstrapping feature added to the Redfish Host Interface Specification v1.3
• Added a set of IPMI commands to allow host software or the operating system to generate credentials for itself without requiring a-priori knowledge about the Redfish service
  • Previous UEFI variable mechanism for transporting host credentials has been deprecated in favor of this approach
• Additions to the HostInterface resource to control whether the credential bootstrapping feature is enabled, and control the role assigned to the bootstrap account
NEW Connection schema

- Added *Connection* to the fabric model
- A *Connection* resource is used to express the types of resources an endpoint can access when connected to another endpoint within a fabric
  - For example, if a storage initiator connects to a storage target, which volumes can the initiator access
- *Connection* maps *Endpoint* resources to other resources, and specifies the permissions for the resource
NEW StorageController schema

- Created *StorageController* to address scalability concerns
  - The Storage schema currently contains an object array for controllers
    - This property works for traditional HBAs or RAID adapters that have a physical controller, where the *Storage* resource contains only one or two controllers
  - Added a link in *Storage* to a *StorageController* resource collection
- A *StorageController* resource collection allows for cases where a single storage subsystem will have a more dynamic set of controllers
  - For NVMe-oF, controllers are created and retired as NVMe-oF hosts connect or disconnect from NVMe-oF targets
NEW NVMe-oF modeling using Redfish

• Additions made to the data model to support NVMe-oF
  • Storage added to ServiceRoot for showing externally accessible storage subsystems
  • Connection added to Fabric to allow mapping of Endpoints to other resources, such as Volumes
  • Drives added to Chassis to show drives within an enclosure
• Endpoints are used to represent NVMe-oF hosts and interfaces on an NVMe-oF subsystem
  • An Initiator Endpoint represents a host, and contains the host’s NQN
  • A Target Endpoint represents an interface to the subsystem, and contains the subsystem’s NQN as well as a reference to the NetworkDeviceFunction representing the physical interface
NEW NVMe-oF Modeling in Redfish

Diagram showing the NVMe-oF model in Redfish, with nodes representing systems, chassis, storage, fabrics, controllers, endpoint groups, networks, ports, and drives, connected by links indicating relationships and navigation paths.
Port schema updates, migration from NetworkPort

- Large overlap between Port and NetworkPort
  - Both schemas filled essentially the same purpose
  - Standardize on Port going forward
  - Properties added to Port that were present only in NetworkPort
- References to NetworkPort deprecated and references to Port added
  - NetworkAdapter
  - NetworkInterface
  - NetworkDeviceFunction
- Autospeed negotiation for network adapters now explicitly supported
  - AutoSpeedNegotiationEnabled - allows turning negotiation on/off
  - ConfiguredNetworkLinks - set of lane speed/count possibilities to which autospeed negotiation is restricted
NEW Diagnostic Data support in LogService / LogEntry

- Diagnostic data can be collected at any time and is stored in a file to troubleshoot problems that have occurred.
- The data may consist of a “crash dump”, application core, network configuration, system inventory configuration, journal log, etc.
- `LogService CollectDiagnosticData` action collects the diagnostic data.
  - Parameters `DiagnosticDataType` and `OEMDiagnosticDataType`.
- `LogEntry` adds support for referencing a diagnostic data file.
  - `AdditionalDataSizeBytes` - Size of the additional data file.
  - `AdditionalDataURI` - URI of the additional data file.
  - `DiagnosticDataType` - Type of diagnostic data.
    - Types include: `Manager`, `OEM`, `OS`, and `PreOs`.
  - `OEMDiagnosticDataType` – OEM-defined diagnostic data type.
    - Used when `DiagnosticDataType` is `OEM`.
NEW InfiniBand support

- Added `InfiniBand` to `NetDevFuncType` in `NetworkDeviceFunction` to be able to identify network devices that support InfiniBand
- Added `InfiniBand` property to `NetworkDeviceFunction` for containing InfiniBand specific properties
  - Port GUID
  - Node GUID
  - System GUID
  - MTU capabilities and configuration
**NEW LocationIndicatorActive property**

- Deprecates and replaces `IndicatorLED` property throughout the model
  - `IndicatorLED` improperly exposed hardware implementation details
    - Redfish attempts to model usage semantics rather than physical characteristics
  - This caused interoperability issues discovered during Redfish Plugfests
    - Some vendors use “On” as the active state, others use “Blinking”
    - Some vendors use “Off” as the inactive state, other use “On”
- `LocationIndicatorActive` property is a simple Boolean
  - True if the locator function is active, False if it is not in use
  - Added to `Assembly`, `Circuit`, `Chassis`, `ComputerSystem`, `Drive`, `Memory`, `Outlet`, `PCIeSlots`, `Port`, `Processor`, `Switch`
- For compatibility with existing clients, services should:
  - Implement both properties in `ComputerSystem`, `Chassis`, `Drive`, `Switch` instances where `IndicatorLED` already exists
  - Reflect changes (from user PATCH operations) in both properties
  - Replace `IndicatorLED` support in `Circuit`, `Outlet` as these are new schemas
Remote console and Virtual Media updates

- Remote console and virtual media properties moved to ComputerSystem
  - Allows clients to locate functionality in multi-node
- New VirtualMediaConfiguration object, VirtualMediaCollection link
  - Configuration object provides connection information per system
  - No changes to VirtualMedia resource collection definition
- SerialConsole
  - Support allows for multiple console protocols
    - SSH, Telnet, IPM-over-LAN Serial-over-LAN supported
    - SharedWithManagerCLI indicates console also allows access to Manager
    - ConsoleEntryCommand reports the command sequence client issues to access the host console once connected using the given protocol
    - HotKeySequenceDisplay provides text to client software to display to user showing the keyboard “hotkey” sequence used to exit the host console
Redfish Schema Minor Revisions (1 of 7)

- **AddressPool v1.1.0**
  - Added *Ethernet* property

- **Assembly v1.3.0**
  - Added *LocationIndicatorActive* and *Location* properties

- **Chassis v1.14.0**
  - Added *LocationIndicatorActive* and *Drives* properties
  - Deprecated *IndicatorLED* property in favor of *LocationIndicatorActive*

- **Circuit v1.1.0**
  - Added *LocationIndicatorActive* property
  - Deprecated *IndicatorLED* property in favor of *LocationIndicatorActive*

- **ComputerSystem v1.13.0**
  - Added *LocationIndicatorActive*, *BootProgress*, *SerialConsole*, *GraphicalConsole*, *VirtualMediaConfig*, *VirtualMedia*, *PowerOnDelaySeconds*, *PowerOffDelaySeconds*, and *PowerCycleDelaySeconds* properties
  - Deprecated *IndicatorLED* property in favor of *LocationIndicatorActive*
Redfish Schema Minor Revisions (2 of 7)

- **Drive v1.11.0**
  - Added `LocationIndicatorActive` property
  - Deprecated `IndicatorLED` property in favor of `LocationIndicatorActive`

- **Endpoint v1.5.0**
  - Added `Manager` and `Connections` properties

- **EndpointGroup v1.3.0**
  - Initial transition from SNIA contribution to DMTF
  - Deprecated `AccessState` in favor of `AccessState` in Connection. Deprecated `Endpoints` in favor of `Endpoints` in Links. Deprecated `Client` and `Server` in favor of `Initiator` and `Target`. Added `Connections` to `Links`
  - Added `Connections` property

- **Event v1.6.0**
  - Added `SpecificEventExistsInGroup` property
Redfish Schema Minor Revisions (3 of 7)

- **EventDestination v1.9.0**
  - Added `Certificates`, `VerifyCertificate`, `SyslogFilters`, `OEMProtocol`, and `OEMSubscriptionType` properties
  - Added syslog-related values to `Protocol` and `SubscriptionType`
- **Fabric v1.2.0**
  - Added `EndpointGroups` and `Connections` properties
- **HostInterface v1.3.0**
  - Added `CredentialBootstrapping` property and `CredentialBootstrappingRole` to `Links`
  - Deprecated `KernelAuthRoleId`, `KernelAuthEnabled`, `FirmwareAuthRoleId`, `FirmwareAuthEnabled`, `KernelAuthRole`, and `FirmwareAuthRole` in favor of new credential bootstrapping properties
- **LogEntry v1.7.0**
  - Added `AdditionalDataSizeBytes`, `AdditionalDataURI`, `DiagnosticDataType`, `OEMDiagnosticDataType` properties
- **LogService v1.2.0**
  - Added `SyslogFilters` property and `CollectDiagnosticData` action
Redfish Schema Minor Revisions (4 of 7)

- Manager v1.10.0
  - Added TimeZoneName property
  - Deprecated VirtualMedia and SerialConsole properties in favor of those added to ComputerSystem
- Memory v1.10.0
  - Added LocationIndicatorActive property
- MemoryChunks v1.4.0
  - Added DisplayName property
- MemoryMetrics v1.4.0
  - Added CorrectableECCErrorCount and UncorrectableECCErrorCount properties to CurrentPeriod and LifeTime
- MetricDefinition v1.1.0
  - Added OEMCalculationAlgorithm property and OEM value to CalculationAlgorithm
- NetworkAdapter v1.5.0
  - Deprecated NetworkPorts property in favor of Ports to leverage the common Port schema
Redfish Schema Minor Revisions (5 of 7)

- **NetworkDeviceFunction v1.5.0**
  - Added *Infiniband* property and *MTUSizeMaximum* to *Ethernet*
  - Deprecated *AssignablePhysicalPorts* and *PhysicalPortAssignment* properties in favor of *AssignablePhysicalNetworkPorts* and *PhysicalNetworkPortAssignment* to leverage the common Port schema

- **NetworkInterface v1.3.0**
  - Deprecated *NetworkPorts* property in favor of *Ports* to leverage the common Port schema

- **NetworkPort v1.3.0**
  - Added *Starting* and *Training* values to *LinkStatus*

- **Outlet v1.1.0**
  - Added *LocationIndicatorActive* property
  - Deprecated *IndicatorLED* property in favor of *LocationIndicatorActive*

- **PCIeDevice v1.5.0**
  - Added *UUID* property
Redfish Schema Minor Revisions (6 of 7)

- PCIeSlots v1.4.0
  - Added LocationIndicatorActive property
- Port v1.3.0
  - Added LocationIndicatorActive, MaxFrameSize, LinkConfiguration, FibreChannel, and Ethernet properties
- Processor v1.10.0
  - Added LocationIndicatorActive, BaseSpeedMHz, SpeedLimitMHz, and SpeedLocked properties
  - Added ProtectedIdentificationNumber to ProcessorId
- Protocol
  - Added Ethernet and Infiniband values
- Resource v1.10.0
  - Added NGUID to DurableName
- ServiceRoot v1.9.0
  - Added Storage property
Redfish Schema Minor Revisions (7 of 7)

- **Session v1.3.0**
  - Added `ClientOriginIPAddress` property
- **SimpleStorage v1.3.0**
  - Added `Storage` to `Links`
- **Storage v1.9.0**
  - Added `Controllers` and `Identifiers` properties
  - Added `SimpleStorage` and `StorageServices` to `Links`
- **Switch v1.4.0**
  - Added `LocationIndicatorActive`, `CurrentBandwidthGbps`, and `MaxBandwidthGbps` properties. Added `PCIeDevice` to `Links`
  - Deprecated `IndicatorLED` property in favor of `LocationIndicatorActive`
- **Task v1.5.0**
  - Added `SubTasks` property
- **Zone v1.5.0**
  - Added `AddEndpoint` and `RemoveEndpoint` actions
Errata Schema Revisions (1 of 5)

- **AccountService v1.x.x**
  - Clarified that `MinPasswordLength` and `MaxPasswordLength` do not apply to external accounts
  - Fixed writable permission for `MinPasswordLength` and `MaxPasswordLength`
  - Clarified that `AuthFailureLoggingThreshold` applies per account

- **AttributeRegistry v1.x.x**
  - Clarified the evaluation order for `Dependencies` containing multiple logic expressions.

- **Chassis v1.x.x**
  - Added recommendation for using `@Redfish.AllowableValues` for `ResetType` for compatibility with older clients
Errata Schema Revisions (2 of 5)

- **ComputerSystem v1.x.x**
  - Removed restriction in the `UefiTargetBootSourceOverride` to allow for `Continuous` to be used with `UefiTarget`
  - Clarified that `ProcessorySummary` only contains processors that execute system code
  - Added recommendation for using `@Redfish.AllowableValues` for `ResetType` for compatibility with older clients

- **EthernetInterface v1.x.x**
  - Clarified several descriptions to state the difference between IP addresses that are currently in use versus addresses that are requested to be assigned

- **Event v1.x.x**
  - Clarified that `Severity` and `MessageSeverity` in responses can be service-defined and not come from a message registry
Errata Schema Revisions (3 of 5)

- **IPAddresses v1.x.x**
  - Clarified the description of the IPv4 Gateway property to show that there should only be one gateway per interface if multiple addresses are allowed

- **Job v1.x.x**
  - Clarified that steps of jobs cannot have their own steps

- **LogEntry v1.x.x**
  - Corrected the description for SensorNumber to show that it only applies for entries of type SEL

- **Manager v1.x.x**
  - Added recommendation for using @Redfish.AllowableValues for ResetType for compatibility with older clients
Errata Schema Revisions (4 of 5)

- **ManagerNetworkProtocol v1.x.x**
  - Clarified the SNMP AuthenticationProtocol property does not apply when EncryptionProtocol contains the value Account and instead is determined based on the settings of individual accounts.
  - Clarified usage of VirtualMedia and KVMIP properties that they apply to all systems managed by the manager

- **Message, MessageRegistry v1.x.x**
  - Clarified that Severity and MessageSeverity in responses can be service-defined and not come from a message registry

- **MetricDefinition v1.0.5**
  - Clarified CalculationParameters to show it should be used when ImplementationType is Synthesized or Calculated

- **MetricReportDefinition v1.x.x**
  - Corrected permissions for ReportActions, ReportUpdates, MetricId, and properties in Wildcards to be writable
Errata Schema Revisions (5 of 5)

- **OperatingConfig v1.0.1**
  - Clarified the description for `BaseSpeedMHz` to show it's the nominal speed
- **Port v1.x.x**
  - Clarified the descriptions for `Starting` and `Training`
- **Settings v1.x.x**
  - Clarified usage of the `SupportedApplyTimes` property to state that having a single member is valid for conveying a non-configurable apply time
- **UpdateService v1.x.x**
  - Clarified the descriptions of `FirmwareInventory` and `SoftwareInventory` to explain the types of members to find in their respective collections
  - Clarified that `TransferProtocol` in `SimpleUpdate` is ignored if the scheme is provided in the URI
- **(various) v1.x.x**
  - Corrected permissions and update capabilities

- **Guide documents are updated for each schema (DSP8010) release**
  - Description text for properties taken directly from schema files
  - DMTF documentation generator creates these guide documents
  - Presents schema definition contents in a more human-readable format
  - Includes example payloads for each schema
- **Redfish Property Guide (DSP2053)**
  - Provides an alphabetical list of all properties defined in Redfish schema
  - Useful for schema writers to locate existing definitions or properties
  - Helps avoid re-defining property names already in use
- **Redfish Schema Supplement (DSP0268)**
  - Presents normative (“LongDescription”) schema definition contents
  - Useful for Redfish Service developers to ensure conformance