Redfish Cable Management proposal

DMTF Redfish Forum

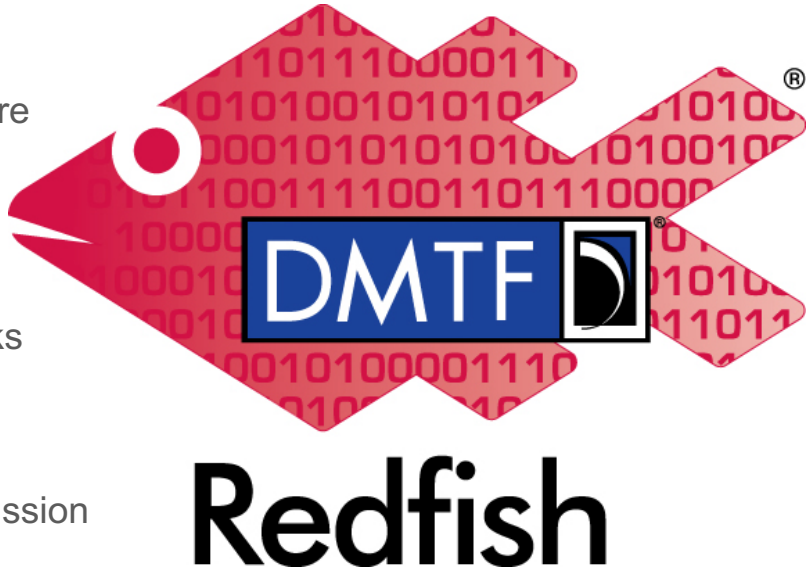
v0.8 - April 2021

Disclaimer

- The information in this presentation represents a snapshot of work in progress within the DMTF.
- This information is subject to change without notice. The standard specifications remain the normative reference for all information.
- For additional information, see the DMTF website: www.dmtf.org

Getting involved in Redfish

- Redfish Standards page
  - Schemas, Specs, Mockups, White Papers & more
  - http://www.dmtf.org/standards/redfish
- Redfish Developer Portal
  - Redfish Interactive Resource Explorer
  - Educational material, documentation & other links
  - http://redfish.dmtf.org
- Redfish User Forum
  - User forum for questions, suggestions and discussion
  - http://www.redfishforum.com
- DMTF Feedback Portal
  - Provide feedback or submit proposals for Redfish standards
  - https://www.dmtf.org/standards/feedback
- DMTF Redfish Forum
  - Join the DMTF to get involved in future work
  - http://www.dmtf.org/standards/spmf



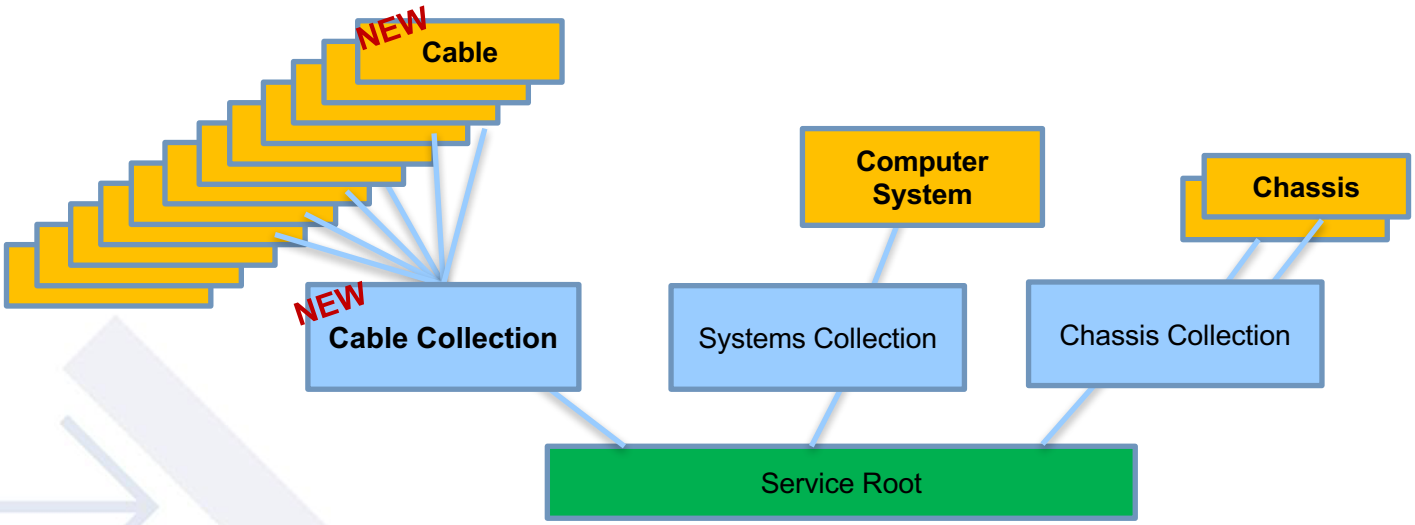
Goal: Define new Cable resource

- Connectivity information
  - Upstream and downstream attachments
  - Cable types and supported protocols
  - Location within a physical system
  - Generic support for point-to-point, fan-out, and multipoint cables
- Assembly information
  - Part numbers, serial numbers, manufacturer, length, etc.

Assumptions on usage

- Cable Collection will probably be externally managed
  - Not all cables can be actively managed by a computer system: allow users to enter this information into the Redfish model
    - e.g. passive HDMI cable, power cables
- Cables can be proprietary and unique to the user
  - We will define enums for common types, while leaving freeform descriptions available for client-specific information not captured in the general types

Cable resource tree additions



CABLE SCHEMA

Cable Definition: SATA Cable Example

```
{
 "@odata.type": "#Cable.v1_0_0.Cable",
 "@odata.id": "/redfish/v1/Cables/sata0",
 "Id": "sata0",
 "Description": "SATA Cable",
 "UpstreamName": "SATA0",
 "DownstreamName": "sda",
 "CableDescription": "SATA",
 "UpstreamConnectorTypes": [ "SATA" ],
 "DownstreamConnectorTypes": [ "SATA" ],
 "LengthMeters": 0.05,
 "Links": {
  "UpstreamPorts": [
   { "@odata.id": "/redfish/v1/Systems/system/Storage/1/Controllers/1/Ports/1" }
  ],
  "DownstreamResources": [
   { "@odata.id": "/redfish/v1/Chassis/chassis/Drives/1" }
  ]
 },
 "PartNumber": "EZS2JM",
 "Manufacturer": "Satasaurus Co.",
 "SerialNumber": "123456",
 "Vendor": "Cablestore",
 "ReportableStatus": {
    "Health": "OK"
 }
}
```

Upstream/DownstreamName are freeform string descriptions for a cable's endpoints

Upstream/DownstreamConnectorTypes is an array to support multipoint-to-multipoint cables

Upstream/Downstream Links can be to Ports, Chassis, or Resources

ReportableStatus would allow user to update the status manually if needed

Cable Definition: Power Cable Example


```
{
 "@odata.type": "#Cable.v1_0_0.Cable",
 "@odata.id": "/redfish/v1/Cables/power0",
 "Id": "power0",
 "Name": "Main Power Cable",
 "Description": "Power Cable",
 "UpstreamName": "POWER",
 "DownstreamName": "Outlet",
 "ReportableStatus": "Present",
 "CableDescription": "Power",
 "LengthMeters": 0.5,
 "UpstreamConnectorTypes": [ "DCPower" ],
 "DownstreamConnectorTypes": [ "DCPower" ],
 "Links": {
  "UpstreamChassis": [
   { "@odata.id": "/redfish/v1/Chassis/chassis" }
  ]
 },
 "PartNumber": "60320",
 "Manufacturer": "Farm To Cable Inc.",
 "SerialNumber": "123456",
 "Vendor": "Cablestore",
 "ReportableStatus": {
   "Health": "OK"
 }
}
```


Upstream/Downstream Links may not have an endpoint if the cable is connected to something not modelled in the Redfish implementation

Cable Definition: Optical Cable Example

```
{
 "@odata.type": "#Cable.v1_0_0.Cable",
 "@odata.id": "/redfish/v1/Cables/splitter0",
 "Id": "splitter0",
 "Description": "Passive Optical Cable Splitter",
 "UpstreamName": "op_in",
 "DownstreamName": "op_out",
 "CableDescription": "Splitter",
 "UpstreamConnectorTypes": [ "QSFP" ],
 "DownstreamConnectorTypes": [ "QSFP", “QSFP”, “QSFP”, “QSFP” ],
 "Links": {
  "UpstreamPorts": [
   { "@odata.id": "/redfish/v1/Chassis/main/NetworkAdapters/0/Ports/1" }
  ],
  "DownstreamResources": [
   { "@odata.id": "/redfish/v1/Systems/1/NetworkInterfaces/0" },
   { "@odata.id": "/redfish/v1/Systems/2/NetworkInterfaces/0" },
   { "@odata.id": "/redfish/v1/Systems/3/NetworkInterfaces/0" },
   { "@odata.id": "/redfish/v1/Systems/4/NetworkInterfaces/0" },
  ]
 },
 "PartNumber": "EZS2JM",
 "Manufacturer": “Cellulose Networks",
 "SerialNumber": "123456",
 "Vendor": "Cablestore",
 "ReportableStatus": {
    "Health": "OK"
 }
}
```

CableDescription is a freeform string and not an enum

Upstream/DownstreamConnectorTypes is an array of enums to support multipoint-to-multipoint cables

Upstream/Downstream Links are arrays to support multiple endpoints

Proposed Connector Type Enums

- Common connector types
  - ACPower
  - DCPower
  - DisplayPort
  - Ethernet
  - HDMI
  - ICI
  - IPASS
  - PCIe
  - Proprietary
  - RJ45
  - SATA
  - SCSI
  - SlimSAS
  - USB
  - USBC
  - QSFP

Prefer to use the name “Proprietary” over “OEM”

Links

- Upstream and Downstream links
  - v1 will include links to one of Resource, Chassis, or Ports
  - Future revisions can include one of the v1 Links as a “superset” link to ensure backwards compatibility with v1 clients
  - Clients will know that they can always look at v1 resources to discover all relevant links

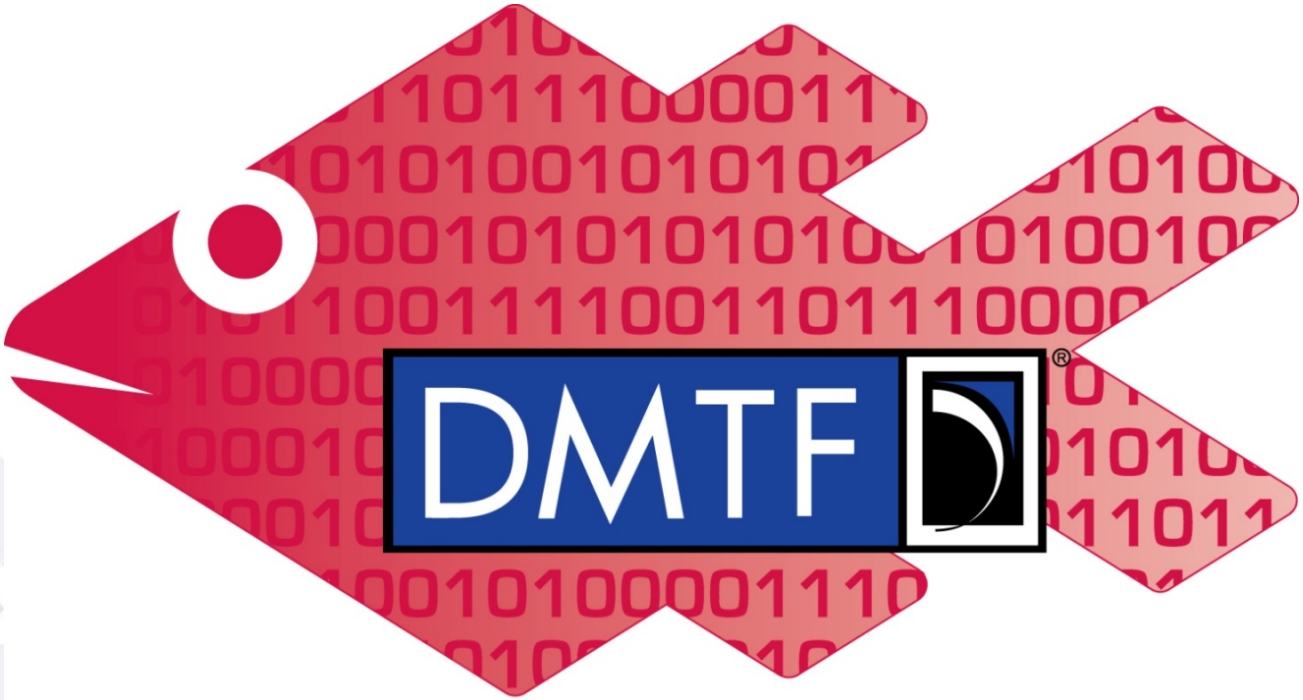
```
"Links": {
  "DownstreamHyperdriveEngines": [
    { "@odata.id": "/redfish/v1/Chassis/Falcon/Engines/1" }
  ],
  "DownstreamResources": [
    { "@odata.id": "/redfish/v1/Chassis/Falcon/Engines/1" }
  ]
}
```

Hypothetical future Resource with a link to Cable. The link will include the future specific resource alongside a v1 resource for backwards compatibility

Areas for Feedback

- Are the basic fields sufficient in capturing common use cases?
- Are the enums sufficient in capturing most common types?
- Do we anticipate any issues with future extensibility?

Q&A & Discussion



Redfish

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Appendix: Proposed properties for Cable schema

- CableDescription: *string*
- LengthMeters: *decimal*
- DownstreamName: *string*
- UpstreamName: *string*
- Model: *string*
- Manufacturer: *string*
- Vendor: *string*
- SKU: *string*
- SerialNumber: *string*
- PartNumber: *string*
- AssetTag: *string*
- Up|DownstreamConnectorTypes: *Collection(Cable.ConnectorType)*
- ReportableStatus: *string*
- Location: *Resource.Location*
- Assembly: *Assembly.Assembly*
- Links:
  - Up|DownstreamChassis: *Collection(Chassis.Chassis)*
  - Up|DownstreamPort: *Collection(Port.Port)*
  - Up|DownstreamResource: *Collection(Resource.Resource)*