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Tools and Process for Creating a Redfish Profile

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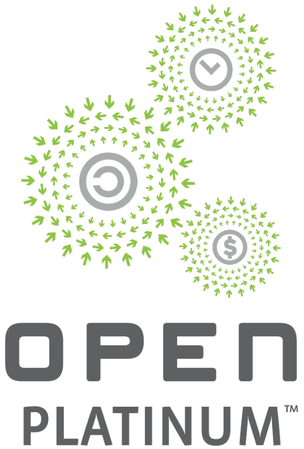

Redfish Profiles and OCP

MANAGEMENT

- Standard format for specifying Redfish support
- Easy method to communicate level of implementation
  - Redfish has independent versions for each schema
  - Common question “What version of Redfish do you support?” is not meaningful as this doesn’t equate to implementation
- HW Management project has produced a “Baseline” profile
  - Server project is extending that with a “Server” profile
  - Other projects can extend Baseline for their equipment

Redfish Profile Document

MANAGEMENT

Simple JSON document structure

- Based on resource and property requirements
- Format allows easy comparison to a retrieved Redfish payload
  - Ex. “PropertyRequirements” object with Redfish properties
- Can build definition on top of other Profile(s)
- Also allows specification of Redfish Protocol features, Resources/Properties, Actions and Registries.

Profile Versioning

Versioning support in both Profile and Resource requirements

- Profile is a static definition once published, and does not increase in scope as schemas add functionality
  - Recommend “new versions” of Profiles just use a new name
- Schema (resource) Versions are “<major>.<minor>.<errata>”
  - Major version: Client and Service must match major version
  - Minor version: New, backwards-compatible functionality added
  - Errata: Bug fixes or clarifications (no functional change)

Profile Document Structure

- Each section a JSON object
- Resource (schema) and Registry objects follow the names of the defining schema
- e.g. “EthernetInterface”
- Property-level requirement nested within Resource requirements, named to follow the defined property name
- e.g. “AssetTag”, “SpeedMbps”

Profile-level information and Protocol Requirements

```
{
 "SchemaDefinition": "RedfishInteroperabilityProfile.v1_0_0",
 "ProfileName": "OCPServerHardwareManagement",
 "ProfileVersion": "0.2.3",
 "Purpose": "Specifies the OCP management requirements for the
             Redfish interface on OCP Server platforms",
 "OwningEntity": "Open Compute Project",
 "ContactInfo": "redfish@opencompute.org",
 "RequiredProfiles": {
    "OCPBaselineHardwareManagement": {
       "MinVersion": "1.0.0"
     }
 },
 "Protocol": {
    "MinVersion": "1.0",
     "Discovery": "Recommended",
     "HostInterface": "Recommended"
 },
```

- Basic information
- Name, version, author, etc.

- Ability to include other Profiles to build upon past work
- But profile cannot loosen requirements included from other profiles, only add additional requirements
- “Protocol requirements” are Redfish features which are not part of the JSON response payload(s)
  - For OCP profiles, these are covered by Baseline – and are included here just as an example…

Resource (schema) level requirements

```
"Chassis": {
  “MinVersion”: “1.0.0”,
  "PropertyRequirements": {
    "AssetTag": {
       "ReadRequirement": "Recommended",
       "WriteRequirement": "Recommended"
    },
    "ChassisType": {},
    "IndicatorLED": {
       "ReadRequirement": "Recommended",
       "WriteRequirement": "Recommended"
    },
    "Manufacturer": {},
    "Model": {},
    "SerialNumber": {},
    "SKU": {
       "ReadRequirement": "Recommended"
    },
      . . .
```

- Organized by schema name
- Profile can include requirements from any number of standard schemas
- Resource level “ReadRequirement” sets need for schema-required properties
- Property level requirements contained in resource-level object
- “MinVersion” – minimum schema version required

Property-level basic features

```
"PropertyRequirements": {
   "Temperatures": {
     "ReadRequirement": "Mandatory",
     "MinCount": 3,
     “PropertyRequirements": {
       "ReadingCelsius": {},
       "PhysicalContext": {
       "Comparison": "AllOf",
       “Values": ["CPU", "Intake",
                  "SystemBoard"]
       },
       "UpperThresholdFatal": {
          "ReadRequirement": "Recommended"
       },
       "UpperThresholdCritical": {
          "ReadRequirement": "Recommended"
       }
    . . .
```

JSON objects follow property names

- Un-listed properties have no requirements
- Empty objects are by default ‘Mandatory’

“ReadRequirement”:

- Default value is ‘Mandatory’
- Recommended, If-Implemented, and Conditional support

“MinCount”:

- Minimum count of non-NULL items in array

“WriteRequirement”:

- If property must support PATCH or PUT

“Values”:

- Require specific or “any of these” values for a property. Also supports arrays

Property-level Conditional Requirements

```
"EthernetInterface": {
  "PropertyRequirements": {
    “HostName": {
      “ReadRequirement": "Recommended",
      “ConditionalRequirements": [{
        "SubordinateToResource":
          ["ComputerSystem“,
           ”EthernetInterfaceCollection”],
         “ReadRequirement": “Mandatory"
        }]
      },
      "IPv4Addresses": {
        “ReadRequirement": “Mandatory",
        "MinCount": 1,
        “ConditionalRequirements": [{
          "SubordinateToResource":
            ["ComputerSystem“,
             “EthernetInterfaceCollection”],
          “ReadRequirement": “Mandatory“,
          "MinCount": 2
         }]
}
```

- “ConditionalRequirements”: Apply to the property if one or more conditions are met
- “Purpose”: Text provides justification for the conditional requirement
- “SubordinateToResource”: If resource matches the parent hierarchy, requirement applies
- Comparison Property / Values: Using another property within the resource as key, add requirement if value of the key matches a list

Property level – ‘Conditional’ Value example

```
"IndicatorLED": {
   “ReadRequirement": "Recommended",
   “WriteRequirement”: “Recommended”,
   "ConditionalRequirements": [{
      "Purpose": "Physical and composed Systems
 must have a writable Indicator LED“,
      “ReadRequirement": “Mandatory",
      “WriteRequirement”: “Mandatory”,
      “Comparison": "AnyOf",
      “CompareProperty": "SystemType",
      “CompareValues": ["Physical", "Composed“]
   }]
}
```

- ‘Comparison’ provides test
- ‘CompareProperty’ name
- May be at current object level or in parent objects (no peers)
- ‘CompareValues’ – one or more values to test against
- Requirement – applies if condition met
- ‘ConditionalRequirements’ is an array, allowing multiple conditions for a given property

Action-level features

```
“ActionRequirements": {
   "Reset": {
      “ReadRequirement": “Mandatory",
      "Parameters": {
         "ResetType": {
         “MinSupportedValues": ["ForceOff",
                                "PowerCycle"]
         }
      }
   }
}
```

Organized by Action name within each Resource (schema)

Allows for parameter requirements

AllowableValues support

Message Registry-level features

```
"Registries": {
   "Base": {
      "MinVersion": "1.0.0",
      “Repository": “http://redfish.dmtf.org/registries",
      "Messages": {
         "Success": {},
         "GeneralError": {},
         "Created": {},
         "PropertyDuplicate": {}
      }
   },
   "ContosoPizzaMessages": {
      “Repository": “http://contoso.com/registries",
      "ReadRequirement": “Mandatory"
   }
}
```

- Organized by registry name
- Allows for multiple registries
- Ability to include OEM registries
- Resource level “ReadRequirement” sets need for full Registry requirement
- Messages listed with individual ‘Requirement’ as needed
- Note that OCP Profiles currently have no Registry requirements

Profile specifications

- Download from DMTF site: http://www.dmtf.org/standards/redfish
- Redfish Interoperability Specification (DMTF document DSP0272)
  - Defines the JSON document structure used in this presentation
- Profile Bundle (DMTF document DSP8013)
  - Includes a JSON Schema document useful for validating a Profile
  - Sample profile document showing examples of the profile structure and features
  - Future releases of this bundle will contain published Profiles

Profile tools

- Use a JSON schema validator to verify your profile document
  - Ensures document meets format defined by the specification
  - Such as: https://www.jsonschemavalidator.net/
- Profile Interop Validator
  - Open source tool to check a Redfish Service implementation against the Profile
  - https://github.com/DMTF/Redfish-Interop-Validator
- Documentation generator
  - Open source tool combines Profile document with Redfish schemas
  - Will automatically produce a “user guide” specific to your Profile
  - https://github.com/DMTF/Redfish-Tools

Call to Action

Create profile(s) for your OCP project

- Build from the OCP Baseline profile
- Get OCP Incubation Committee approval for the profile

Publish your profile document (and user guide)

- On OCP project page
- Submit for re-publication via DMTF's profile repository
  - Published profiles included in DSP8013 bundle

Direct implementations to test conformance using the OCP Conformance Test Suite


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