

An abstract graphic on the left side of the image, composed of numerous thin, light green lines that curve and swirl together to form a complex, organic shape resembling a stylized flower or a dynamic energy field.

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**OCP**  
SUMMIT

## OCP Profiles for Hardware Management

Hemal Shah

Hardware Management Project Co-lead, OCP

Distinguished Engineer/Architect, Compute and Connectivity (CCX), Broadcom Inc.

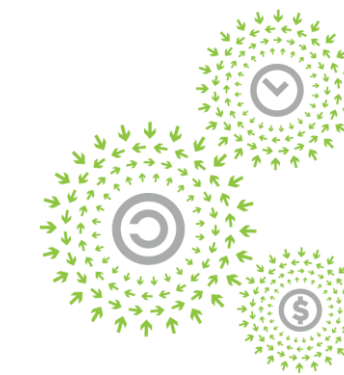


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COMMUNITY®

John Leung

OCP Incubation Committee - Liaison to the HW Management Project

Principal Engineer, Data Center Group, Intel Corporation

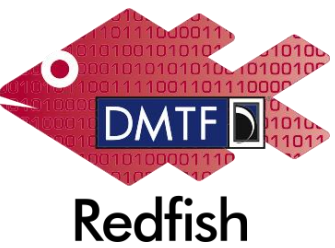


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# DMTF's Redfish<sup>1</sup>



A modern RESTful interface for manageability

- Uses cloud/web protocols, structures, security models and tool chains
- Schemas are accessible so client-side code can be auto-generated (json-schema, OpenAPI, OData CSDL)
- Manageability is defined by the resource URI and the JSON response format

**HTTP/S**

```
HTTP GET https://<ip_addr>/redfish/v1/Systems/CS_1
```

**Python  
code**

```
rawData = urllib.urlopen('https://<ip_addr>/redfish/v1/Systems/CS_1')  
jsonData = json.loads(rawData)  
print( jsonData['SerialNumber'] )
```

**Output**

```
1A87CA442K
```

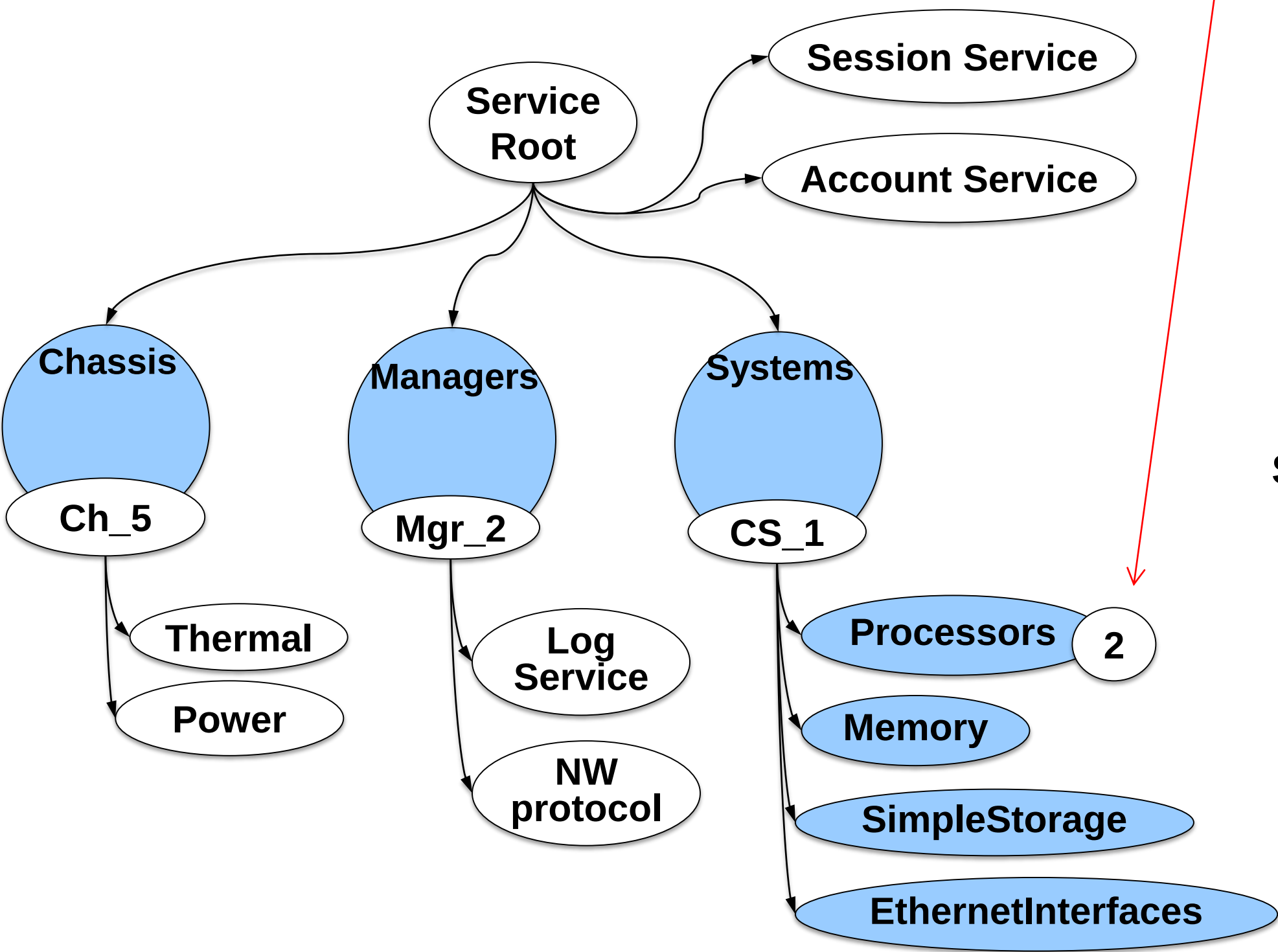
<sup>1</sup>redfishforum.com or redfish.dmtf.org



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# A Resource URI and a JSON response

HTTP GET /redfish/v1/Systems/CS\_1/Processors/2



 Collection resource  
 Singleton resource

Simple properties

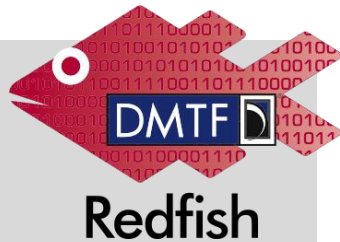
Complex properties

Subordinate resources

Associated resources

Actions

```
{
  "@odata.id": "/redfish/v1/Systems/CS_1",
  "Id": "CS_1",
  "Name": "My Computer System",
  "SystemType": "Physical",
  "AssetTag": "free form asset tag",
  "Manufacturer": "Manufacturer Name",
  "Model": "Model Name",
  "SerialNumber": "2M220100SL",
  "PartNumber": "78899498CLF-7",
  "UUID": "00000000-0000-0000-0000-000000000000",
  "HostName": "web-srv344",
  "PowerState": "On",
  "BiosVersion": "P79 v1.00 (09/20/2013)",
  "Status": { "State": "Enabled", "Health": "OK", "HealthRollup": "OK" },
  "Boot": { ... },
  "ProcessorSummary": { ... },
  "MemorySummary": { ... },
  "TrustedModules": [ { ... } ],
  "Processors": { "@odata.id": "/redfish/v1/Systems/CS_1/Processors" },
  "Memory": { "@odata.id": "/redfish/v1/Systems/CS_1/Memory" },
  "EthernetInterfaces": { "@odata.id": "/redfish/v1/Systems/CS_1/EthernetInterfaces" },
  "SimpleStorage": { "@odata.id": "/redfish/v1/Systems/CS_1/SimpleStorage" },
  "LogServices": { "@odata.id": "/redfish/v1/Systems/CS_1/LogServices" },
  "SecureBoot": { "@odata.id": "/redfish/v1/Systems/CS_1/SecureBoot" },
  "Bios": { "@odata.id": "/redfish/v1/Systems/CS_1/Bios" },
  "PCIeDevices": [ { "@odata.id": "/redfish/v1/Chassis/CS_1/PCIeDevices/NIC" } ],
  "Links": {
    "Chassis": [ { "@odata.id": "/redfish/v1/Chassis/Ch_1" } ],
    "ManagedBy": [ { "@odata.id": "/redfish/v1/Managers/Mgr_1" } ],
    "Endpoints": [ { "@odata.id": "/redfish/v1/Fabrics/PCIe/Endpoints/HostRootComplex1" } ],
  },
  "Actions": {
    "#ComputerSystem.Reset": {
      "target": "/redfish/v1/Systems/CS_1/Actions/ComputerSystem.Reset",
      "@Redfish.ActionInfo": "/redfish/v1/Systems/CS_1/ResetActionInfo"
    }
  }
}
```



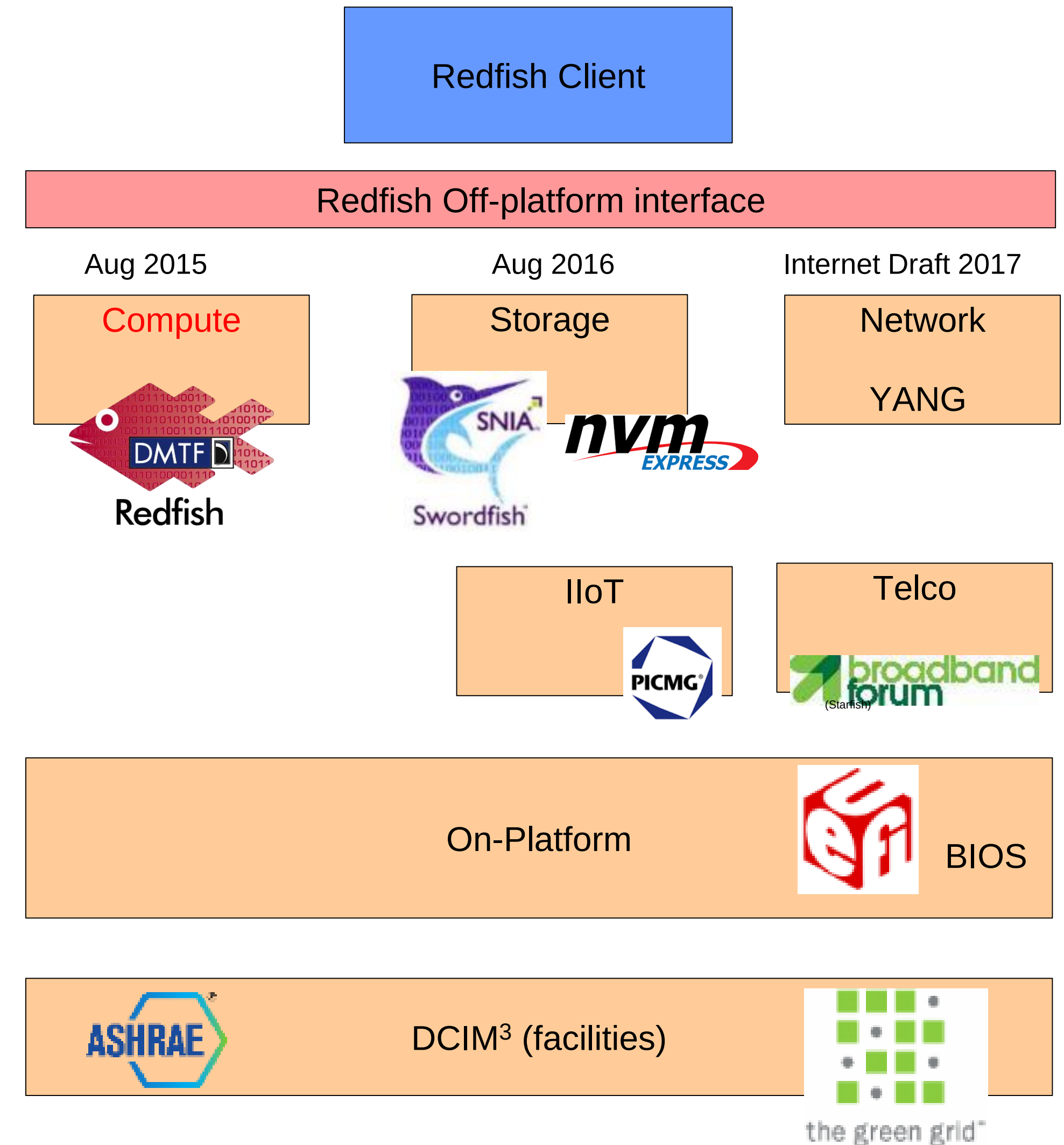
# Capabilities of Compute Model

- **Chassis Information**
  - Identification and asset information
  - State and status
  - Temperature sensors and fans
  - Power supply, power consumption and thresholds
  - Set power thresholds
- **Compute Manageability**
  - Reboot and power cycle server
  - Configure BIOS settings
  - Change boot order and device
  - Update BIOS and firmware
  - Memory and NVDIMMs
  - Local network interface
  - Local storage
  - State and status
- **Management Infrastructure**
  - View / configure BMC network settings
  - Manage local BMC user accounts
  - Configure serial console access (e.g. SSH)
- **Discovery**
  - Physical hierarchy (rack/chassis/server/node)
  - Compute service (servers)
  - Management hierarchy (rack mgr, tray mgr, BMC)
- **Security**
  - HTTPS
  - Map roles to privileges
- **Access and Notification**
  - Subscribe to published events
  - Inspect Logs
  - Host interface for in-band access
- **Composition**
  - Specific composition
  - Constrained composition

# Extending Redfish manageability

Domain experts from other SDO's are extending Redfish

- Networked storage, storage services, and non-volatile storage (**SNIA, NVMeExpress**)
- Ethernet Switch - map YANG to Redfish
- BIOS interface (**UEFI**)
- DC facilities infrastructure devices (**The Green Grid, ASHRAE**)
- Industrial IoT (**PICMG**)
- Customer Premise Equipment (**Broadband Forum**)



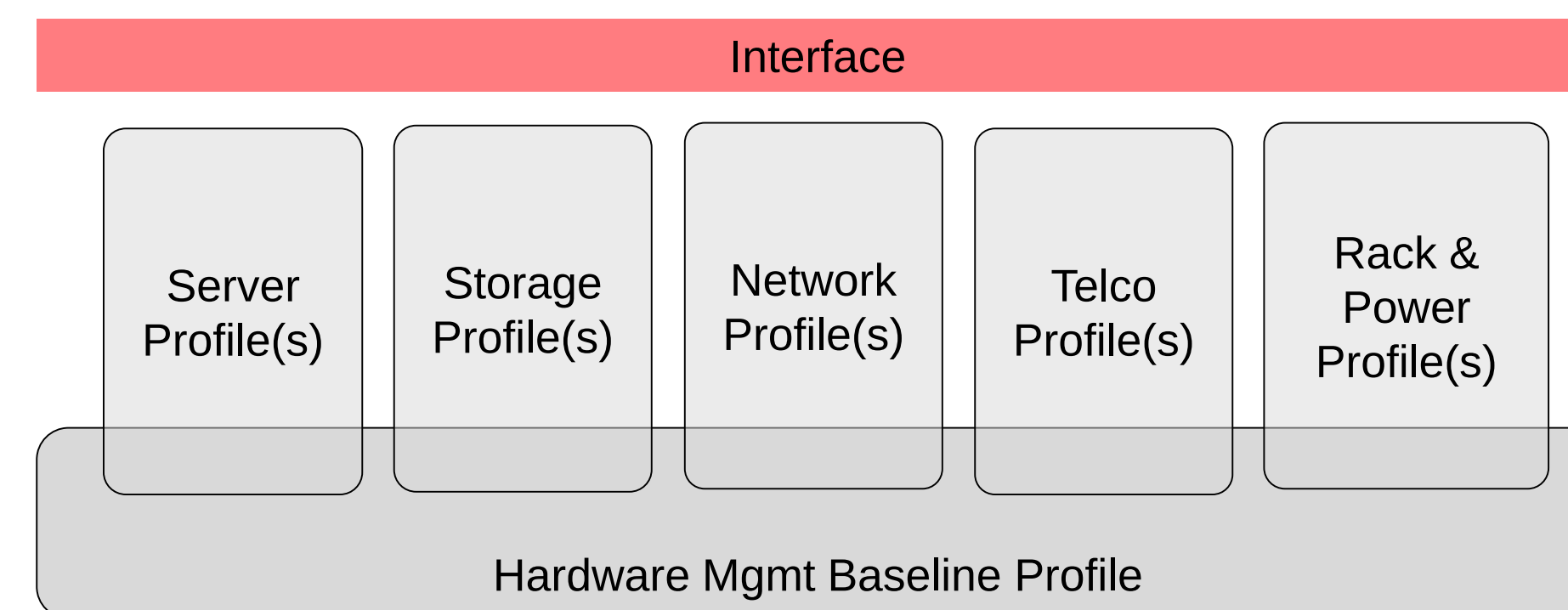
# OCP Platform Manageability based on Redfish

The Hardware Management Project created a baseline hardware management profile

- Includes a set of manageability common across OCP platforms
- Specified as an OCP Profile

Other OCP projects may create platform level profiles

- May extend the baseline hardware management profile to include platform specific requirements



# OCP Profiles

## Profile file

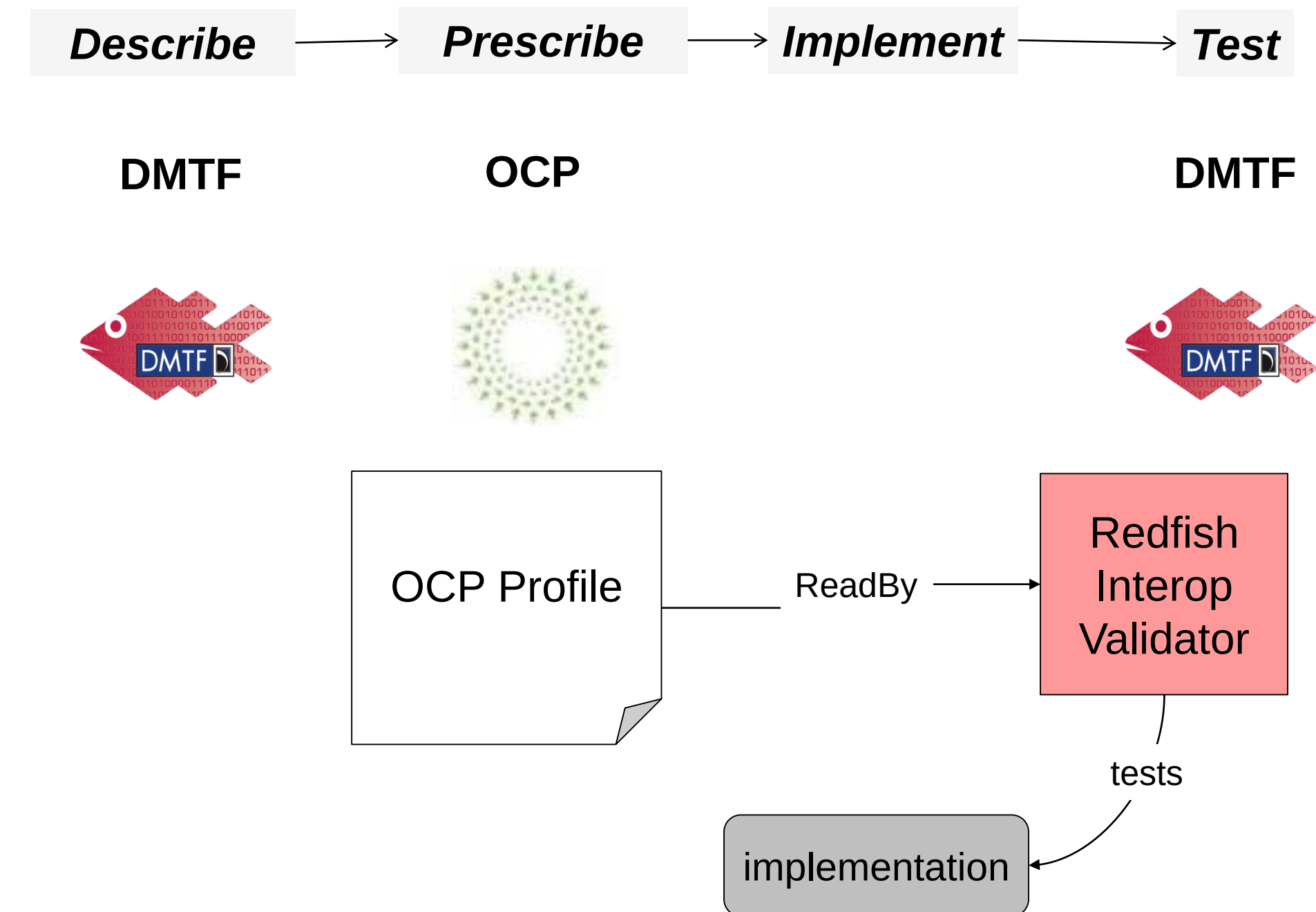
- A JSON formatted Redfish Profile<sup>1</sup>
- Specifies required RESTful interface elements (resources, properties, values)

## Read by the Redfish Interop Validator

- Auto-generates and executes against a conformant implementation (pass/fail)

## Which is part of the OCP Conformance Test Suite<sup>2</sup>

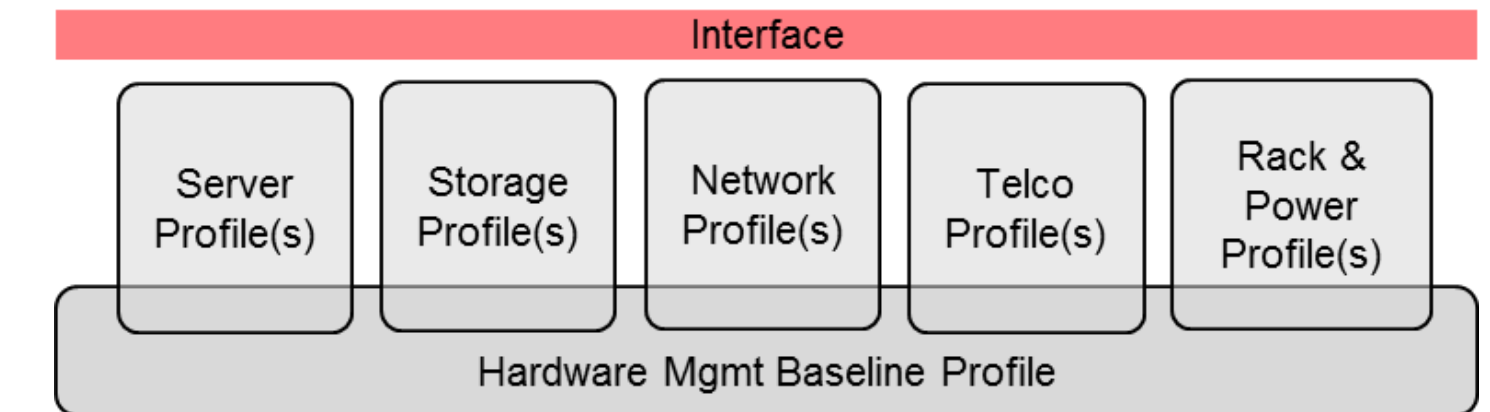
- Redfish Service Validator
- Redfish Service Conformance Check
- Redfish Interop Validator



<sup>1</sup>OCP Summit Session: "Tools and process for creating a Redfish Profile"

<sup>2</sup>[github.com/DMTF](https://github.com/DMTF)

# OCP Profile Status



## Hardware Management Project

- Approved "[OCP Baseline Hardware Management Profile](#)" v1.0.0

## Server Project1

- Reviewing the "[OCP Server Hardware Management Profile](#)" v0.2.0

## OpenRMC (rack manager) sub-project<sup>1</sup>

- Will create profile for Redfish-based northbound interface

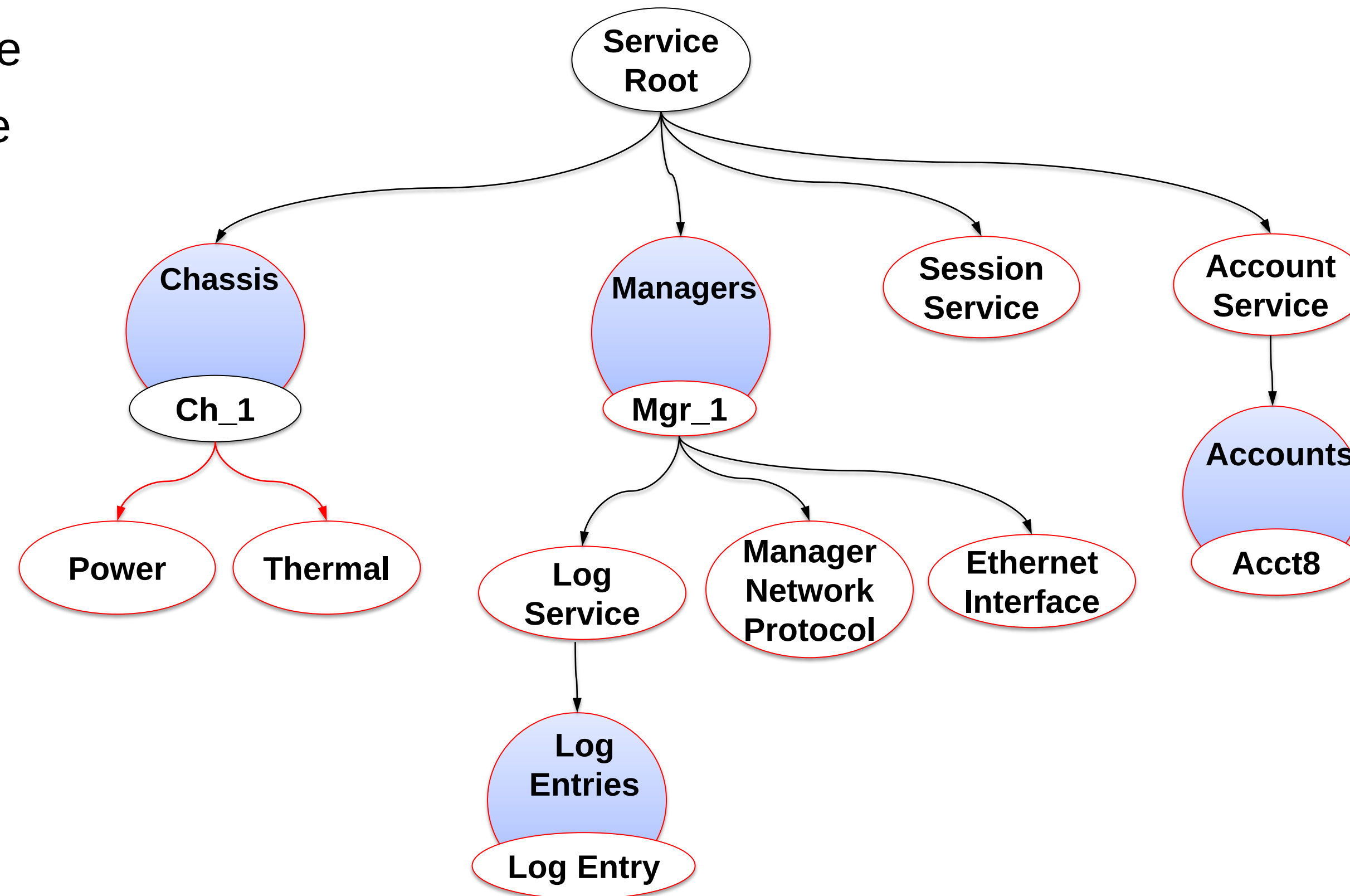
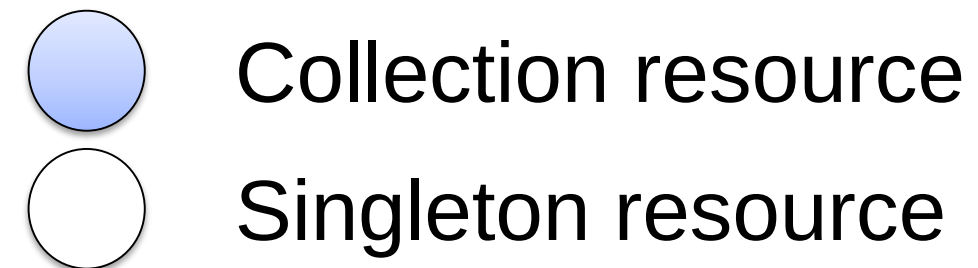
## Other Projects

- Some interest expressed in creating platform specific extensions profiles
- But no profiles have been proposed<sup>2</sup>

<sup>1</sup>OCP Summit Session: "OCP Open Rack Manager Controller subproject"

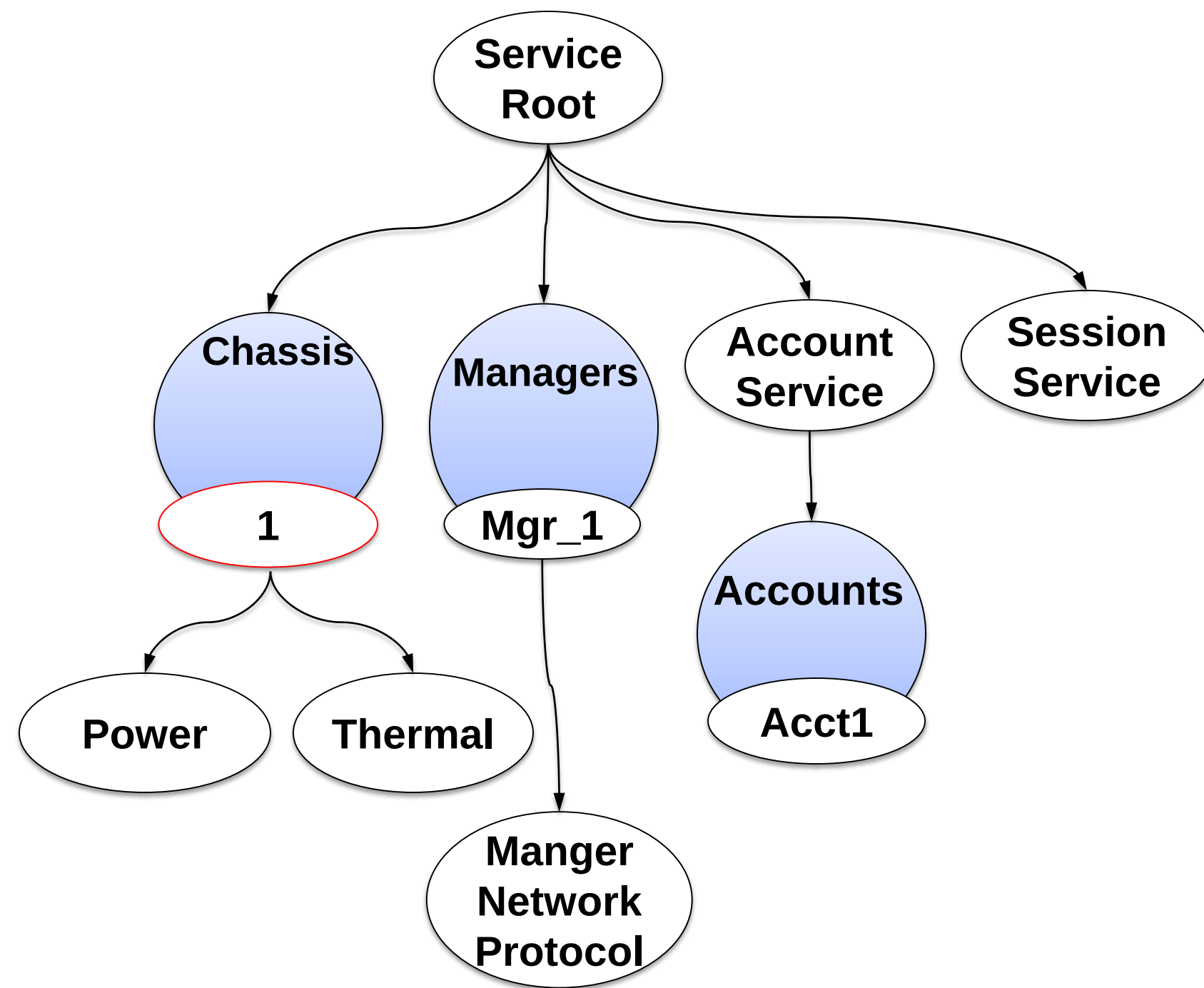
<sup>2</sup>[github.com/opencomputeproject/ocp-profiles](https://github.com/opencomputeproject/ocp-profiles)

# "OCP Baseline Hardware Management Profile"



[http://www.opencompute.org/wiki/Hardware\\_Management/SpecsAndDesigns#Baseline\\_and\\_Server\\_profile](http://www.opencompute.org/wiki/Hardware_Management/SpecsAndDesigns#Baseline_and_Server_profile)

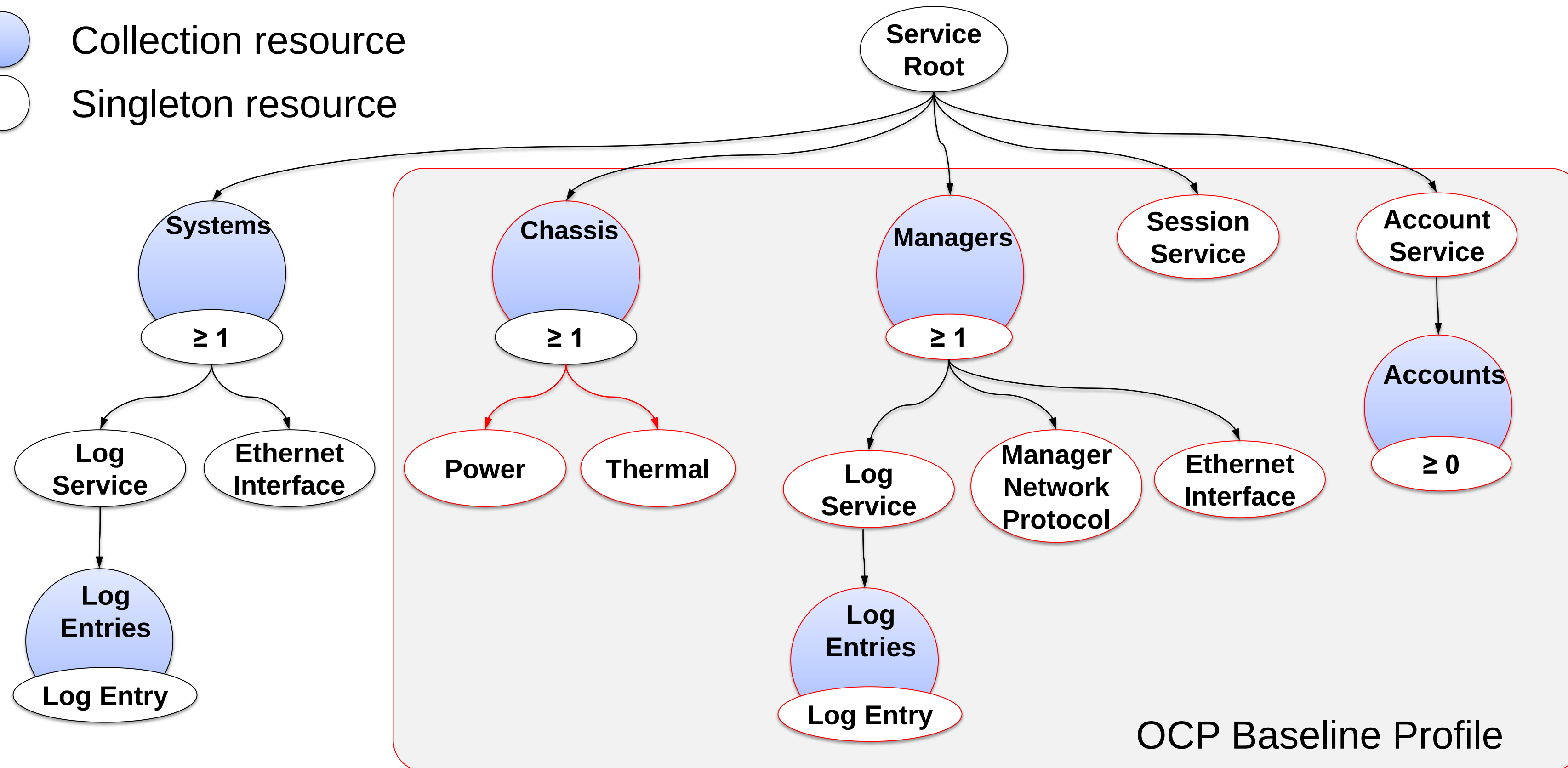
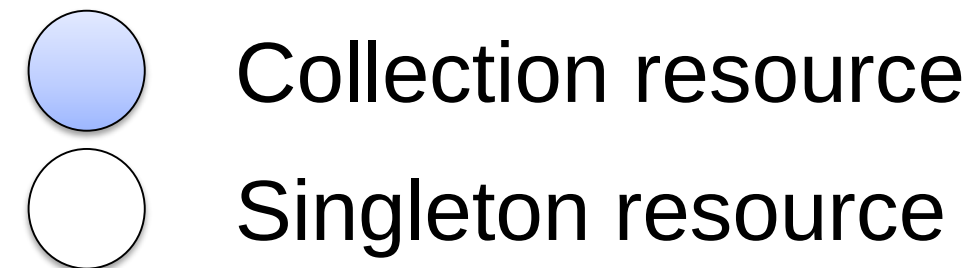
# Chassis Resource



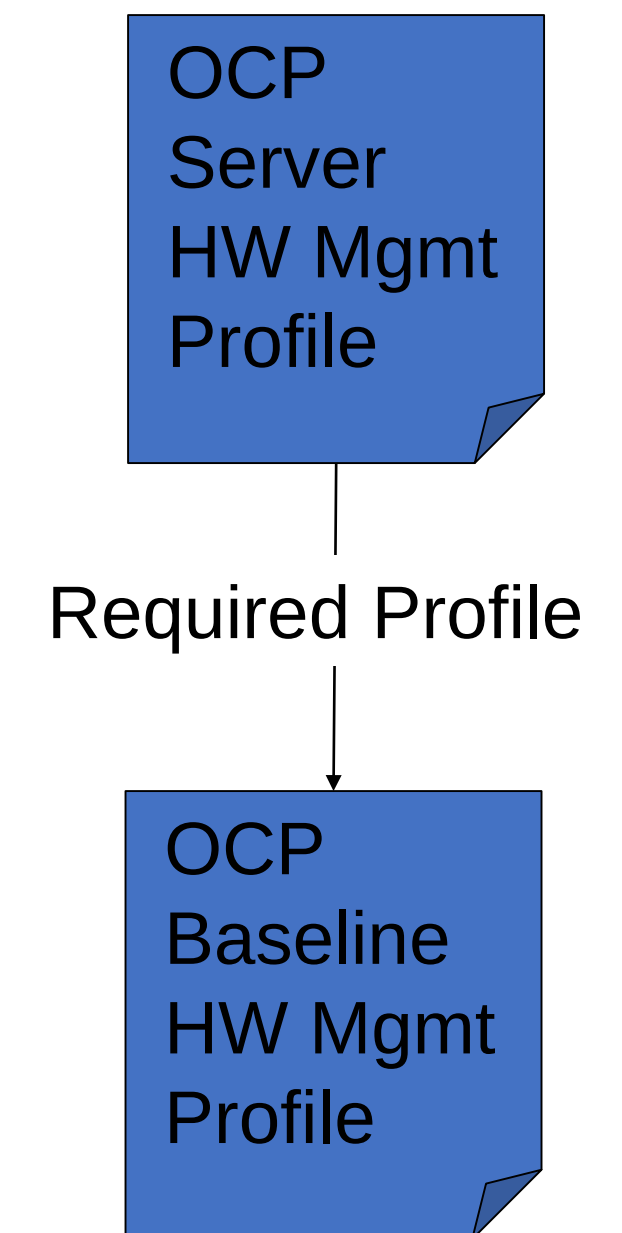
## Chassis (singleton)

```
{
  "@odata.id": "/redfish/v1/Chassis/1",
  "Id": "1",
  "Name": "Computer System Chassis",
  "ChassisType": "RackMount",
  "Manufacturer": "Manufacturer Name",
  "Model": "Product Model Name",
  "SKU": "",
  "SerialNumber": "2M220100SL",
  "PartNumber": "394048H",
  "AssetTag": "Customer Writable String",
  "IndicatorLED": "Lit",
  "PowerState": "On",
  "Status": {
    "State": "...",
    "Health": "..."
  },
  "Power": { ... },
  "Thermal": { ... },
  "Links": {
    "ComputerSystem": [ { "..."} ],
    "ManagedBy": [ { "..."} ],
  },
  "@odata.context": "/redfish/v1/$metadata#Chassis.Chassis",
  "@odata.type": "#Chassis.v1_4_0.Chassis",
}
```

# "OCP Server Hardware Management Profile"



The server profile references the baseline profile<sup>1</sup>



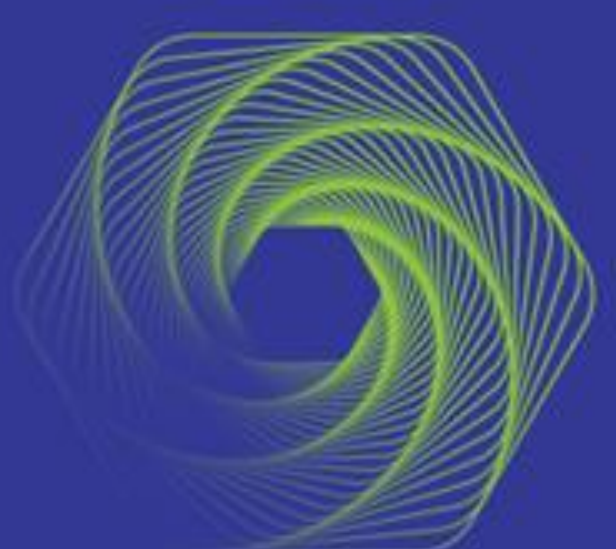
[http://www.opencompute.org/wiki/Hardware\\_Management/SpecsAndDesigns#Baseline\\_and\\_Server\\_profile](http://www.opencompute.org/wiki/Hardware_Management/SpecsAndDesigns#Baseline_and_Server_profile)

# Call to Action

- Test conformance to the Baseline Hardware Management Profile<sup>1</sup>
- Approve the Server Profile<sup>2</sup>
- Propose platform-specific profiles in other OCP projects
- In designs, specify Redfish and required profile

<sup>1</sup><https://www.opencompute.org/projects/hardware-management>

<sup>2</sup><https://www.opencompute.org/projects/server>



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OCP Global Summit | March 14–15, 2019

