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OCP Profiles for Hardware Management

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DMTF's Redfish

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

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

Output: 1A87CA442K

redfishforum.com or redfish.dmtf.org
A Resource URI and a JSON response

HTTP GET /redfish/v1/Systems/CS_1/Processors/2

Simple properties

Complex properties

Subordinate resources

Associated resources

Actions
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, NVMExpress**)
- 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**)

![Diagram of Redfish extensions and standards](image)
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
- 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
- Redfish Service Validator
- Redfish Service Conformance Check
- Redfish Interop Validator

1OCP Summit Session: "Tools and process for creating a Redfish Profile"
2github.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-project¹
• Will create profile for Redfish-based northbound interface

Other Projects
• Some interest expressed in creating platform specific extensions profiles
• But no profiles have been proposed²

¹OCP Summit Session: "OCP Open Rack Manager Controller subproject"
²github.com/opencomputeproject/ocp-profiles
"OCP Baseline Hardware Management Profile"

Collection resource
Singleton resource

http://www.opencompute.org/wiki/Hardware_Management/S 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.

Collection resource
Singleton resource

OCP Server HW Mgmt Profile
Required Profile

OCP Baseline HW Mgmt Profile

http://www.opencompute.org/wiki/Hardware_Management/SpecsAndDesigns#Baseline_and_Server_profile
Call to Action

• Test conformance to the Baseline Hardware Management Profile\(^1\)
• Approve the Server Profile\(^2\)
• Propose platform-specific profiles in other OCP projects
• In designs, specify Redfish and required profile

\(^1\)https://www.opencompute.org/projects/hardware-management
\(^2\)https://www.opencompute.org/projects/server
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OCP Global Summit | March 14–15, 2019