



OCP
SUMMIT

March 20-21
2018
San Jose, CA

OPEN. FOR BUSINESS.



OCP: OCP Profile for Server Platforms

Mar 2018

John Leung – OCP IC Liaison for the HW Management Project
Principal Engineer at Intel Corporation's Data Center Group

OPEN. FOR BUSINESS.



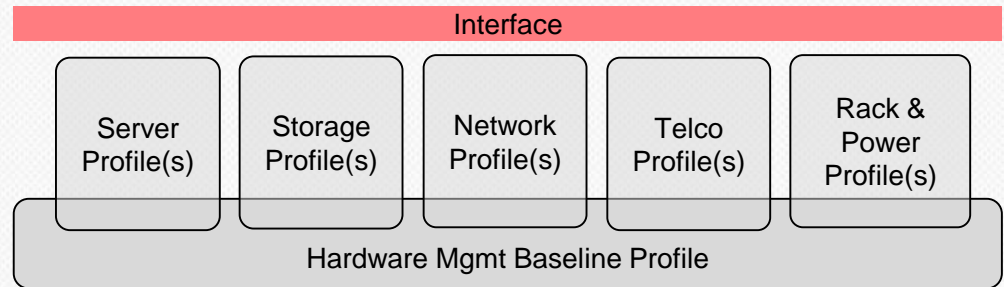
OCP's Profile Approach

The Hardware Management Project shall specify a 'baseline' set of hardware management requirements (aka OCP profile)

- That defines a common set of manageability across OCP platforms
- That can be extended by other OCP projects to include platform specific requirements (a per project decision)

The profile may include requirements for

- The manageability interface
- Other platform elements



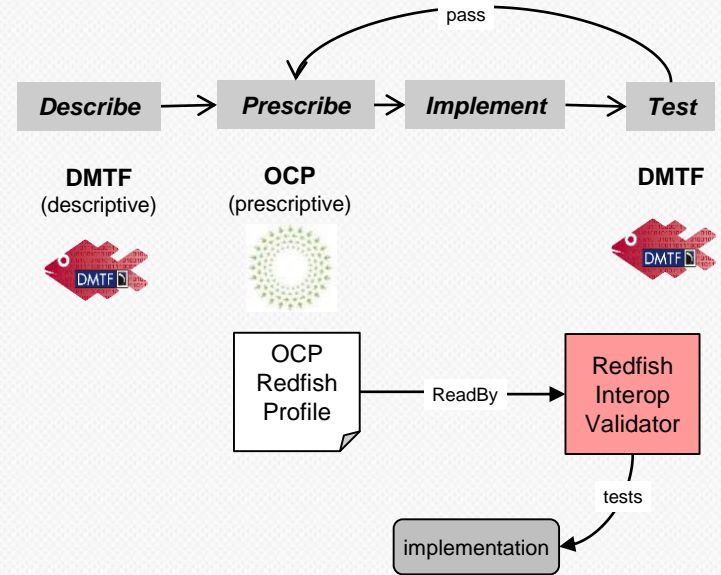
Redfish Interface and Profiles¹

Redfish is a RESTful interface for remote management of a platform

- Interface definition (HTTP, JSON, schema formats)
- Models for managed resources (compute, storage, network and DC facility devices)

Redfish profile (JSON file)

- Specifies required model elements (objects and properties)
- The file is read by DMTF's Redfish Interop Validator² which tests conformance

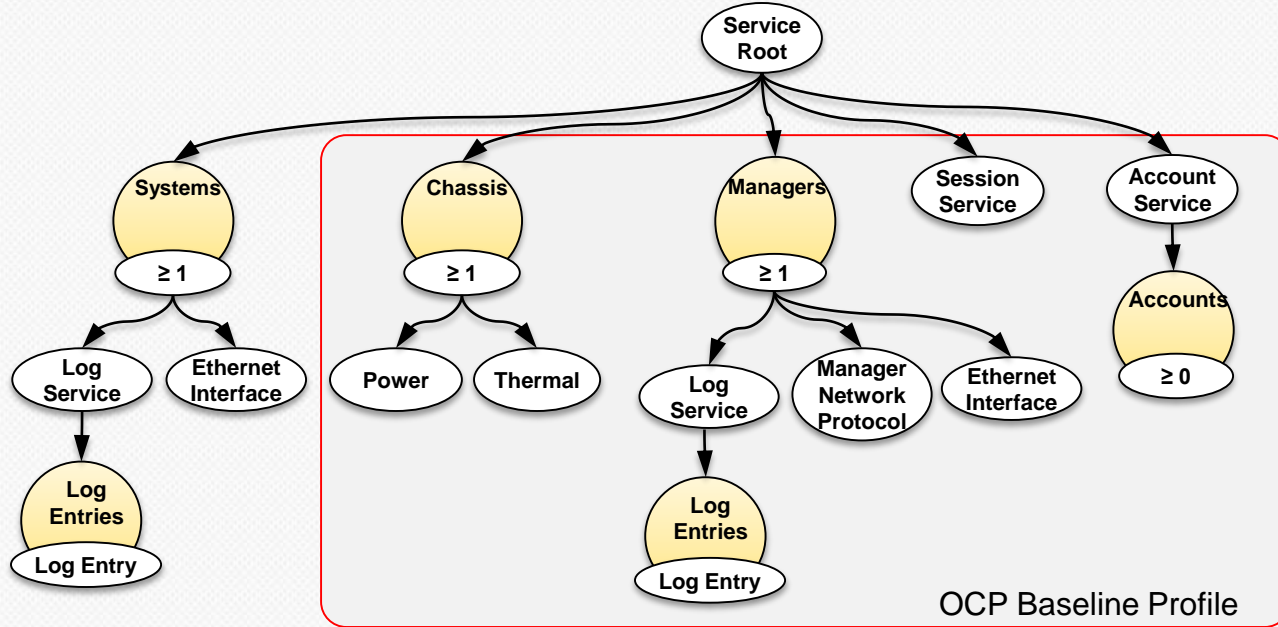


¹"Redfish API and Interoperability Profiles" - Jeff Autor

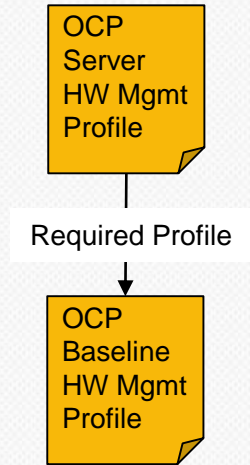
²github.com/DMTF



"OCP Baseline Hardware Management (Redfish Profile)"



The Redfish profile has semantics for expressing extensions



OCP Redfish Profile file

File contains requirements for

- Reference profiles
- Protocols supported
- Schema support
 - Create, delete, etc.
- Property
 - Read-only, read/write
 - Conditional
 - MinCount
 - Value
 - Action

```
"ComputerSystem": {
  "MinVersion": "1.0.0",
  "PropertyRequirements": {
    "AssetTag": {
      "WriteRequirement": "Mandatory"
    },
    "SystemType": {},
    "SerialNumber": {},
    "Manufacturer": {},
    "Model": {},
    "SKU": {
      "ReadRequirement": "Recommended",
      "ConditionalRequirements": [ {
        "Purpose": "Either PartNumber or SKU (or both) must be implemented.",
        "CompareProperty": "PartNumber",
        "Comparison": "Absent",
        "ReadRequirement": "Mandatory"
      } ]
    },
    "PartNumber": {
      "ReadRequirement": "Recommended",
      "ConditionalRequirements": [ {
        "Purpose": "Either PartNumber or SKU (or both) must be implemented.",
        "CompareProperty": "SKU",
        "Comparison": "Absent",
        "ReadRequirement": "Mandatory"
      } ]
    }
  },
  ...
}
```



OCP Redfish Profile Specification

ServiceRoot

```
{
  "@odata.id": "/redfish/v1/",
  "Id": "RootService",
  "Name": "Root Service",
  "Product": "Contoso WidgetDeluxe 8744",
  "RedfishVersion": "1.0.0",
  "UUID": "92384634-2938-2342-8820-489239905423",
  "Chassis": { ... },
  "Managers": { ... },
  "SessionService": { ... },
  "AccountService": { ... },
  "Systems": { ... },
  "Fabrics": { ... },
  "Tasks": { ... },
  "EventService": { ... },
  "UpdateService": { ... },
  "CompositionService": { ... },
  "Registries": { ... },
  "JsonSchemas": { ... },
  "Links": {
    "Sessions": { ... }
  },
  "@odata.context": "/redfish/v1/$metadata#ServiceRoot.ServiceRoot",
  "@odata.type": "#ServiceRoot.v1_3_0.ServiceRoot",
}
```

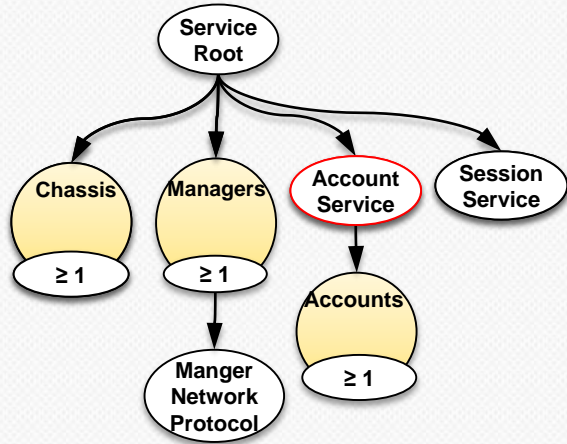
Property	Requirement	Value
UUID	Mandatory	
RedfishVersion	Mandatory	
AccountService	Mandatory	
SessionService	Mandatory	
Chassis	Mandatory	
Managers	Mandatory	

Property	Requirement	Value
Fans	If Implemented	
Status	Mandatory	
Name	Recommended, Read only	
Reading	Recommended, Read only	
ReadingUnit	Recommended, Read only	

Property	Requirement	Value
Action	Mandatory	
#Manager.Reset	Mandatory	
#Manager.Reset/ResetType@AllowableValues	Mandatory	ForceRestart



Account Service

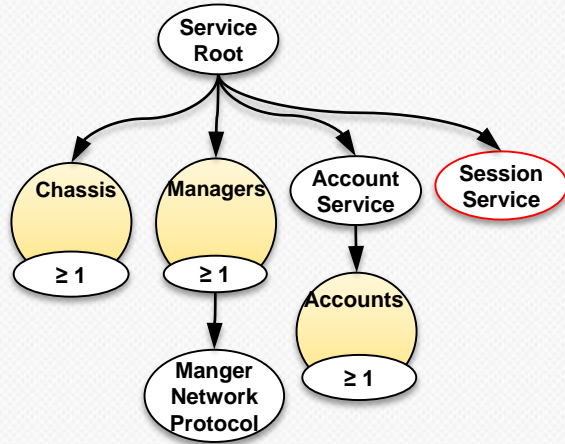


AccountService

```
{
  "@odata.id": "/redfish/v1/AccountService",
  "Id": "AccountService",
  "Name": "Account Service",
  "Description": "Account Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "AuthFailureLoggingThreshold": 3,
  "MinPasswordLength": 8,
  "AccountLockoutThreshold": 5,
  "AccountLockoutDuration": 30,
  "AccountLockoutCounterResetAfter": 30,
  "Accounts": {
    "@odata.id": "/redfish/v1/AccountService/Accounts"
  },
  "Roles": {
    "@odata.id": "/redfish/v1/AccountService/Roles"
  },
  "@odata.type": "#AccountService.v1_0_0.AccountService",
  "@odata.context": "/redfish/v1/$metadata#AccountService.AccountService",
}
```



Session Service



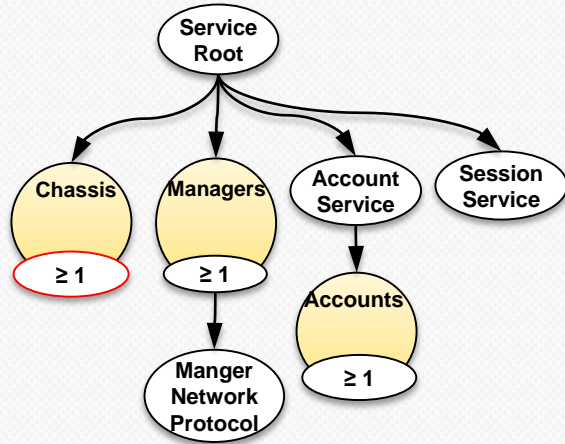
SessionService

```
{
  "@odata.id": "/redfish/v1/SessionService",
  "Id": "SessionService",
  "Name": "Session Service",
  "Description": "Session Service",
  "Status": {
    "State": "Enabled",
    "Health": "OK"
  },
  "ServiceEnabled": true,
  "SessionTimeout": 30,
  "Sessions": {
    "@odata.id": "/redfish/v1/SessionService/Sessions"
  },
  "@odata.type": "#SessionService.v1_0_0.SessionService",
  "@odata.context": "/redfish/v1/$metadata#SessionService.SessionService",
}
```

No requirements on properties within the SessionService resource



Chassis Resource

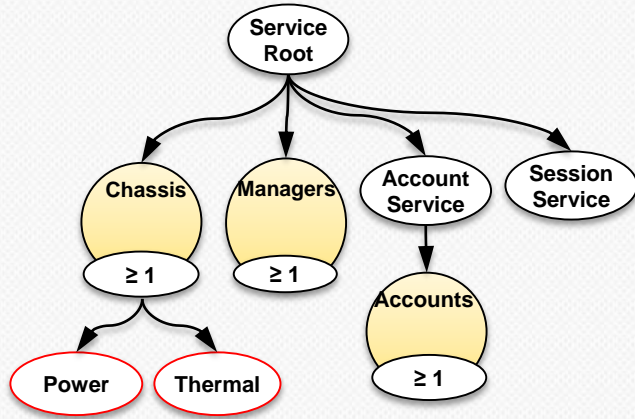


Chassis (singleton)

```
{
  "@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",
}
```



Power and Thermal Resource



Power

```
{
  "@odata.id": "/redfish/v1/Chassis/1/Power",
  "Id": "Power",
  "PowerControl": [
    {
      "@odata.id": "/redfish/v1/Chassis/1/Power#/PowerControl/0",
      "MemberId": "0",
      "Name": "System Power Control",
      "PhysicalContext": "Chassis",
      "PowerConsumedWatts": 8000,
      "PowerRequestedWatts": 8500,
      "PowerAvailableWatts": 8500,
      "PowerCapacityWatts": 10000,
      "PowerAllocatedWatts": 8500,
      "PowerMetrics": {
        "IntervalInMin": 30,
        "MinConsumedWatts": 7500,
        "MaxConsumedWatts": 8200,
        "AverageConsumedWatts": 8000
      },
      "PowerLimit": {
        "LimitInWatts": 9000,
        "LimitException": "LogEventOnly",
        "CorrectionInMs": 42
      },
      "RelatedItem": [
        { "@odata.id": "/redfish/v1/Chassis/1" }
      ],
      "Status": { "State": "Enabled" "Health": "OK" },
      "Voltages": [ { ... } ],
      "PowerSupplies": [ { ... } ],
      "Redundancy": [ { ... } ],
    }
  ]
}
```



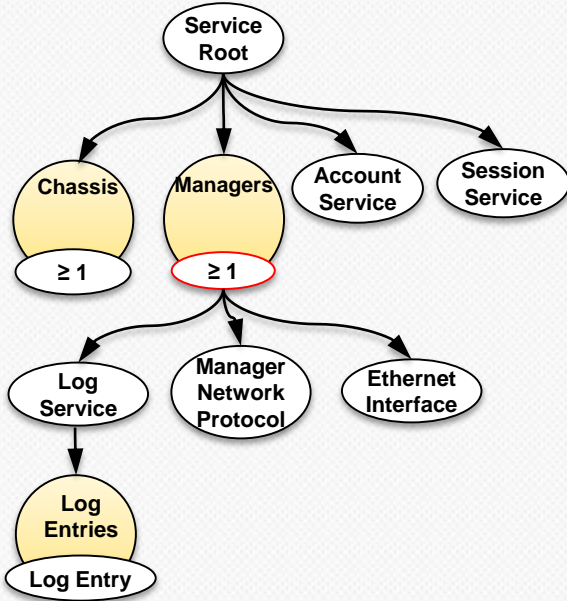
Thermal

```
{
  "@odata.id": "/redfish/v1/Chassis/1/Thermal",
  "Id": "Thermal",
  "Fans": [
    {
      "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Fans/0",
      "MemberId": "0",
      "Name": "BaseBoard System Fan",
      "PhysicalContext": "Backplane",
      "Status": { "State": "Enabled", "Health": "OK" },
      "Reading": 2100,
      "ReadingUnits": "RPM",
      "IndicatorLED": "Off",
      "Model": "694843-Z91",
      "Manufacturer": "Contoso FanCo",
      "SerialNumber": "2016334576",
      "PartNumber": "1z0000001A3a",
      "SparePartNumber": "0000001A3a",
      "UpperThresholdNonCritical": 42,
      "UpperThresholdCritical": 4200,
      "UpperThresholdFatal": 42,
      "LowerThresholdNonCritical": 42,
      "LowerThresholdCritical": 5,
      "LowerThresholdFatal": 42,
      "MinReadingRange": 0,
      "MaxReadingRange": 5000,
      "Redundancy": [
        { "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Redundancy/0" }
      ],
      "RelatedItem": [
        { "@odata.id": "/redfish/v1/Chassis/1" }
      ]
    }
  ],
},
```

Thermal (continue)

```
...
  "Redundancy": [
    {
      "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Redundancy/0",
      "MemberId": "0",
      "Name": "BaseBoard System Fans",
      "RedundancyEnabled": false,
      "RedundancySet": [
        { "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Fans/0" },
        { "@odata.id": "/redfish/v1/Chassis/1/Thermal#/Fans/1" }
      ],
      "Mode": "N+m",
      "Status": { "State": "Disabled", "Health": "OK" },
      "MinNumNeeded": 1,
      "MaxNumSupported": 2
    }
  ],
  "Temperatures": [ { . . . } ]
}
```

Manager Resource

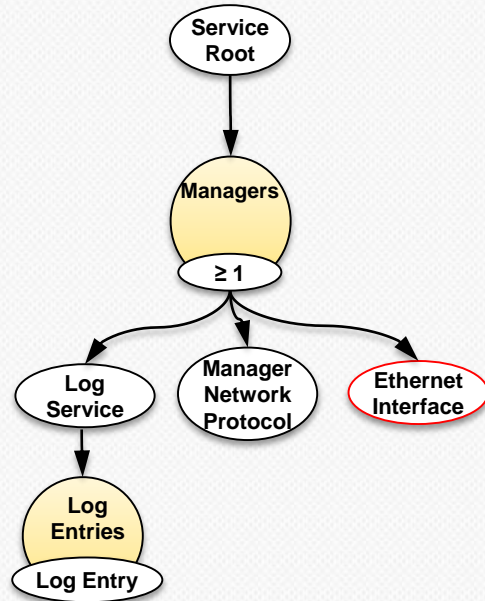


Manager

```
{
  "@odata.id": "/redfish/v1/Managers/1",
  "Id": "1",
  "Name": "Manager",
  "ManagerType": "BMC",
  "Description": "BMC",
  "ServiceEntryPointUUID": "92384634-2938-2342-8820-489239905423",
  "UUID": "00000000-0000-0000-0000-000000000000",
  "Model": "Joo Janta 200",
  "DateTime": "2015-03-13T04:14:33+06:00",
  "DateTimeLocalOffset": "+06:00",
  "Status": { "State": "Enabled", "Health": "OK" },
  "GraphicalConsole": { ... },
  "SerialConsole": { ... },
  "CommandShell": { ... },
  "FirmwareVersion": "1.00",
  "NetworkProtocol": { "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol" },
  "EthernetInterfaces": { "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces" },
  "LogServices": { "@odata.id": "/redfish/v1/Managers/1/LogServices" },
  "SerialInterfaces": { "@odata.id": "/redfish/v1/Managers/1/SerialInterfaces" },
  "VirtualMedia": { "@odata.id": "/redfish/v1/Managers/1/VM1" },
  "Links": {
    "ManagerForServers": [ { "@odata.id": "/redfish/v1/Systems/1" } ],
    "ManagerForChassis": [ { "@odata.id": "/redfish/v1/Chassis/1" } ],
    "ManagerInChassis": "@odata.id": "/redfish/v1/Chassis/1"
  },
},
"Actions": {
  "#Manager.Reset": {
    "target": "/redfish/v1/Managers/1/Actions/Manager.Reset",
    "ResetType@Redfish.AllowableValues": [ "ForceRestart", "GracefulRestart" ]
  }
}
}
```



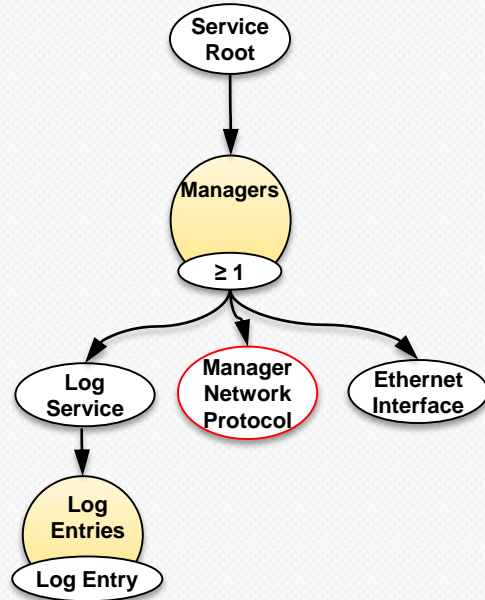
Manager's Ethernet Interface Resource



```
{
  "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/1",
  "Id": "1",
  "Name": "Manager Ethernet Interface",
  "Description": "Management Network Interface",
  "Status": { "State": "Enabled", "Health": "OK" },
  "InterfaceEnabled": true,
  "PermanentMACAddress": "AA:BB:CC:DD:EE:FF",
  "MACAddress": "AA:BB:CC:DD:EE:FF",
  "SpeedMbps": 100,
  "AutoNeg": true,
  "FullDuplex": true,
  "MTUSize": 1500,
  "HostName": "MyHostName",
  "FQDN": "MyHostName.MyDomainName.com",
  "MaxIPv6StaticAddresses": 1,
  "VLAN": { ... },
  "IPv4Addresses": [ { ... } ],
  "IPv6AddressPolicyTable": [ { ... } ],
  "IPv6StaticAddresses": [ { ... } ],
  "IPv6DefaultGateway": "fe80::1ec1:deff:fe6f:1e24",
  "IPv6Addresses": [ { ... } ],
  "NameServers": [ "TheNameServer" ],

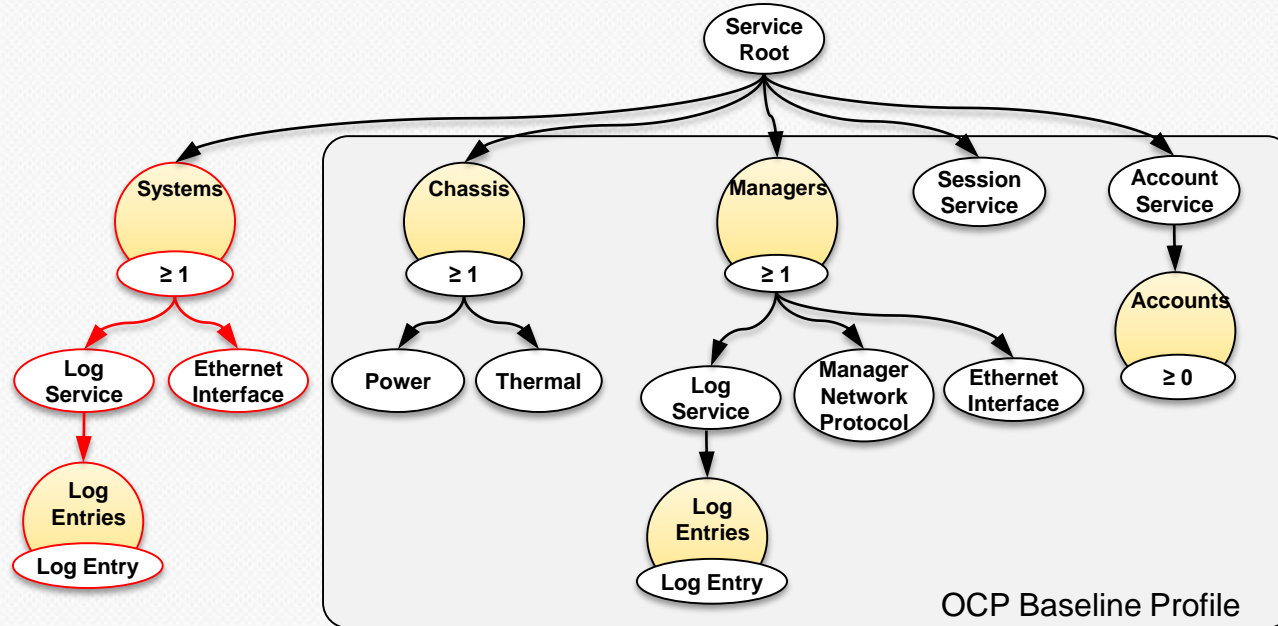
  "@Redfish.Settings": {
    "@odata.type": "#Settings.v1_0_0.Settings",
    "SettingsObject": { "@odata.id": "/redfish/v1/Managers/1/EthernetInterfaces/1/SD" },
    "Time": "2012-03-07T14:44.30-05:00",
    "ETag": "someetag",
    "Messages": [ { ... } ]
  }
}
```

Manager's Network Protocol Resource



```
{  
  "@odata.id": "/redfish/v1/Managers/1/NetworkProtocol",  
  "Id": "NetworkProtocol",  
  "Name": "Manager Network Protocol",  
  "Description": "Manager Network Service Status",  
  "Status": { "Enabled": "true", "Health": "OK" },  
  "HostName": "mymanager",  
  "FQDN": "mymanager.mydomain.com",  
  
  "HTTP": { "ProtocolEnable": "true", "Port": "80" },  
  "HTTPS": { "ProtocolEnable": "true", "Port": "443" },  
  "SSH": { "ProtocolEnable": "true", "Port": "22" },  
  "SSDP": {  
    "ProtocolEnable": "...",  
    "Port": "...",  
    "NotifyMulticastIntervalSeconds": "...",  
    "NotifyIPv6Scope": "...",  
    "NotifyTTL": "...  
  },  
  "IPMI": { ... },  
  "VirtualMedia": { ... },  
  "Telnet": { ... },  
  "KVMIP": { ... },  
  "NTP": { ... }  
}
```

"OCP Server Hardware Management (Redfish Profile)"



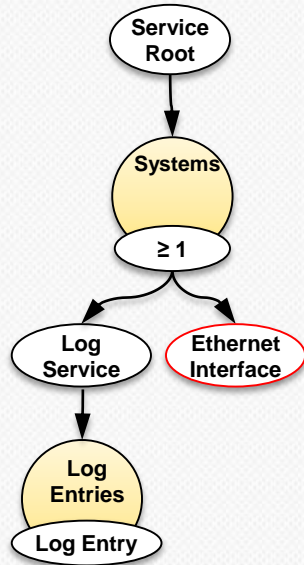
System

```
{
  "@odata.id": "/redfish/v1/Systems/1",
  "Id": "1",
  "Name": "My Computer System",
  "SystemType": "Physical",
  "AssetTag": "free form asset tag",
  "Manufacturer": "Manufacturer Name",
  "Model": "Model Name",
  "SKU": "",
  "SerialNumber": "2M220100SL",
  "PartNumber": "",
  "Description": "Description of server",
  "UUID": "00000000-0000-0000-0000-000000000000",
  "HostName": "web-srv344",
  "Status": { "State": "Enabled", "Health": "OK", "HealthRollup": "OK" },
  "IndicatorLED": "Off",
  "PowerState": "On",
  "Boot": {
    "BootSourceOverrideEnabled": "Once",
    "BootSourceOverrideMode": "UEFI",
    "BootSourceOverrideTarget": "Pxe",
    "BootSourceOverrideTarget@Redfish.AllowableValues": [ . . . ],
    "UefiTargetBootSourceOverride": "uefi device path"
  },
  "BiosVersion": "P79 v1.00 (09/20/2013)",
  "ProcessorSummary": {
    "Count": 8,
    "Model": "Multi-Core Intel(R) Xeon(R) processor 7xxx Series",
    "Status": { "State": "Enabled", "Health": "OK", "HealthRollup": "OK" }
  },
  "MemorySummary": {
    "TotalSystemMemoryGiB": 16,
    "MemoryMirroring": "System",
    "Status": { "State": "Enabled", "Health": "OK", "HealthRollup": "OK" }
  },
}
```

System (continue)

```
. . .
"Processors": { "@odata.id": "/redfish/v1/Systems/1/Processors" },
"Memory": { "@odata.id": "/redfish/v1/Systems/1/Memory" },
"EthernetInterfaces": { "@odata.id": "/redfish/v1/Systems/1/EthernetInterfaces" },
"NetworkInterfaces": { "@odata.id": "/redfish/v1/Systems/1/NetworkInterface" },
"SimpleStorage": { "@odata.id": "/redfish/v1/Systems/1/SimpleStorage" },
"LogServices": { "@odata.id": "/redfish/v1/Systems/1/LogServices" },
"SecureBoot": { "@odata.id": "/redfish/v1/Systems/1/SecureBoot" },
"Bios": { "@odata.id": "/redfish/v1/Systems/1/Bios" },
"TrustedModules": [ { . . . } ],
"PCIeDevices": [ { "@odata.id": "/redfish/v1/Chassis/1/PCIeDevices/NIC" } ],
"PCIeFunctions": [ { . . . } ],
"Links": {
  "Chassis": [ { "@odata.id": "/redfish/v1/Chassis/1" } ],
  "ManagedBy": [ { "@odata.id": "/redfish/v1/Managers/1" } ],
  "Endpoints": [ { "@odata.id": "/redfish/v1/Fabrics/PCIe/Endpoints/HostRootComplex1" } ],
},
"Actions": {
  "#ComputerSystem.Reset": {
    "target": "/redfish/v1/Systems/1/Actions/ComputerSystem.Reset",
    "@Redfish.ActionInfo": "/redfish/v1/Systems/1/ResetActionInfo"
  }
}
}
```

System's Ethernet Interface Resource



EthernetInterface

```
{  
  "$odata.type": "EthernetInterface.v1.1.0.EthernetInterface"  
  "MACAddress": "...",  
  "SpeedMps": "...",  
  "InterfaceEnabled": "...",  
  "LinkStatus": "...",  
  "EthernetInterfaces": "...",  
  "LogServices": "...",  
  "Status": {  
    "State": "...",  
    "Health": "..."  
  },  
  "Hostname": "...",  
  "FQDN": "...",  
  "NameServers": [...]  
}
```



Next Steps (after the Summit)

OCP's Redfish Profile specifications

- "OCP Baseline HW Management v0.2.0 (Redfish Profile)"
- "OCP Server Hardware Management v0.2.0 (Redfish Profile)"

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

http://www.opencompute.org/wiki/Server/Working#Active_documents

Redfish Profiles

- "Redfish Profile Specification v0.99b" (DSP0272, work-in-progress)
https://www.dmtf.org/sites/default/files/standards/documents/DSP0272_0.99.0a.pdf
- "Redfish Profile Bundle v0.95a" (DSP-IS0003, work-in-progress)
https://www.dmtf.org/sites/default/files/standards/documents/DSP-IS0003_0.95a.zip
(includes proposed Profile files for OCP Baseline HW Mgmt and OCP Server HW Mgmt)



Next Steps (at the OCP Summit)

Attend the OpenBMC track

Visit DMTF's Redfish Booth - exhibit #C4

Visit various Redfish demo's in the Exhibition Hall





OCP SUMMIT

Thank you!