RAFPA – Redfish Agent For Power API

SC17 BOF: PowerAPI, GEOPM and Redfish
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Agenda

• Business Context
  • What is Redfish
  • Who is behind Redfish.
  • Redfish Resource Mapping
• RAFPA
  • Introduction
  • Architecture
  • Key Features
  • Future Plan
  • Demo
Redfish
What is Redfish?

• **Industry Standard RESTful API for IT Infrastructure**
  - HTTPS in JSON format based on Odata v4
  - Equally usable by Apps, GUIs and Scripts
  - Schema-backed but human-readable

• **Version 1 focused on Servers**
  - A secure, multi-node capable replacement for IPMI-over-LAN
  - Add devices over time to cover customer use cases & technology
    - PCIe Switching, Local Storage, NVDIMMs, Multifunction Adapters, Composability
  - Intended to meet OCP Remote Machine Management requirements

• **Expand scope over time to rest of IT infrastructure**
  - Working with SNIA to cover more advanced storage.
  - Plan on working with partners like the Green Grid to cover Power/Cooling.
  - Goal is to accommodate or map existing switch standards over time.

[www.dmtf.org](http://www.dmtf.org)
Scalable Platforms Management Forum (DMTF Group that Defines Redfish)

Co-Chairs: Jeff Autor (HPE), Paul Vancil (Dell)

Leadership Companies

Supporting Companies
AMI, Cisco, Fujitsu, Western Digital, Huawei, IBM, Insysde Software, Mellanox, NetApp, Oracle, Microsemi, Qualcomm, Seagate

Industry Alliance Partners
- OpenCompute Project
- UEFI - Collaborating on Firmware Update and Host Interface work
- SNIA – Collaborating on Storage modeling/alignment between SSM and Redfish
- TGG – Pursuing relationship to work on Power/Cooling (existing DMTF Alliance Partner)

www.dmtf.org
Enabling Redfish Support for PowerAPI
RAFPA – Redfish Agent for Power API

Power API Core Features

- System Description XML Config
- Device Plugins
- Daemon XML RPC

Device Plugins

- PowerInsight
- RAFPA
- XTPM
- WattsUp
- RAPL
- PowerGadget
RAFPA - Present and Future

Power API

RAFPA

Redfish
Key Features of RAFPA

**Easy Installation**
- Automatically resolve all the prerequisites
- Single command installation.

**Open Source**
- Use of all open source Libraries

**Monitoring**
- Power, Temperature, CPU states, Voltage, Frequency

**Power Control**
- Configure CPU Power and Performance States
- Power capping and Reset option

**Easy Configuration**
- Add a new attribute with minimal effort
- Readable Configuration files (yaml)

**In Band and Remote Communication Support**
- Daemon Architecture for handling multiple nodes over management network
- In Band for network less communication

**Vendor Neutral**
- Support for any new redfish compliant server
Power API Attributes Coverage – Monitoring and Control
Communication Channels

In Band (Only HPE Servers)

- **Management Node**
  - **PowerAPI Daemon**

- **pwrapi node**
  - **Redfish Agent**
    - **iloREST-chif-so**
      - **Kernel**
        - **ILO Management Controller**
Communication Channels
Remote (Out Of Band)

Management Node
- PowerAPI Daemon
- pwrapi node
- RAFPA Agent

ILO network
Scalability – Monitoring with 1400 Endpoints
PowerAPI with RAFPA - Key Benefits

**Leverage**
- Easily Leverage Power measurement and Control capabilities of hardware and extract maximum benefits

**Help developers**
- Help developers to add power and energy efficiency to their optimization criteria

**Energy aware scheduling**
- Opportunities exist for Energy aware scheduling

**Flexibility**
- More flexible with External Power Suppliers and Cooling Systems
Power Monitor and Control – Demo Setup

- Platform
  - Cabinet
    - Chassis1
      - Node 1
      - …
      - BL460
    - Node 11
    - SL230
  - Chassis2
    - Node 1
    - …
  - Chassis3
    - Node 1
    - …
    - SL250
    - Node 4
root@router:~/DaemonTesting/router/daemon#
Current Status & Next Steps

- RAFPA Code submissions into PowerAPI GitHub
  - OSRB approval obtained
  - Presentation & demo to Sandia Labs completed
  - Code submission into PowerAPI GitHub repository completed

- Explore feasibility on non-ILO Redfish compliant systems (Supermicro & next-gen Exascale platforms)
Thank You