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Redfish for Data Center Facilities

NOVEMBER 9-10, 2021

DCF

Redfish for Data Center Facilities

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Why Redfish for the DCF Project?

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- Established standard management protocol and data model
  - Widely supported in IT gear (BMCs, servers, storage systems)
  - Becoming a requirement for OCP designs via HW Mgmt Project
  - Redfish Developer Hub: http://redfish.dmtf.org
- Redfish defines common “Housekeeping” management functions
  - User Accounts, event logging, firmware update process
  - Event/alarm subscription/delivery methods and syntax
  - Standard message syntax and message definitions
  - Device discovery (SSDP) and modern security infrastructure (SSL)
- A common data model for power and thermal management enables DCF software to work across vendors and integrate with IT gear

Redfish for Facilities

DATA CENTER FACILITIES

- First DCF support released in 2019:
  - Included PDU, Facility, Power Domain models
  - Introduced Sensor model
- Releases in 2021 have added more support:
  - Power Shelf products, Electrical Busses, electrical connectivity
  - Introduced Control model built on the Sensor model
- Work in Progress within the DMTF Redfish Forum:
  - UPS / Backup Power systems
  - Cooling Distribution Units
  - Liquid cooled servers (internal systems)

Work In Progress

DATA CENTER FACILITIES

- The information in this presentation represents a snapshot of work in progress within the DMTF.
- This information is subject to change without notice. The standard specifications remain the normative reference for all information.
- For additional information, see the DMTF website: www.dmtf.org

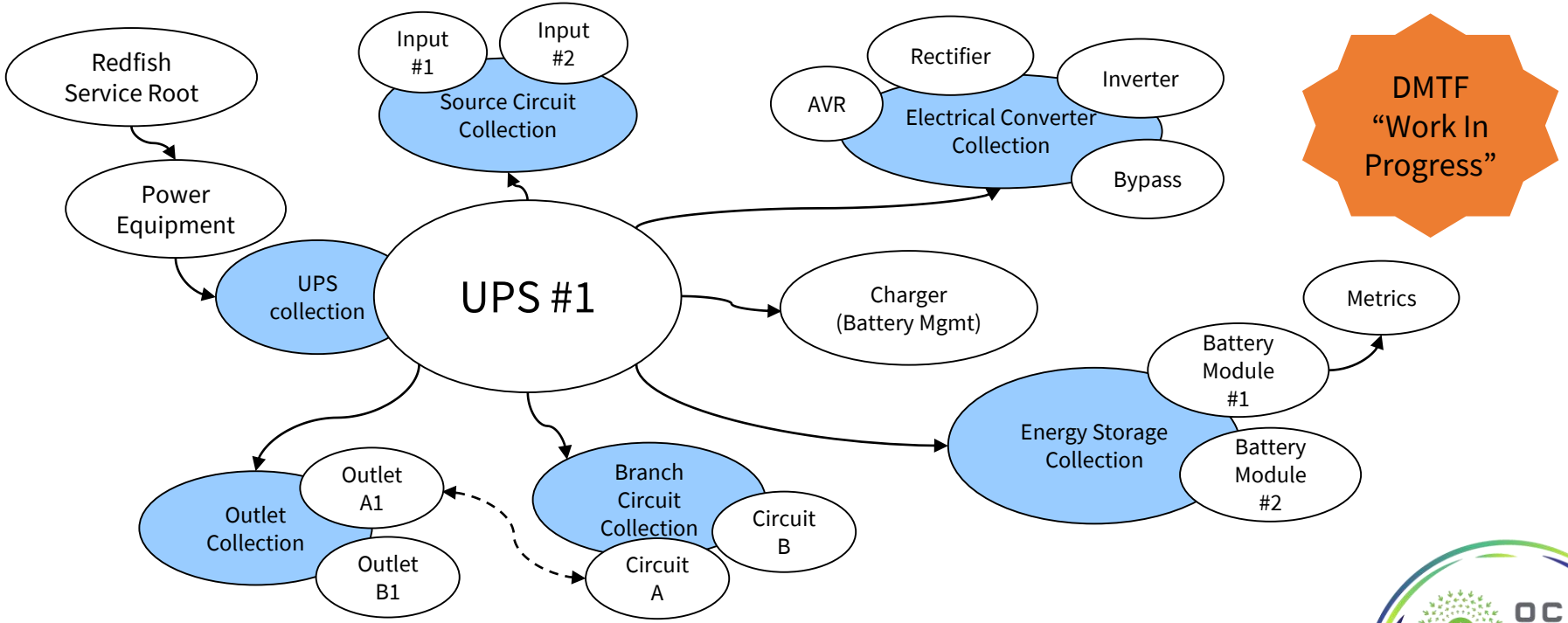
Expected UPS Support

DATA CENTER FACILITIES

- Leverage existing PDU model for circuits, outlets, basic inventory
- Add energy storage subsystem
  - Support simple or complex battery subsystems
  - Support alternative storage methods such as flywheels
  - Provide consistent monitor / control regardless of technology
- Add charger subsystem
  - Support charging from utility power or from alternative sources
- Define standard Redfish messages for common UPS “alarms”
  - Create a Redfish Message Registry for Power-related items
  - Ensure support covers 100% of common SNMP traps

DMTF “Work In Progress”

Redfish UPS model (proposed)



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Cooling Distribution

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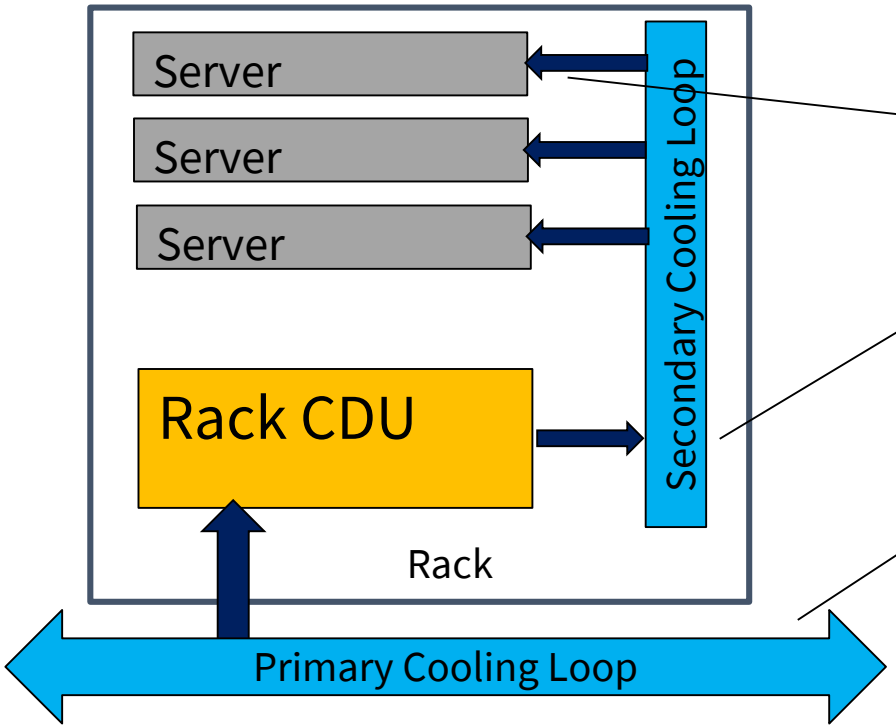
- First use case is rack-based Cooling Distribution Units
  - May contain active cooling or more passive heat exchangers
  - Support multiple form factors: Rack-based, door-based, etc.
- Add models for Cooling loops (primary and secondary)
  - “Interface” resource provides monitoring and control point
  - Follow pattern from Circuit and Outlet to show connectivity
  - Support both local (in-rack) and facility-level cooling loops
- Add models for Pumps, Leak detection systems

Cooling Loop and Interface model

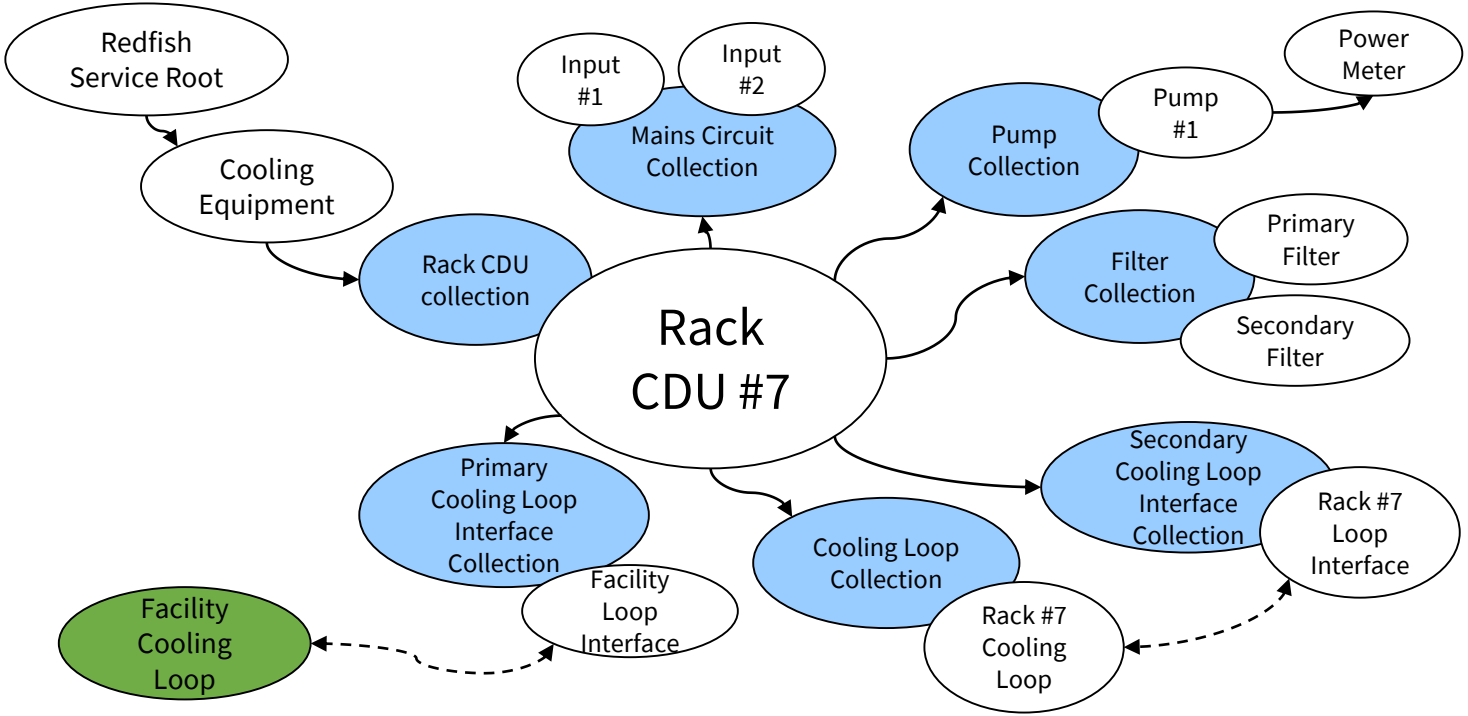


Each Server's **LoopInterface** links to the external **CoolingLoop** (in the RackCDU)

RackCDU *secondary* **LoopInterface** connects to a **CoolingLoop** instance

RackCDU *primary* **LoopInterface** links to a **CoolingLoop** instance in the **Facility**

Redfish CDU model (proposed)



DMTF "Work In Progress"

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External | Collection | Singleton

Mockup demonstration

DATA CENTER FACILITIES

- Using Mockup Explorer portion of the Redfish Developer Hub
- https://redfish.dmtf.org/redfish/mockups/v1

Call to Action

- Join efforts within DCF workstreams to complete Redfish models
- Provide feedback on work-in-progress data models for UPS and CDU systems
- Redfish Standards page - download specifications and schemas
  - http://www.dmtf.org/standards/redfish
- Redfish Developer Hub – educational material, mockup explorer
  - http://redfish.dmtf.org
- Redfish User Forum – open discussion forum
  - http://www.redfishforum.com

Open Discussion