OPEN Compute Project

OCP- Data Center Facilities
DC Automation Charter
Revision 1.0

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Overview

The Open Compute Program (OCP) - Data Center Facilities (DCF) DC Automation Sub-Project was formed to promote, support and guide development of physical automation solutions related to the data center industry. We are aiming the utilization of automation technologies to boost the physical operation efficiency and safety in the data centers and supporting infrastructure. This sub-project will provide direction with respect to known industry challenges and engage industry partners to develop relevant technology roadmaps aiming to achieve safer and more efficient operations. OCPs unique combination of hyperscale influence, vendors and projects can be leveraged to accelerate the industry's automation goals.

Goals

1) Help industry players understand the inefficiencies and safety exposures in the data center life cycle, including construction, operation, and retrofit phases
2) Advance data center automation technology development and integration, bridge the gap between data center providers and technology providers to support product development in the following areas
    a) Data center operations (Workstream 1, 2, 3 and 4)
        i) Workstream 1 - Material movement automation (e.g. rack moves)
        ii) Workstream 2 - Remote monitoring automation
        iii) Workstream 3 - Media management automation (e.g. parts harvesting and circularity, sanitization)
        iv) Workstream 4 - Manipulation & repair automation
    b) Data center maintenance
        i) Critical facility/equipments remote monitoring automation
        ii) Critical equipment preventive maintenance automation
    c) Data center construction
        i) Construction automation and monitoring technologies
        ii) Retrofit automation and monitoring technologies
3) Promote industry collaborations in the automation technology innovation
    a) Establish industry best practices shared between vendors/suppliers
    b) Enabling new technologies via collaboration
4) Develop automation standards and guidelines, including operation standard, safety standard, security standard, ergonomics and HMI standard etc. Define automation touch points for components like hard drives and DIMMs
5) Enable designers to design automation friendly facilities to prepare for future highly automated data center systems

In-Scope Activities

- Data center automation technologies that will aid in meeting the DC Automation goals, and cross data center facilities and supporting infrastructures (hyperscale data center, colocation facility, edge facility, signal boosting station, submarine cable, etc.)
- Industry sharing/alignment on use cases, requirements, and specifications
- Provide guidelines on standards allowing easy utilization of automation technology to the data center facilities
- Testing support and knowledge sharing
- Examples of Technologies: autonomous mobile robots (AMRs), automated guided vehicles (AGVs), manipulation (robot arms and grippers), batteries, charging stations, sensors, computer vision (note that this list is not exhaustive).
- Datacenter architecture design - floor plan, IT space layout, pathways
- Datacenter facilities operation - Workspaces, repair rooms, material flow into/out of building, material buffering and inventory management

Out of Scope Activities

The following areas will be out of scope of the OCP - Data Center Facilities: DC Automation:

- Datacenter facility power
- Datacenter facility cooling

Milestones

- First Steps
    - Develop a whitepaper of use cases in the Data Center Automation space
    - Develop a DC Automation technology roadmap
        - In each data center operation workstream, pick one technology to write a white paper on
- Opportunities
    - Technology
        - Sharing and feedback from service providers for new technologies that are being developed
        - Feedback from future users about what new products are needed
        - Set up a marketplace for solution in each operation workstream
        - Develop a reference case study/reference design for hyperscaler, colocation, edge etc. facilities to accelerate the technology adoption.
        - Identify gaps in adoption and develop actions to correct these gaps.
    - Standards

- Align with industry on a list of data center automation practices that need standardization
- Based on the list, define automation standards and provide guidance to relevant hyperscale, colo, and edge facilities
- The standard paper will focus on standards associated with each data center operations workstream in associated facilities (Tug operation and safety standard, Asset audit and tag standard, Disk destruction and data security standard, Disk movement standard, etc.)
- Map the standards to the technology roadmap
- Develop reference case studies to accelerate the standard adoption

Founding Members

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