Datacenter SAS/SATA Specification Update

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Compute Project®

Connect. Collaborate. Accelerate.



Problem

- Specifications are feature rich (T10, T13, SATA-IO), but:
 - What are the device requirements?
 - What do Datacenter customers require?
- No publicly available Datacenter HDD specification exists today
- Datacenter customers have their own confidential specifications:
 - Discourages industry innovation and collaboration
 - This generates extra industry work without additional value
- How can the industry generate focused test cases when they don't know what to test?
- Lack of collaboration slows innovation



Solution

MSFT/Meta have merged their HDD requirements into a single specification

MSFT/Meta plan to contribute this document to OCP Current Contribution Target Mid/2022





Benefits

- Standardize the requirements for datacenter HDDs
- Enable industry collaboration and innovation on new HDD technologies and features
- Reduced development and qualification resources (one firmware)
- Enable 3rd party companies to add increased value developing test suites based on datacenter needs
- Industry benefits to both HDD suppliers and HDD consumers
 - With increased knowledge and collaboration comes increased innovation



- All the requirements for a datacenter HDD
- Areas Include:
 - SAS/SATA Interface Requirements
 - Power

Project

- Reliability
- Performance
- Environmental
- Security
- Labeling and Compliance
- Sustainability
- Requirements are sorted by ID numbers for easy reference



SAS/SATA Interface Requirement Examples

- Specify the latest industry standards and specifications
 T10/T13 and SATA-IO revisions
- Define mandatory and optional features, log pages and commands
- General configurations and operational requirements
 - Write Cache Management
 - Firmware Download
 - Error Recovery
 - SMR Configurations
 - Interface Speed
 - Background Activities



Performance and Reliability Examples

- Datacenter performance metrics
 - Latency, IOPS and bandwidth for datacenter workloads
- MTBF and AFR requirements
 - Based on workload, temperature and humidity
- Reliability Metrics:
 - Load/Unload Cycles
 - EPO
 - Data Integrity
 - UBER
 - Head Degradation



Summary

- MSFT and Meta are looking forward to increased industry collaboration and innovation on HDDs
- The Datacenter SAS/SAS Specification covers the requirements for HDDs deployed in datacenters
- \bullet Plan to contribute the specification to OCP Mid/2022