Datacenter SAS/SATA Specification Update

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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
What is in the Specification?

• All the requirements for a datacenter HDD
• Areas Include:
  • SAS/SATA Interface Requirements
  • Power
  • 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
• Plan to contribute the specification to OCP Mid/2022