



the Future of Memory and Storage

The Benefits of OCP Compliance for NVMe SSD drives



TELEDYNE LECROY
Everywhere you look™

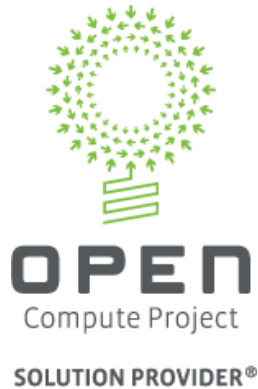
Austin Labs

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Speaker and Contact Info



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OCP – Open Compute Project

- What is OCP?
 - Community fosters collaboration
 - Supports startups to hyperscalers
 - Spans the data center IT infrastructure
 - Cooling, Networking, Rack and Power, Security, Storage, Telco...
- OCP is not a standards body
 - Drives new technology norms
 - Collaborative Specification



OPEN
Compute Project®

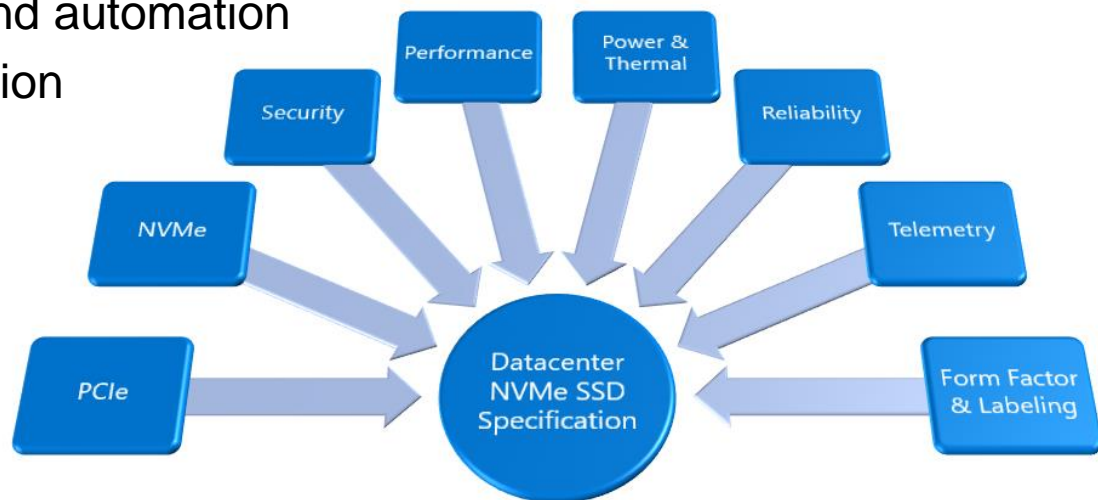
Connect

Collaborate

Accelerate

OCP for Datacenter NVMe SSD's

- Collaborative Specification
 - Driven by Microsoft, Meta, Dell, HPE, Google
 - Complimentary to NVMe Specifications
 - Must comply with NVMe Requirements
 - Collaboration to align on public specifications
 - Drives test development and automation
 - Provides Product Recognition
 - OCP Marketplace
 - OCP Accepted
 - OCP Inspired



Why is the OCP Specification Important?

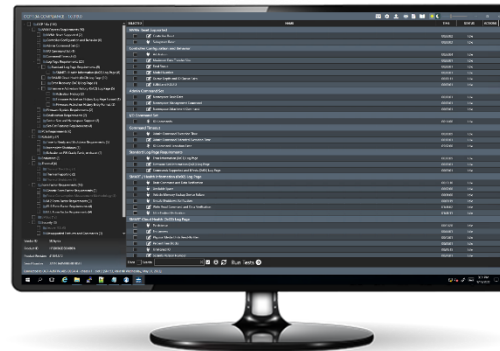
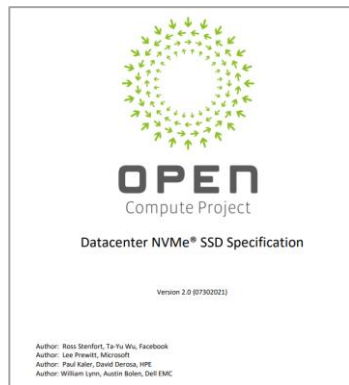
- Aligns SSD requirements between Hyperscale/OEMs and SSD makers
- Contributes to shared learnings based on Hyperscale and Enterprise configurations
- Enables focus on “customer” requirements
 - More efficient SSD Development – saves money
 - Enables 3rd party test development
 - Aligns drive vendors on specific cloud-based SKU's
 - More Features, Better Quality, and Faster Delivery



OPEN
COMMUNITY®

How does OCP Compliance work?

- OCP Storage Group Collaborates for a specification
 - OCP 1.0a – NVMe Cloud SSD Specification
 - Microsoft and Meta
 - OCP 2.0 – Datacenter NVMe SSD Specification
 - Microsoft, Meta, **HPE, Dell**
 - OCP 2.5/2.6 – Datacenter NVMe SSD Specification
 - Microsoft, Meta, HPE, Dell, **Google**

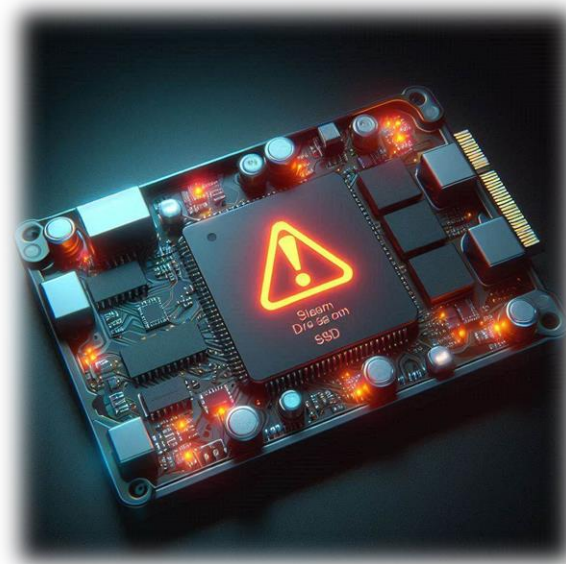


OCP 2.0 Test Requirements

Software Features			
NVMe Tests	Form Factor Tests	Endurance Tests	PCIe Tests
• NVMe Resets	• Generic Form Factor	• Endurance Data	• PCIe Maximum Payload
• NVMe Controller Configuration & Behavior	• M.2 Form Factor	• End of Life	• PCIe TLP Completion Timeouts
• NVMe Admin Command Set	• E1.S Form Factor	Thermal Tests	• PCIe Resets
• I/O Command Set	• E1.L Form Factor	• Throttling	• Boot
• Command Timeout	• Power Management	• Reporting	• PCIe Logging
• Log Page Requirements	SMBus Tests	• Shutdown	• Low Power Modes
• Firmware Updates	• SMBus Verification • Codes	Labeling Tests	Reliability Tests
• Deallocation	• SMBus Firmware Update Notification	• Manual Inspection	• PERST
• Sector Size and Namespace Support	• SMBus Data Verification	• Barcodes	• Controller Status Ready
• Set/Get Features	Security Tests	• Identify Command	• Shutdown Notification and Status
	• Unsupported Command Verification	Endurance Tests	• Device Stability and Data Integrity
	• Unsupported Feature Verification	• Endurance Data	• Fatal Status
	• Unsupported Log Page Verification	• End of Life	• Incomplete Shutdown
	• Secure Boot		

What's new for OCP 2.5?

- Security
 - TCG
- Telemetry
 - Decode
 - Evaluate and root cause problems
 - Determine the right next step when errors occur
- Debuggability
 - Smart Logs
 - Health Information
 - Latency Monitor
- Feedback from drive vendors
- Upgrades and bug fixes



Where do I go for help? The OCP Marketplace!

Welcome to the [OCP Marketplace](#), where you will find a comprehensive set of OCP offerings from our certified OCP Solution Providers designed to bring hyperscale innovation to the market. Solutions are based on OCP Accepted™ and OCP Inspired™ products as well as facilities which are OCP Ready™ certified.

Marketplace

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Integrated Solutions



Facilities & Services



Telecom & Edge



Products & Chiplets

OCP
Storage

OCP Accepted

- Products that carry the OCP Accepted recognition comply 100% with an OCP approved specification and the design files are open sourced and available.



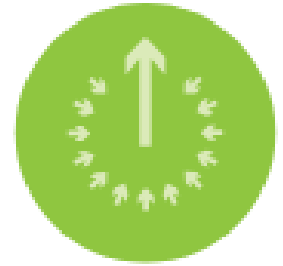
Specifications

Can be submitted without design files



Design Files

Must be based on a current approved Specification



OCP ACCEPTED

OCP Inspired

- Products that comply with an existing approved contribution and meet 3 of 5 OCP Tenants

- Efficiency
- Impact
- Openness
- Scalability
- Sustainability

Products —

- Storage (2)
 - Storage Testing Services (2)
- Show Less

Open Chiplet Economy —

Show More

Firmware —

Software —

Provider —

- Teledyne LeCroy (2)

Clear refinements

Results: All ☆ Favorites

Sort by: Relevance ▾

Teledyne LeCroy - OCP Compliance Test Suites 1.0a and 2.0

Teledyne LeCroy is a leading provider of test, validation, and benchmarking test platforms to the storage industry. Based on OCP v1.0a and 2.0 Com...

Solution Provider: Teledyne LeCroy

Model #: Teledyne LeCroy - OCP Compliance Test Suites 1.0a and 2.0

Associated Approved OCP Contributions



Teledyne LeCroy - OakGate SSD Test Solutions

Teledyne LeCroy is a leading provider of test, validation, and benchmarking test platforms to the storage industry. Ability to run the Teledyne LeCroy ...

Solution Provider: Teledyne LeCroy

Model #: Teledyne LeCroy - OakGate SSD Test Solutions

Associated Approved OCP Contributions



OCP INSPIRED™

OCP Experience Center

OCP Experience Centers seed emerging markets by allowing potential adopters to see and understand OCP equipment, channel and system integrators to conduct presales and engineers to develop new pre-product concepts.

OCP Experience Center (Austin, TX) - Hosted by Teledyne LeCroy

With state-of-the-art test facilities located around the world and industry expertise Austin Labs takes advantage of the wide array of Teledyne LeCr...

Solution Provider: Teledyne LeCroy

Model #: OCP Experience Center (Austin, TX) - Hosted by Teledyne LeCroy



OCP
Experience
Center
Austin, TX, USA

OCP Test and Validation

- [The OCP test and validation project](#) is a collaboration between data center hyperscalers participating in the OCP to provide a diagnostic framework. This framework aims to provide a portable solution for execution of hardware diagnostics, and a rich output model which can be cleanly integrated with various test executives, manufacturing execution systems, or lab data collection systems.
- The project was motivated by the common desire of being able to execute the same diagnostics across all phases of an NPI hardware projects life cycle including.
 - Hardware design and validation phases
 - Hardware bring up
 - System integration testing
 - Reliability testing
 - Third party lab validation
 - Mass production and deployment
 - Manufacturing
 - Data center operations
 - RMA and reverse logistics



Closing and Overview

- OCP Datacenter NVMe SSD Specification is growing
 - Will continue to expand
- OCP Compliance benefits
 - Aligns on customer requirements
 - Collaborative learning
 - Saves money
 - Enables 3rd Party Test Development
 - Branding and Logo



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About Teledyne LeCroy



Extensive range of tools for electrical, physical, logical and protocol layer testing

Protocol Analyzers and Test Appliances

Oscilloscopes

Electronic Test Equipment

Modular Data Acquisition

Sensors and Calibrators



Broad array of test solutions for serial data standards and next-gen technologies



Expert-level testing services and world-class training and educational services

Seminars and Webinars

Austin Labs Testing and Training

Frontline Test Services

Consulting

Device and Systems Testing



NEED ADDITIONAL HELP?



Austin Labs
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**TESTING,
TRAINING &
AUTOMATION**

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