



Changes in SNIA Emerald™ Power Efficiency Measurement Specification V4.0.0

Dave Thiel

SNIA Emerald Program Director

SNIA Emerald™ Training

*SNIA Emerald™ Power Efficiency
Measurement Specification*

Version 4.0.0

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Objective

- Identify changes made in SNIA Emerald™ Power Efficiency Measurement Specification
 - ◆ V4.0.0 relative to V3.0.3
- Assist testers in moving to V4.0.0 testing
 - ◆ V4.0.0 is referenced by ENERGY STAR® Data Center Storage Specification 2.0

Summary of Changes

- ▶ Primary purpose of V4.0.0: Specifically address Solid State Storage-based products
 - ◆ Major extension of Storage Taxonomy
 - ◆ Test procedures and metrics are the same as for Online products
- ▶ Other changes
 - ◆ More thorough articulation of Storage Taxonomy
 - ◆ Refinements of testing process
 - ◆ Changes to disclosure requirements
 - ◆ Clarifications, wording improvements
- ▶ This is a summary, not an authoritative or complete list of changes

Storage Taxonomy Changes – Clause 5

- Addressed by the next talk
- Terminology of the extended taxonomy applied throughout document (set, category, classification)

Definitions – Subclause 4.2

- Many clarifications
- Some new terms
- Relevant to revised taxonomy
 - ◆ “JBOD” definition
 - › “shelf that does not provide storage protection”
 - ◆ “Shelf” definition
 - › “modular enclosure suitable for installation in a rack”

➤ Added Table 10 - Test Procedure Overview

- ◆ Informative summary
- ◆ Identifies subclauses of the Measurement Specification applicable to testing products in the various taxonomy divisions



Block Access Conditioning Test – Subclause 7.3.4

➤ Tiered Storage Configuration Data Migration Phase – Subclause 7.3.4.2.2

- ◆ “IO intensity during the migration phase shall be at least **5 %**”
- ◆ Was previously **25 %**

➤ Impact

- ◆ May reduce time required to reach stable state
- ◆ Does not invalidate previous tests or test procedures

➤ Testing Requirements – Subclause 7.6.3

- ◆ “COM tests shall be run using the same access method (block or file) as used for other tests”
- ◆ Clarification of what the spec writers had assumed

➤ Generating Data Sets – Subclause 7.6.4

- ◆ “Each data set will be created in a directory named by the user located on the product under test.”

➤ Impact

- ◆ Each change may require a change in test practice
- ◆ Change to test time expected to be small

Removable Media Library Testing – Subclause 7.7

➤ Drive Counts – Subclause 7.7.1.2

- ◆ Required number of drives for Removable-5 and Removable-6 tests changed from 24 to **25** (see Table 24)
- ◆ Addresses an inconsistency with the Storage Taxonomy

➤ Pre-fill – Subclause 7.8.1

- ◆ Removed requirement that “all writes by the workload generator shall be 8 bit random data”
- ◆ The data pattern is determined by the Vdbench script

➤ Impact

- ◆ No impact on testers

- Test Characterization – Subclause 9.4
 - ◆ Added “Taxonomy set of the product under test”
- Product Under Test Description – Storage Controllers – Subclause 9.5.2
 - ◆ More detailed reporting of cache type and sizes
 - ◆ Modified “5. Controller **volatile cache size** (GiB)”
 - ◆ Added “6. Controller non-volatile cache size (GiB)”

➤ Product Under Test Description – Storage Media– Subclause 9.5.5

- ◆ Media rotational speed declared inapplicable to some products
- ◆ Modified “8. **Media volatile** cache size (MiB)”
- ◆ Added “9. Media non-volatile cache size (MiB)”
- ◆ Added “11. Media interface speed (Mb/s)”
- ◆ Added “12. Does media contribute to formatted capacity? (Yes or No)”

- Product Under Test Description – Host Protocol Controllers – Subclause 9.5.7
 - ◆ Changed units/scaling to match industry practice (was GiB/s)
 - ◆ “4. Host protocol controller nominal data rate (Gb/s)”

- *SNIA Emerald™ Power Efficiency Measurement Specification V4.0.0*
- *What has Changed? SNIA Emerald™ Measurement Specification V3.0.3 to V4.0.0*
- Available, along with many other resources for SNIA Emerald testers, at
 - ◆ www.sniaemerald.com/download/Spec_v4.0

Questions?