ENERGY STAR
Version 1.0 Storage Program Overview

November 18, 2015
U.S. Environmental Protection Agency

EPA and SNIA

- Collaboration over last 5 – 6 years

- SNIA developed Emerald^{TM} Specification

  - Test procedure adopted by EPA for ENERGY STAR Storage Version 1.0

  - Planned to continue for future Storage revisions

EPA and SNIA

- Current ENERGY STAR Storage specification result of years of discussions between EPA and SNIA

- How to use Emerald Specification in ENERGY STAR

- SNIA and its members have provided major contributions to the development of this specification.

- Feedback on drafts, hosting face-to-face talks, system test data, conference calls, training, and more.

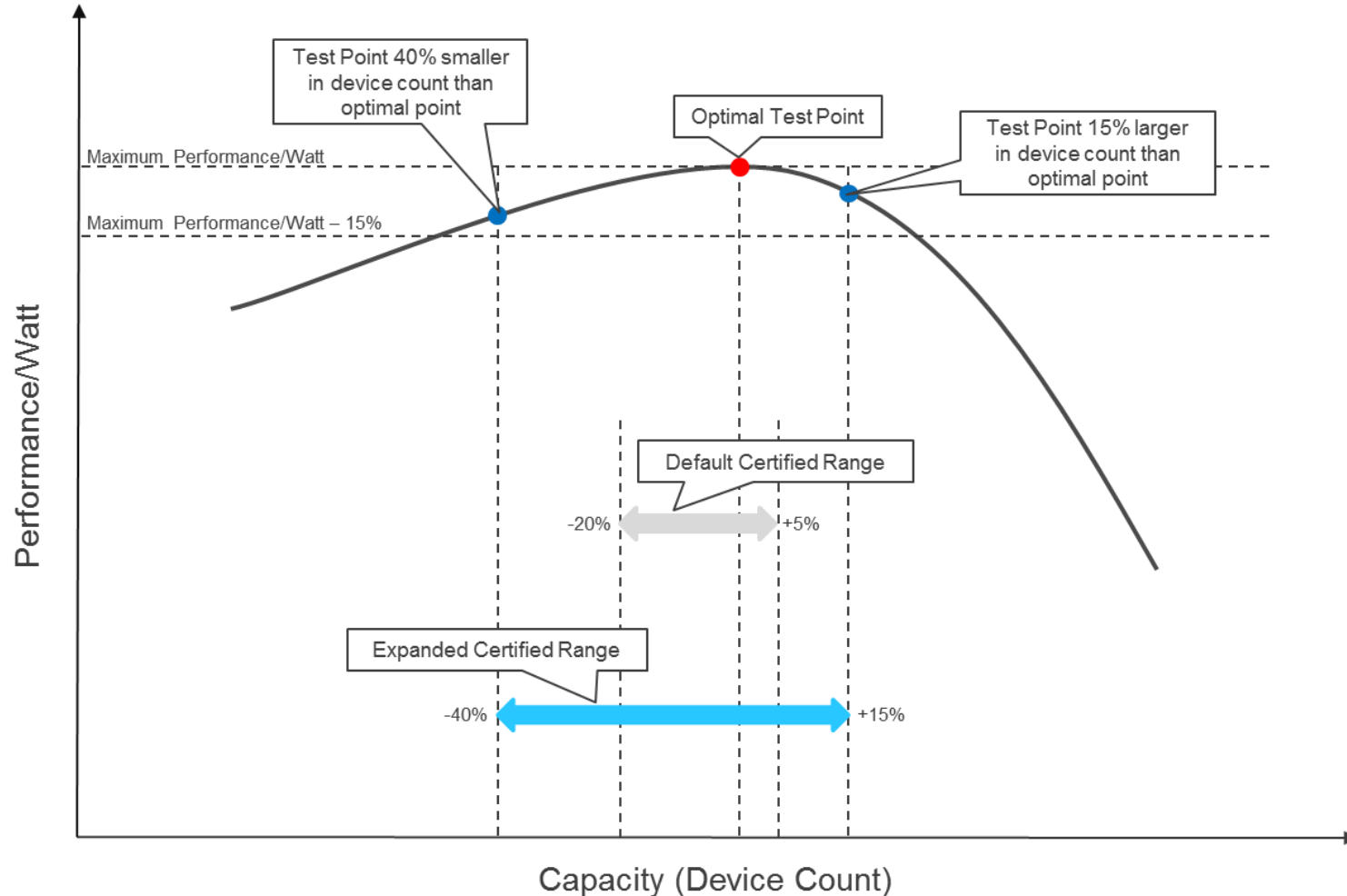- EPA looks forward to continuing to work with SNIA.

Data Center Storage – Version 1.0

- Version 1.0 finalized August 28, 2013 and became effective December 2, 2013
  - Covers Online 2-4 systems
    - <80ms response time, has RAID controller, 12 to hundreds of drives
  - Focuses on block I/O systems, but can test unified systems
    - Unified systems combine block I/O and file based I/O
    - Only tests block I/O performance and power
  - No levels set in Version 1.0, any product can certify within a certain range in system size (drive count) close to the product's optimal performance point (in performance/watt).
  - Provisions included to handle mixed drive configurations, auto-tiering solutions, and pure SSD configurations.
  - Provisions also included to allow the updating of drives within a storage product within certain performance boundaries to limit the need for frequent retesting

Data Center Storage – Product Family Structure

Data Center Storage – Version 1.0

- Binary Requirements:
    - Power supply efficiency requirements (minimum 80Plus Silver)
    - Minimum number of capacity optimizing methods (COMs) available in the product. COMs include:
        - Thin Provisioning, Data Deduplication, Compression, Data Snapshots
    - Adaptive active cooling (e.g. variable speed fans)
- Emerald performance/watt test data collected for the following workloads:
    - Hot band, random read, random write, sequential read, sequential write, ready idle
- Systems are optimized for one of three possible workload types
    - Transaction (IOPS/W), Streaming (MiBPS/W), Capacity (GB/W)

ENERGY STAR. The simple choice for energy efficiency.

Current Storage Certified Product List

- 120 products certified
- 12 manufacturers represented

Online Category Breakdown	
Online 2	26
Online 3	70
Online 4	24

Workload Configuration Representation	
Transaction	69
Streaming	56
Capacity	15

Storage Type	
Block I/O Only	94
Block I/O + NAS	26

References and Resources

- Certification Body Resources (including application form): www.energystar.gov/CBresources

- ENERGY STAR Data Center Storage specification revision: www.energystar.gov/NewSpecs

- Select "Data Center Storage"

Please send any additional comments to storage@energystar.gov or contact:

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