Introduction to GSI

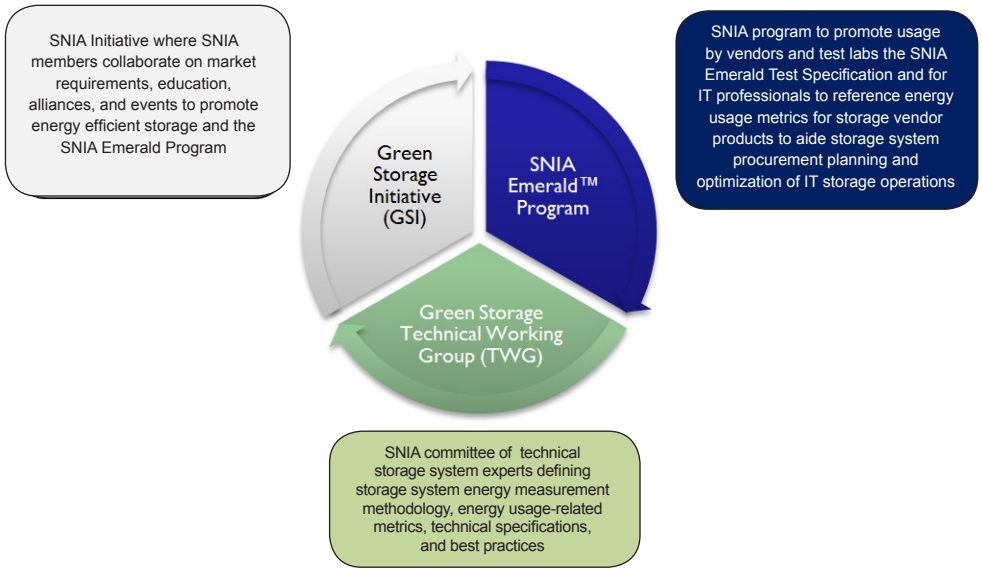
SNIA™
Green Storage Initiative

The Storage Networking Industry Association's (SNIA) Green Storage Initiative (GSI) is dedicated to advancing energy efficiency for networked storage systems through best practices and energy measurement metrics. The SNIA's Green Storage activities are coordinated and delivered through the SNIA Green Storage Technical Working Group (TWG) and the Green Storage Initiative.

The GSI is responsible for:

- Market development and adoption of the SNIA Emerald™ Program
- IT industry requirements for the Green Storage TWG technical specifications
- Cross-industry alliances and relationships with national bodies energy programs, standards bodies, and energy testing services.

SNIA Green Storage Overview



www.snia.org/gsi

The SNIA Emerald™ Program and the SNIA Emerald™ Power Efficiency Specification

SNIA Emerald™

The SNIA Emerald™ Program provides an envelope of activities and elements that further advance the use of storage system measurement procedures and test metrics as documented in the SNIA Emerald™ Power Efficiency Specification. Activities include:

- Periodic comprehensive industry training on how to prepare and test a storage system for vendors and independent test labs;
- Joint industry stakeholder meetings with regulatory bodies for the reference and use of Power Efficiency Specification, storage technology trends, and IT marketplace for storage;
- Elevating awareness of industry and national regulatory testing programs and analysis of submitted storage system test reports;
- Cross-industry alliances for testing tools, methods, and policy setting recommendations

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Relationship with the USA Environmental Protection Agency (EPA) ENERGY STAR Program

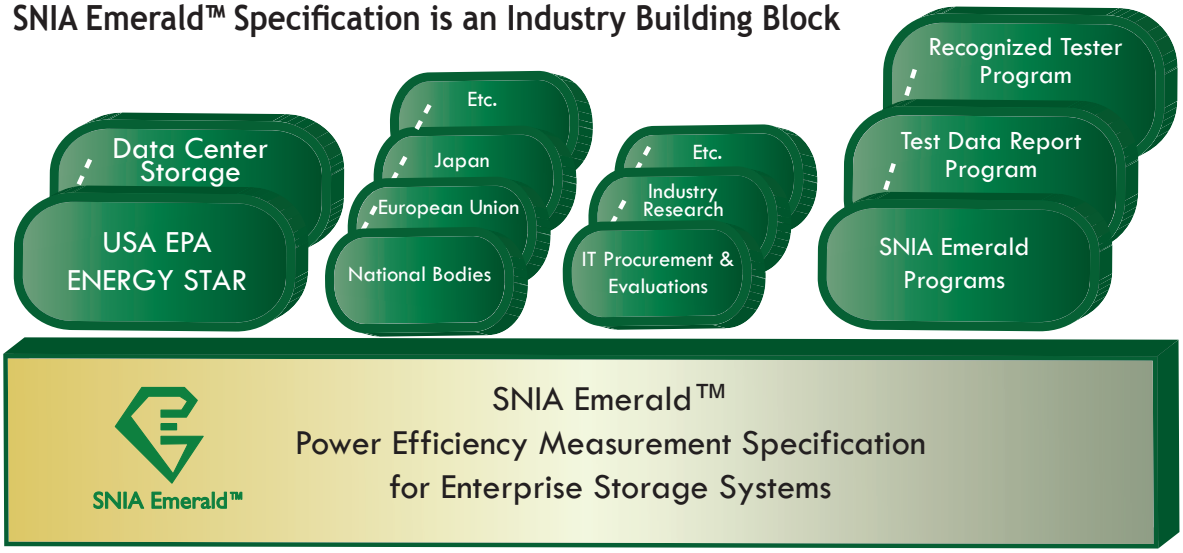
SNIA Emerald™

SNIA has proactively established an industry working relationship with the EPA with their initial focus on data center products. SNIA's ongoing collaboration with the EPA has helped to shape the Energy Star Data Center Storage (DCS) Specification. The EPA DCS specification references the SNIA Emerald Specification as the test and measurement methodology.

In this way, the SNIA Emerald™ Specification is a foundational building block upon which industry programs and activities are defined and prescribed as seen in the figure below.

"The EPA ENERGY STAR program is very supportive of the SNIA work on the storage system taxonomy and the test measurement methods contained within the SNIA Emerald Power Efficiency Measurement Specification," said Robert J. Meyers, Data Center Products Lead, EPA ENERGY STAR. "They form an excellent starting point in the industry effort to understand and improve storage system energy efficiency. Additionally, the data generated using the Emerald test method will help drive a wider industry discussion on energy efficiency, testing methods, and efficiency metrics."

SNIA Emerald™ Specification is an Industry Building Block



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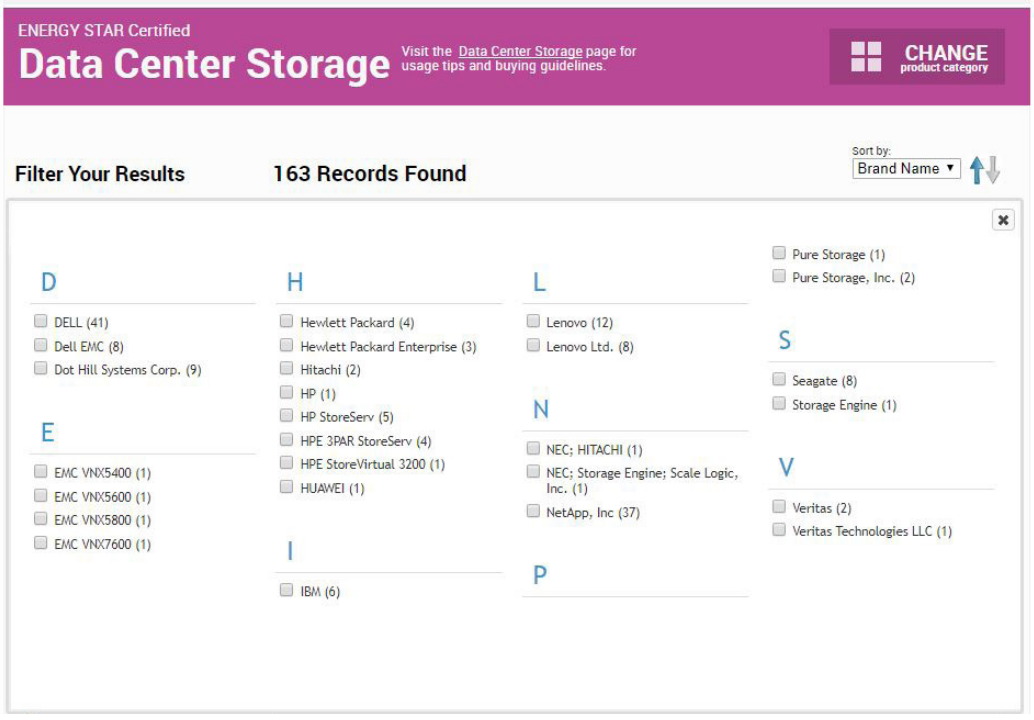
The SNIA Emerald™ Program

SNIA Emerald™

The SNIA Emerald™ Program is the focal point for the industry for SNIA Emerald™ Power Efficiency Measurement Specification, the Recognized Tester Program, and technical training for the SNIA Emerald™ test methodology.

The SNIA Emerald Specification is a building block for national and regulatory testing programs driving energy efficiency. The Unite States Environmental Protection Agency (EPA) Energy Star Program for Data Center Storage references the SNIA Emerald Specification and publishes storage vendor system test reports for public use to aide IT procurement, IT planning, and IT operations.



Source: EPA Energy Star for Data Center Storage Product Finder, August 2017

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The SNIA Emerald™ Program Process

The SNIA Emerald™ Power Efficiency Measurement Specification consists of the following elements:

- Taxonomy: An industry-wide way of segmenting storage systems for products that span the range from consumer solutions to enterprise configurations used to categorize the test results.
- Test Methodology: A detailed and consistent means of testing various types of storage systems with load generators and power measurement instruments.
- Test Metrics – Idle Measurement Test: The idle test applies to storage systems and components which are configured, powered up, connected to one or more hosts, and capable of satisfying externally- and application level-initiated IO requests within normal response time constraints.
- Test Metrics – Active Measurement Test: Testing of storage products and components is said to be in an active state when they are processing externally-initiated, application level requests for data transfer between a host(s) and the storage product(s).

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The SNIA Emerald™ Recognized Tester Program (RTP)

The Recognized Tester Program (RTP) recognizes commercially-oriented testing services that are competent in performing repeatable SNIA Emerald™ testing methods, procedures, and results. The program is based on a SNIA assessment of an applicant's test facility, test equipment, personnel, and methods. Applicant's meeting the assessment criteria will be acknowledged with a listing on the SNIA Emerald™ website as a Recognized Tester.

SNIA Emerald™
RECOGNIZED TESTER PROGRAM

The RTP program enables a global ecosystem of storage industry testing service providers, safety/environmental testing labs, EnergyStar certifying bodies, and manufacturers/testing labs seeking to provide consistency and conformance with the SNIA Emerald™ Program testing methods and the resulting test data.

The SNIA RTP makes it easier and quicker for manufacturers to find authorized testing services. The program complements the EPA EnergyStar directory of recognized test labs and certifying bodies. The RTP increases the quality of the ecosystem's services so that manufacturers' time to market, including EnergyStar testing, is not delayed, improving their ability to respond to RFPs with their latest product sets.

Visit www.sniaemerald.com or email emerald@snia.org for more information.

www.snia.org/emerald

Where to Go to Get More Information

SNIA™
Green Storage Initiative

Join the SNIA GSI at www.snia.org/forums/green/about/join

Activity/Benefit	SNIA GSI Member (Must be SNIA Member)	SNIA Green TWG Member	SNIA Emerald Newsletter (No membership required)
Industry collaboration with national bodies and industry associations for ICT energy efficiency programs, e.g. EPA, EU, APJ, SPEC, TGG, 80Plus	√	√	-
Member/company recognition, industry leadership for energy efficiency, SNIA GSI programs, market development and deliverables	√	-	-
Shape, contribute, and early access to SNIA energy measurement specifications referenced by national bodies, e.g. EPA	-	√	-
Access to technical expertise for energy test and measurement specification methods and development	-	√	-
Discounts on GSI fee-based programs	$$$	$	-
Access approved and published SNIA Emerald documents www.sniaemerald.com	√	√	√
Newsletter and notices for SNIA green storage activities, SNIA Emerald Program	√√	√√	√