



GREEN STORAGE TWG

2020 Review and 2021 Plans

Presented by:

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Green Storage TWG 2020 Accomplishments

[Green Storage TWG Charter link](#)

Recent completed work - summary

- Emerald Specification V3.0.3 became ISO 24091:2019
- January 2020 ENERGY STAR DCS Stakeholder Meeting
- Emerald V4.0 Specification including expanded Taxonomy completed in support of ENERGY STAR DCS V2.0
- Emerald V4.0 complete tester kit ready for download (scripts, how to documents, spec, links to tools)
- Ongoing data analysis of EPA Test Data Reports for Block IO and File IO (patterns and threshold setting)
- Idle data evaluation and analysis with SNIA-Japan
- Collaboration with TGG to refresh whitepaper #77, Storage Energy Efficiency and Architecture Trends
- Supported 2019 EPA DCS Unit Shipment Report Submissions; 2020 in progress
- Green terms into SNIA Dictionary is ongoing
- Swordfish DCIM feature requests to support energy measurement instrumentation
- Ongoing collaboration with SNIA-J for regional regulatory programs
- Collaboration with TGG on EU Lot9 Regulatory updates

| Green Storage TWG ROADMAP | | | CY 2021 | | | | CY2022 | | | |
|-----------------------------------|--|-------|---------|-----|-----|----|-----------------------------------|----|----|---|
| Approximate and subject to change | | | Oct | Nov | Dec | Q1 | Q2 | Q3 | Q4 | |
| # | Events | Owner | | | | | | | | |
| 1 | SNIA-GTWG F2F Invite EPA to concall | | | | | ▽ | Santa Clara Jan '21 virtual | | | |
| 2 | EPA-SNIA Industry Meetings | | | | | ▽ | EPA-SNIA update | | | |
| 3 | EPA DCStorage ENERGY STAR | | | | | ▽ | Becomes effective, replacing 1.1 | | | |
| 4 | ENERGY STAR Data Analysis | | | | | ▽ | New/update white paper w/ TGG | | ▽ | V2.0 data analysis |
| 5 | ISO version of Emerald | ▽ | | | | | | | | ▽ |
| | | | | | | | | | | Publish ISO standard based on Emerald 4.0 (updated vs. new, tbd) |
| 6 | Emerald Measurement Spec v4.0+ | | | | | | | | | Spec V4.0+ (?-tbd) |
| 7 | Validate existing SW tools (VdBench, COMGEN) | | | | | ▽ | | | | |
| 8 | Futures | | | | | | | | | SPEC Storage Solution 2020 |
| | Power / temp reporting | ▽ | | | | | | | | Incl. in Swordfish 1.0 |
| | Memory attached persistent storage | | | | | | | | | Consider for V4.0+ |
| | New workloads | | | | | | | | | |
| | Validate new tool/versions | | | | | | | | | |
| | Investigate SPEC Storage Sol'n 2020 | | | | | | | | | |
| | Test methodologies for capacity optimization, data protection, etc. (impact on performance, energy consumption) | | | | | | | | | |
| | Energy measurement for large / new distributed systems; consider component level measurement, consider small scale measurement as system indicator | | | | | | | | | |
| | Collaborate w/ other Servers, Switch | | | | | | | | | |
| | Cloud data centers | | | | | | | | | |
| | Object storage | | | | | | | | | |
| 9 | Partner Collaboration/Tracking | | | | | | | | | E*, TGG (incl 80PLUS, ECOS, Digital EU), Cleareresults (labels 80PLUS), |

- SNIA/EPA update, 27-Jan
- ENERGY STAR V2.0 effective, 15-Mar
- Update Data Center Storage Energy Efficiency White Paper, Q2
- V2.0 Data analysis, Q4
- Collaborate with TGG on EU Lot9 standards & regulation update, starts Q2

Green Storage TWG Membership as of 14-Jan-21

- Action Spot
- Dell, Inc.
- Fujitsu America
- HPE
- Hitachi
- IBM
- Kioxia Corp.
- NEC Corp.
- NetApp Inc.
- Oracle Corp.
- Quantum Corp. USA
- Samsung Electronics
- Seagate Technology
- Toshiba America

Green Storage TWG Participation

- What is the expected industry impact of this work
 - One architecturally unbiased test methodology to serve regulatory bodies worldwide
 - Proactively provide a single test methodology worldwide
 - Industry knowledge of storage system power consumption and best practices/configurations to optimize power usage w/o compromising system functionality
- What is the industry segment relevance
 - Storage System Manufacturers; Storage Device Manufacturers; DCIM SW Vendors
- Why you should join and participate in Green Storage TWG
 - Participate in developing Standards used worldwide for datacenter data storage power efficiency
 - Influence regulations worldwide related to datacenter data storage power efficiency
 - Refresh and renew focus on best practices (whitepapers, planning tools)
 - Maintain / create competitive advantage in product sustainability
 - Avoid being surprised when a new regulation goes live and affects your product portfolio/revenues
- Who to contact for additional information
 - GTWG Co-chairs: Don Goddard, Donald.Goddard@netapp.com Herb Tanzer, herbtanz@gmail.com