



Case Study #1 – Lessons Learned Demartek Test Lab

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SNIA Emerald™ Training

*SNIA Emerald Power Efficiency
Measurement Specification,*
for use in EPA ENERGY STAR®

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- We have been deploying enterprise storage systems from many different vendors in our test lab for several years.
 - ◆ We run ease-of-use, performance and other validation tests for a variety of storage vendors.
 - ◆ We also perform server and network testing.
- Became ISO 17025 Accredited Test Lab in late 2013.
 - ◆ Required for EPA ENERGY STAR testing
- Became Recognized EPA Test Lab for ENERGY STAR Data Center Storage in late 2013.
- Attended last year's SNIA Emerald training class

- ◆ We worked in close partnership with NetApp over the course of a few months to complete EPA ENERGY STAR Data Center Storage testing.
 - ◆ We worked with two divisions of NetApp for two different product families.
 - ◆ Relationship included some early practice runs, the full test runs and working together to complete all the required forms for EPA ENERGY STAR submissions.
- ◆ We developed a relationship with UL, the Certification Body, to help produce and complete the required forms
- ◆ We were the test lab for 146 of the 173 storage items currently listed on the EPA ENERGY STAR website.

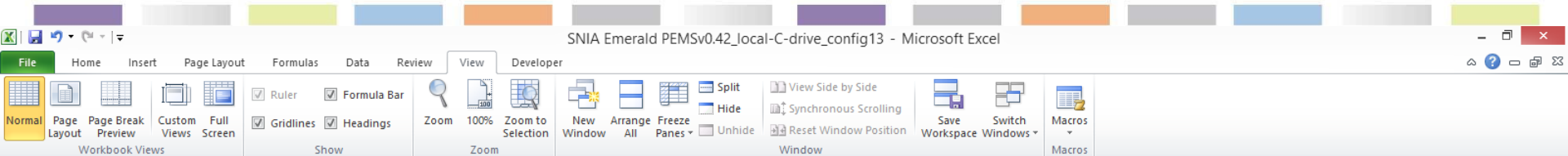
Demartek Processes

- Updated our process for inventorying incoming test systems including photos of every piece of equipment
- Created an Emerald/EPA start checklist before beginning a test
- Added “script reminders” that appear on screen to remind the tester of manual processes
- Created an Excel macro to automate the collection and merge of the VDBENCH, power meter, temperature and humidity data.
 - ◆ Secondary macros produce SNIA Emerald TDR, spreadsheets that go to our CB and EPA.

Standard Rack Configuration

- Our standard rack configuration for SNIA Emerald/EPA testing uses 230v, 60Hz as input power
- We added A/C Sources for racks devoted to EPA testing
- Rack components from top to bottom:
 - ◆ Ethernet switch to connect to rest of our network
 - ◆ A/C Source
 - ◆ Power Meter
 - ◆ Storage SUT
 - ◆ Server driving the workload and collecting data at bottom of rack
 - ◆ Switch and server powered from separate circuit
- Same server for workload, power and temperature data

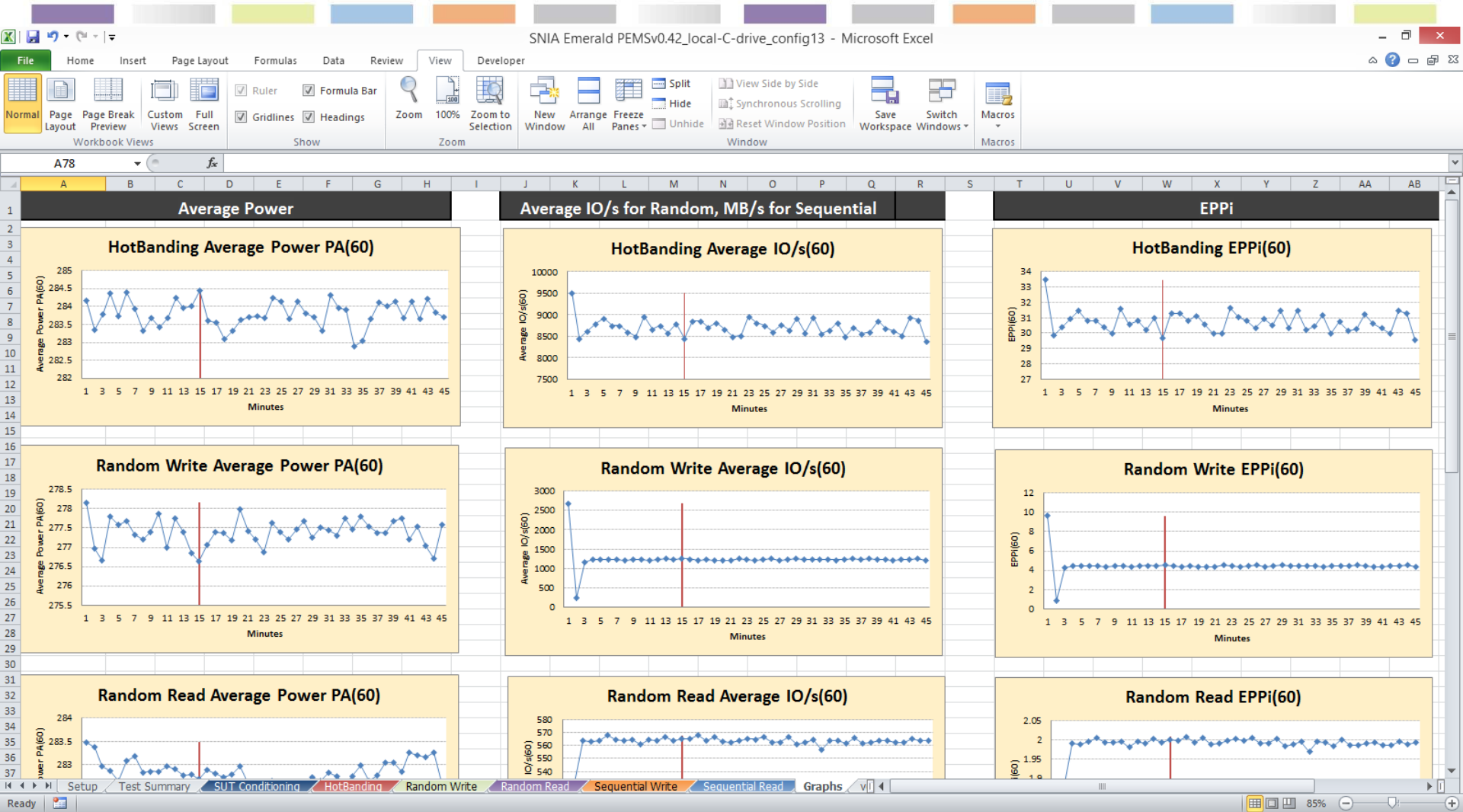
Excel data collection macro data



T36		SNIA Emerald PEMSv0.42_local-C-drive_config13 - Microsoft Excel																			
Tests Passed: 48		Tests Failed: 1																			
SUT Conditioning Test				Random Write												Sequential Write					
Test Name in Data:	rd_conditioning	Test Name in Data: rd_rw												Test Name in Data: rd_sw							
Total Run Time (min):	730	Total Run Time (min): 45												Total Run Time (min): 45							
Warm-up Period (min):	10	Warm-up Period (min): 15												Warm-up Period (min): 15							
Measurement Interval (min):	240	Measurement Interval (min): 30												Measurement Interval (min): 30							
Voltage Standard(V):	230	Voltage Standard(V): 230												Voltage Standard(V): 230							
Frequency Standard(Hz):	60	Frequency Standard(Hz): 60												Frequency Standard(Hz): 60							
Last Reading DT:	#####	Last Reading DT: 4/17/14 22:45:51												Last Reading DT: 4/18/14 0:15:53							
Beginning of Interval DT:	#####	Beginning of Interval DT: 4/17/14 22:15:51												Beginning of Interval DT: 4/17/14 23:45:53							
Metric:	MIN	MAX	AVG	PASS/FAIL	Metric:	MIN	MAX	AVG	PASS/FAIL	Metric:	MIN	MAX	AVG	PASS/FAIL							
RTA During Interval(ms):	1.1513	2.1115	1.489163867	PASS	RTA During Interval(ms):	0.6977	0.9742	0.807392798	PASS	RTA During Interval(ms):	6.7095	10.2985	7.9668526	PASS							
Harmonic Distortion(%):	0.12	0.156	0.136920205	PASS	Change in Stability(%):	0.046661546	0.4235751	0.173684689	PASS	Change in Stability(%):	0.00972677	0.9341307	0.2562486	PASS							
Voltage(V):	230.09	230.2	230.1229658	PASS	Harmonic Distortion(%):	0.12	0.155	0.136916667	PASS	Harmonic Distortion(%):	0.121	0.155	0.1370185	PASS							
Frequency(Hz):	59.999	60.001	60.00029144	PASS	Voltage(V):	230.1	230.18	230.1221111	PASS	Voltage(V):	230.1	230.18	230.1202	PASS							
Temp(F):	68.31	77	72.83712215	PASS	Frequency(Hz):	59.999	60.001	60.0003	PASS	Frequency(Hz):	59.999	60.001	60.000269	PASS							
Humidity(%):	27	35	30.71324201	PASS	Temp(F):	68.87	75.93	72.70035185	PASS	Temp(F):	68.87	76.31	72.707111	PASS							
Power PA During Interval:	278.01	290.23	283.8117008	PASS	Humidity(%):	25	31	27.86296296	PASS	Humidity(%):	27	33	29.987037	PASS							
IO/s During Interval:	6085.4	10926.8	8696.091496	PASS	Power PA During Interval:	275.14	279.88	277.3982548	PASS	Power PA During Interval:	282.07	287.72	284.78219	PASS							
EPPI During Interval:	21.88914068	37.648761	30.64035581	PASS	IO/s During Interval:	1017.6	1415	1229.069806	PASS	MS/s During Interval:	577.8	886.7	749.91981	PASS							
					EPPI During Interval(IO/s/W):	3.698480773	5.0557382	4.430704897	PASS	EPPI During Interval(MB/s/W):	2.048427695	3.0818157	2.6333101	PASS							
HotBanding Test				Random Read												Sequential Read					
Test Name in Data:	rd_hband	Test Name in Data: rd_rr												Test Name in Data: rd_sr							
Total Run Time (min):	45	Total Run Time (min): 45												Total Run Time (min): 45							
Warm-up Period (min):	15	Warm-up Period (min): 15												Warm-up Period (min): 15							
Measurement Interval (min):	30	Measurement Interval (min): 30												Measurement Interval (min): 30							
Voltage Standard(V):	230	Voltage Standard(V): 230												Voltage Standard(V): 230							
Frequency Standard(Hz):	60	Frequency Standard(Hz): 60												Frequency Standard(Hz): 60							
Last Reading DT:	#####	Last Reading DT: 4/17/14 23:30:52												Last Reading DT: 4/18/14 1:00:54							
Beginning of Interval DT:	#####	Beginning of Interval DT: 4/17/14 23:00:52												Beginning of Interval DT: 4/18/14 0:30:54							
Metric:	MIN	MAX	AVG	PASS/FAIL	Metric:	MIN	MAX	AVG	PASS/FAIL	Metric:	MIN	MAX	AVG	PASS/FAIL							
RTA During Interval(ms):	1.1906	1.9661	1.487830194	PASS	RTA During Interval(ms):	18.9257	22.5063	19.51005568	PASS	RTA During Interval(ms):	9.24	22.5506	19.878979	PASS							
Change in Stability(%):	0.060831174	0.7041576	0.430331398	PASS	Change in Stability(%):	0.002443894	0.1267406	0.055953062	PASS	Change in Stability(%):	0.033010899	30.049952	18.930777	FAIL							
Harmonic Distortion(%):	0.121	0.155	0.136985185	PASS	Harmonic Distortion(%):	0.12	0.155	0.137085185	PASS	Harmonic Distortion(%):	0.121	0.155	0.1368481	PASS							
Voltage(V):	230.1	230.18	230.1237963	PASS	Voltage(V):	230.1	230.18	230.1236481	PASS	Voltage(V):	230.1	230.19	230.12163	PASS							
Frequency(Hz):	59.999	60.001	60.0003463	PASS	Frequency(Hz):	59.999	60.001	60.00031852	PASS	Frequency(Hz):	59.999	60.001	60.000276	PASS							
Temp(F):	68.75	75.87	72.57818519	PASS	Temp(F):	68.56	76.18	73.63407407	PASS	Temp(F):	69.31	76.06	73.217296	PASS							
Humidity(%):	27	33	29.31851852	PASS	Humidity(%):	25	31	27.47962963	PASS	Humidity(%):	25	31	27.712963	PASS							



Excel macro charts



Keeping up with SNIA Emerald



Daily automated process that checks two Emerald web pages sends us email when something changes

The screenshot shows an email client interface with the following details:

- Subject:** Page "SNIA Emerald Download page" has changed: 46 changed words, 1 new link (<http://snia.org/emerald/download>)
- From:** Copernic Tracker <Copernic@demartek.com>
- To:** Dennis Martin; Jeff Giedt; Suzanne Stone; Jennifer Brunnings
- Sent:** Sat 6/28/2014 12:00 AM

The email content includes:

- Training**
Materials from [training sessions](#) on using the *Measurement Specification* to test a storage product and submit test results are available.
- Test Data Report Template**
The Test Data Report Template serves as both the input form for your test data and as the display form for what you submit (after conversion to PDF format).
Download the [report template V2.0.2-03](#) for use with the *Measurement Specification* V2.0.2.
The previous version of the report template remains available as [report template V2.0.2-02](#). The Emerald Program will accept Test Data submissions based on this v2.0.2-02 version of the report template through September 26, 2014.
- Order Form**
The SNIA Emerald Order form allows you to choose the method of payment and to fax or email your payment or PO information.

At the bottom of the email client, there is a link: [See more about: Copernic Tracker.](#)



SNIA Emerald

◆ EPA ENERGY STAR Data Center Storage certified products:

<https://data.energystar.gov/Government/ENERGY-STAR-Certified-Data-Center-Storage/gqtf-hp7x>