ENERGY STAR® Power and Performance Data Sheet

Dell PowerEdge R520 with Dell Energy Smart 750W PSU and Intel E5 2420/24

System Characteristics

Form Factor	2U rackmount
Available Processor Sockets	2
Available DIMM Slots / Max Memory Capacity	12/384 GB
ECC and/or Fully Buffered DIMMs	Yes
Available Expansion Slots	4 PCI-E
Minimum and Maximum # of Hard Drives	0 to 8
Redundant Power Supply Capable?	Yes
Power Supply Make and Model	Dell Energy Smart 750W
Power Supply Output Rating[1] (watts)	750
Minimum and Maximum # of Power Supplies	1/2
Input Power Range (AC or DC)	100-240VAC
Power Supply Efficiency at Specified Loadings	88.18%@10%, 92.18%@20%, 94.24%@50%, 93.69%@100%
Power Supply Power Factor at Specified Loadings	0.71@10%, 0.86@20%, 0.96@50%, 0.99@100%
Operating Systems Supported	Microsoft Windows® Server 2008, Small Business Server 2011; Red Hat Enterprise Linux 5.7 and 6.2 with Xen; SUSE Linux Enterprise Server 10 and 11; Vmware: ESX 4.1, ESX5.0; Cirtix XenServer 6
Installed Operating System for Testing	Microsoft Windows Essential Business Server 2008

System Configurations	Minimum	Typical	Maximum
Configuration ID			
Processor Information	Intel® Xeon E5-2420 (1.9GHz, 15M, 7.2GT/s, 6/12, 95W)x2	Intel® Xeon E5-2420 (1.9GHz, 15M, 7.2GT/s, 6/12, 95W)x2	Intel® Xeon E5-2440 (2.4GHz, 15M, 7.2GT/s, 6/12, 95W)x2
Memory Information	1x RDIMM, 2GB 1333Mhz, LV	6x RDIMM, 4GB 1333Mhz, LV	12x RDIMM, 32GB 1333Mhz, LV
Internal Storage	1x 3.5" SAS 300GB 15k HDD	6x 3.5" SAS 300GB 15k HDD	8x 3.5" SAS 300GB 15k HDD
I/O Devices	1 Gb onboard Ethernet x2	1 Gb onboard Ethernet x2, Dual Port 1GbE NICx1	1 Gb onboard Ethernet x2, Intel Dual port 10Gb Base-T adapterx2
Power Supply Number and Redundancy Configuration	750W Redundant PSUx1	750W Redundant PSUx2	750W Redundant PSUx2
Management Controller or Service Processor Installed?	Yes	Yes	Yes
Other Hardware Features / Accessories	PERC H310	DVD-ROM PERC H710 mini IDRAC 7 Express	DVD-ROM PERC H710 mini cardx1 PERC H810 IDRAC 7 Enterprise

Power Data	Minimum	Typical	Maximum
Idle Category (1S and 2S only)	Category D: Managed Dual Installed Processor (2P) Servers		
ENERGY STAR Idle Power Allowance (1S and 2S only)	58.0	132.0	937.0
Measured Idle Power (watts)	48.4	127.9	243.9
Power at Full Load[1] (watts)	72.1	232.2	514.2
Benchmark / Method Used for Full Load Test	Sandra Dhrystone isse 4.2		
Test Voltage and Frequency for Idle and Full Load Test	115 V/60 Hz		
Range of Total Estimated Energy Usage ** (kWh/year)	0,848 to 1,263	2,241 to 4,068	4,273 to 9,009
Link to Detailed Power Calculator (if available)	WWW.Dell.com/CALC		

1. Full load power represents the sustained, average power at 100% load of the given workload, and does not necessarily represent the absolute peak power or the highest average, sustained power possible for other workloads.

2. Estimated kWh/year gives the absolute range of energy use you could expect from continuous operation (24x7x365) and ranges from 100% idle usage to 100% full-load operation. The calculation also includes typical data center overhead at a ratio of 1 watt of overhead to every 1 watt of IT load (corresponding to a PUE of 2.0). Closer approximations may be found by using established power calculators and specific information about the intended operating environment (e.g., average time at Idle, data center PUE, etc.).

Power and Performance for Benchmark #1	Minimum	Typical	Maximum
Benchmark Used and Type of Workload	Sandra Dhrystone isse 4.2		
Avg. Power Measured During Benchmark Run	72.1	232.2	514.2
Benchmark Performance Score	27.5	110.6	148.0
Power Performance Ratio (perf score/avg. power)	0.38	0.48	0.29
Link to Full Benchmark Report (Where Available)			

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Power Saving Features	***Enabled on Shipment***	***End-User Enabling Required***
Processor Dynamic Voltage and Frequency Scaling	**Yes**	**No**
Processor or Core Reduced Power States	**Yes**	**No**
Power Capping	**Yes**	**No**
Variable Speed Fan Control Based on Power or Thermal Readings	**Yes**	**No**

Power and Temperature Measurement and Reporting

Input Power Available & Accuracy?	Yes, +/- 5% for 20%-100% of max PSU load
Input Air Temp Available & Accuracy?	Yes, +/- 2%
Processor Utilization Available?	Yes
Other Data Measurements Available & Accuracy?	
Compatible Protocols for Data Collection	IPMI
Averaging method and time period	Power: 1 min running average of 2s interval samples. Temperature: no averaging, 5s interval sampling.

Thermal Information [1]	***Minimum***	***Typical***	***Maximum***
Total Power Dissipation (watts)	78.7	261.7	483.0
Delta Temperature at Exhaust at 35C Peak Temp. (˚C)	9.4	9.7	10.1
Airflow at Maximum Fan Speed (CFM) at 35C Peak Temp.	33.8	128.1	117.6
Airflow at Nominal Fan Speed (CFM) at 25C Nominal Temp.	13.9	24.9	29.4

1. ASHRAE Extended Environmental Envelope Final August 1, 2008. Thermal Guidelines for Data Processing Environments, ASHRAE, 2004, ISBN 1-931862-43-5. Peak temperature is defined as 35 ˚C, Nominal Temperature is defined as 18 - 27 ˚C