ENERGY STAR® *Power and Performance Data Sheet*
Dell PowerEdge R510 Featuring the Dell 1100W PSU and Intel Xeon X5670

System Characteristics

Form Factor	2U
Available Processor Sockets	2
Available DIMM Slots / Max Memory Capacity	8/64 GB
ECC and/or Fully Buffered DIMMs	Yes
Available Expansion Slots	3 PCI-E
Minimum and Maximum # of Hard Drives	0 to 14
Redundant Power Supply Capable?	Yes
Power Supply Make and Model	Dell 1100W
Power Supply Output Rating* (watts)	1100
Minimum and Maximum # of Power Supplies	1 or 2
Input Power Range (AC or DC)	100-240VAC
Power Supply Efficiency at Specified Loadings*	84.9%@10%, 90.3%@20%, 92.6%@50%, 90.3%@100%
Power Supply Power Factor at Specified Loadings*	0.80@10%, 0.91@20%, 0.97@50%, 0.99@100%
Operating Systems Supported	Microsoft Windows® Server 2003 and 2008 Microsoft Windows Essential Business Server 2008 Microsoft Windows Small Business Server 2008 Red Hat Enterprise Linux 4 and 5 Citrix XenServer 5.x[3] Vmware ESXi 3.5[3] SUSE Linux Enterprise Server 10 and 11
Installed Operating System for Testing	Microsoft Windows Server 2008

* Note: Power supply information is for a single power supply only

System Configurations

Processor Information	2, Intel X5670
Memory Information	8 RDIMMs, 16 GB, 1067 MHz
Internal Storage	14x 600GB 15k SAS HDDs
I/O Devices	2x 1Gb LOMs + 2x Quad port 1 Gb NIC
Power Supply Number and Redundancy Configuration	2, 1+1 Redundant
Management Controller or Service Processor Installed?	Yes
Other Hardware Features / Accessories	iDRAC6 Enterprise, SAS6/iR, LPE 12002 FC HBA, PERC H700

Power Data

Idle Category (1S and 2S only)	Category D: Managed Dual Installed Processor (2P) Servers
ENERGY STAR Idle Power Allowance (1S and 2S only)	534
Measured Idle Power (watts)	374.0
Power at Full Load* (watts)	491.8
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)	6,552 to 8,616
Link to Detailed Power Calculator (if available)	WWW.Dell.com/CALC

* Note: 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.

** Note: Estimated kWh/year gives the absolute range of energy use a user 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

Benchmark #1		
	Benchmark Used and Type of Workload	Sandra Dhrystone isse 4.2
	Avg. Power Measured During Benchmark Run	491
	Benchmark Performance Score	78.7
	Power Performance Ratio (perf score/avg. power)	0.16
	Link to Full Benchmark Report (Where Available)	

Power and Performance for Benchmark #2 (optional)

Benchmark #2		
	Benchmark Used and Type of Workload	
	Avg. Power Measured During Benchmark Run	
	Benchmark Performance Score	
	Power Performance Ratio (perf score/avg. power)	
	Link to Full Benchmark Report (Where Available)	

ENERGY STAR Power and Performance Data Sheet

Dell PowerEdge R510 Featuring the Dell 1100W PSU and Intel Xeon X5670

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**
Low Power Memory States	**Yes**	**No**
Low Power I/O States	**Yes**	**No**
Liquid Cooling Capability	**No**	**No**
Other1:		
Other2:		
Other3:		
Other4:		

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

Thermal Information *

	Minimum	Typical	Maximum
Reference Configurations	2, Intel Xeon L5506 2x UDIMM, 1GB, 1067MHz 1x 160 GB 7.2k SATA HDD 2x 1Gb LOMs SAS 6iR	2, Intel Xeon E5540 6 UDIMM, 2GB, 1333MHz 4 500GB 7.2k SATA HDD 2x 1Gb LOMs SAS6/iR iDRAC6 Enterprise PERC H200 ODD	2, Intel Xeon X5570 8x RDIMM, 8GB, 1067MHz 7x 600 GB + 5x 300GB + 2x 146GB 15k SAS HDD 2x 1Gb LOMs + 1 Quad port NIC's + iDRAC 6 Enterprise PERC 6/I + H700 + LSI 2032 HBA ODD
Total Power Dissipation (watts)	397.0	481.0	593.0
Delta Temperature at Exhaust at Peak Temp. (˚C)	5.1	6.7	9.9
Airflow at Maximum Fan Speed (CFM) at Peak Temp.	140.0	130.0	108.0
Airflow at Nominal Fan Speed (CFM) at Nominal Temp.	49	44	44

* Thermal information is provided for the minimum, typical and maximum configurations for the model line
References: 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

Notes

1. SPECpower_ssj2008 is a registered trademark of the Standard Performance Evaluation Corporation (SPEC). Benchmark results stated above reflect results published on XX/XX/XX. For the latest SPECpower_ssj2008 benchmark results, visit http://www.spec.org/power_ssj2008.