



DELL
PowerEdge R720xd
 with
Suse SLES 11 SP3

TPCx-HS Rev. 1.2.0
TPC-Pricing Rev. 1.7.0

Report Date:
March 9, 2015

Total System Cost	TPCx-HS Performance Metric	Price/Performance
\$927,374	19.15 HSph@30TB	48,426.85 \$/HSph@30TB

Apache Hadoop Compatible Software	Operating System	Other Software	System Availability Date
Cloudera CDH 5.3.0, HDFS API ver 2, Map Reduce API ver 1	Suse SLES 11 SP3	Java HotSpot 1.7.0_55	March 9, 2015

System Configuration

Switches: 2
 Extreme Summit
 X670V-48t-BF-AC
 10 GbE

32 Servers

Server: Dell PowerEdge R720xd
 Processor: Xeon E5-2680v2, 2.80GHz, 25MiB L3
 Processors/Cores/Threads: 2/20/40
 Memory: 256GiB ECC DDR3 1866 MHz
 Drives: 21X 600GB 10K RPM SAS
 1 disk for root & swap
 20 disks for Hadoop data
 Storage controller: LSI SAS 9207-8i
 Network: Intel X540 DP 10GBASE-T (2 port, 10GbE)
 Both NICs bonded
 Drivers: mpt2sas, ixgbe
 Suse SLES 11 SP3
 Cloudera CDH 5.3.0

Total Servers: 32
 Total Processors/Cores/Threads: 64/640/1280
 Total Memory: 8192GiB
 Total Number of Storage Drives: 672
 Total Storage Capacity: 403.2TB

Physical Storage/Scale Factor	Scale Factor/Physical Memory
13.44	3.41

Cluster Configuration	
Total Servers	32X PowerEdge R720xd
Total Processors/Cores/Threads	64/640/1280
Total Memory	8192GiB
Total Storage Capacity	403.2TB

Server Configuration	
Processors	2X Intel Xeon E5-2680v2, 2.80GHz, 25MiB L3
Memory	256GiB
Storage Controller	Dell H220: LSI SAS9207-8i
Storage Devices	21X 600GB 10K SAS SFF HDD (internal)
Network Interface	Intel X540 DP 10GBASE-T (2 port, 10GbE)

Network Connectivity	
Network Switches	2X Extreme Summit X670V-48t-BF-AC



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Description	Part Number	Key	Unit Price	Quantity	Extended Price	3 yr. Maint. Price
PowerEdge R720xd, Intel Xeon E-26XX Processors	210-ABMY	1	1591.01	32	50912.32	
PowerEdge R720 Motherboard, TPM	591-BBBP	1		32	0.00	
Dell Hardware Limited Warranty Plus On Site Service Initial Year	936-0967	1	117.14	32		3748.48
Non-Mission Critical: 4-Hour 7x24 On-site Service After Problem Diagnosis, 2 Year						
Extended	936-7183	1	962.86	32		30811.52
ProSupport: 7x24 HW / SW Tech Support and Assistance, 3 Year	936-7263	1	1712.86	32		54811.52
Dell Hardware Limited Warranty Plus On Site Service Extended Year	939-3398	1	168.57	32		5394.24
Non-Mission Critical: 4-Hour 7x24 On-site Service After Problem Diagnosis, Initial Year	989-2611	1	180.00	32		5760.00
Dell ProSupport. For tech support, visit http://support.dell.com/ProSupport or call 1-800-945-3355	989-3439	1		32		0.00
On-Site Installation Declined	900-9997	1		32	0.00	
Proactive Maintenance Service Declined	926-2979	1		32	0.00	
PowerEdge R720 Shipping	331-4437	1		32	0.00	
Intel Ethernet X540 DP 10GBASE-T Server Adapter, Low Profile	430-4439	1	967.97	32	30975.04	
IDRAC7 Enterprise	421-5339	1	386.61	32	12371.52	
Broadcom 5720 QP 1Gb Network Daughter Card	430-4418	1	72.67	32	2325.44	
Chassis with up to 24, 2.5" Hard Drives	342-3566	1	668.47	32	21391.04	
No Bezel	313-0869	1		32	0.00	
Power Saving Dell Active Power Controller	330-5116	1		32	0.00	
No RAID for H310 (1-16 HDDs)	331-4533	1		32	0.00	
LSI 9207, Internal Passthrough Host Bus Adapter Card for R720 and R720 XD with 2.5in HDDs	342-5964	1	280.03	32	8960.96	
Heat Sink for PowerEdge R720 and R720xd	331-4508	1		32	0.00	
Intel Xeon E5-2680v2 2.8GHz, 25M Cache, 8.0GT/s QPI, Turbo, HT, 10C, 115W, Max Mem 1866MHz	338-BCUH	1	2266.37	32	72523.84	
DIMM Blanks for Systems with 2 Processors	317-8688	1		32	0.00	
Heat Sink for PowerEdge R720 and R720xd	331-4508	1		32	0.00	
Intel Xeon E5-2680v2 2.8GHz, 25M Cache, 8.0GT/s QPI, Turbo, HT, 10C, 115W, Max Mem 1866MHz, 2nd Proc	338-BCUI	1	2266.37	32	72523.84	
16GB RDIMM, 1866MT/s, Standard Volt, Dual Rank, x4 Data Width	370-AAWL	1	363.36	512	186040.32	
1866MT/s RDIMMs	370-AAWM	1		32	0.00	
Performance Optimized	331-4428	1		32	0.00	
600GB 10K RPM SAS 6Gbps 2.5in Hot-plug Hard Drive	342-0847	1	502.89	672	337942.08	
Electronic System Documentation and OpenManage DVD Kit for R720 and R720xd	331-5914	1		32	0.00	
ReadyRails Sliding Rails With Cable Management Arm	331-4433	1	183.13	32	5860.16	
Dual, Hot-plug, Redundant Power Supply (1+1), 1100W	331-4607	1	474.79	32	15193.28	
Power Cord, NEMA 5-15P to C13, 15 amp, wall plug, 10 feet / 3 meter	310-8509	1		64	0.00	
SUSE Linux Enterprise Server, Non Factory Install, Requires License and Subscription Selection	421-7145	1		32	0.00	
SuSe Enterprise Linux Server, 1-2 Socket, 3yr Subscription and Licensing, Physical	421-9362	1	3874.81	32	123993.92	included
No Media Required	421-5736	1		32	0.00	
Cloudera Enterprise Basic Edition, Capacity License, 24X7, Subscription (per TB, per year) for the Basic Edition of the Cloudera Enterprise platform.*	A8182567	1	178.00	1152	205056.00	included
DELL DISCOUNT 30%		1			-343820.93	-30157.73
Dell Quote number: 702936817		1				
Extreme Summit X670V-48t-BF-AC	17202	2	25995.00	2	51990.00	
EXTREME DISCOUNT hardware 35%		2			-18196.50	
Extreme support: EW 4hr AHR-17202	97007-17202	2	10920.00	2		21840.00
EXTREME DISCOUNT support 15%		2				-3276.00
Extreme quote number: VMwareCL102614 02		2				
Cat6a patch cable 10G RJ45 7ft (Inc 10% spares)	1117918	3	11.99	71	851.29	
CPI Adjustable ServerRack - 51U	1246776	3	614.99	2	1229.98	
Acer - LED monitor - 18.5" (Inc 2 spares)	2978003	3	87.99	3	263.97	
Logitech USB KB/Mouse (Inc 2 spares)	2124292	3	17.99	3	53.97	
				Total	838441.54	88932.03
				Three-year cost of ownership:		927374
				HSph@30TB:		19.15
				S/HSph@30TB:		48426.85

Notes:

* 384TB Hadoop data storage X 3 years: quantity=1152

Price Key:

- 1 - Dell, Brian Bassett (Brian_Bassett@Dell.com)
- 2 - Extreme, Randy Norman (rnorman@extremenetworks.com)
- 3 - CDW

Audited by Doug Johnson, InfoSizing Inc. (www.sizing.com)

"Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumptions about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmark specification. If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you."



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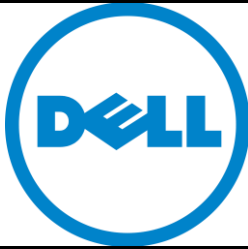
Numerical Quantities Summary

Measurement Results for Performance Run

Scale Factor	30TB
Run Start Time	2015/01/07 01:17:32
Run End Time	2015/01/07 02:51:26
Run Elapsed Time	5637.000
Start of HSGen	2015/01/07 01:17:32
End of HSGen	2015/01/07 01:35:22
HSGen Time	1072.006
Start of HSSort	2015/01/07 01:35:25
End of HSSort	2015/01/07 02:39:19
HSSort Time	3834.457
Start of HSValidate	2015/01/07 02:39:22
End of HSValidate	2015/01/07 02:51:26
HSValidate Time	725.668

Measurement Results for Repeatability Run

Scale Factor	30TB
Run Start Time	2015/01/06 23:41:35
Run End Time	2015/01/07 01:15:25
Run Elapsed Time	5632.000
Start of HSGen	2015/01/06 23:41:35
End of HSGen	2015/01/06 23:59:40
HSGen Time	1086.483
Start of HSSort	2015/01/06 23:59:43
End of HSSort	2015/01/07 01:03:19
HSSort Time	3817.509
Start of HSValidate	2015/01/07 01:03:24
End of HSValidate	2015/01/07 01:15:25
HSValidate Time	722.362



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Run report for Performance Run

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TPCx-HS Performance Metric (HSph@SF) Report

Test Run 2 details: Total Time = 5637
Total Size = 300000000000
Scale-Factor = 30.0000

TPCx-HS Performance Metric (HSph@SF): 19.1595
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Run report for Repeatability Run

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TPCx-HS Performance Metric (HSph@SF) Report

Test Run 1 details: Total Time = 5632
Total Size = 300000000000
Scale-Factor = 30.0000

TPCx-HS Performance Metric (HSph@SF): 19.1766
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