DELL EMC — PowerEdge R7515

TPCx-HS		2.0.3
TPC Pricing		2.4.0
Report Date		Sep. 17, 2019

Availability Date	TPCx-HS Performance	Price/Performance	Total System Cost
October 15, 2019	**11.62** HSph@3TB	**$38,544.15** $ / HSph@3TB	**$447,883 USD**

System Under Test Configuration Overview

Scale Factor	Hadoop Software	Operating System	Other Software
3	Cloudera Enterprise Edition 6.3	Red Hat Enterprise Linux Server 7.6	N/A

9x Dell PowerEdge R7515 Servers (Data Nodes)
- 1x AMD EPYC 7542 32-Core Processor
- 512 GB (8x 64GB RDIMM 3200MT/s Dual Rank)
- 2x240GB SSD SATA m.2 Hot-plug Drive
- 1x Mellanox Dual Port 100GbE QSFP28 NIC
- 3x Dell 1.6TB, NVMe, 2.5 SFF Drive

1x Dell PowerEdge R6525 Server (Master Node)
- 2x AMD EPYC 7502 32-Core Processor
- 512 GB (8x 64GB RDIMM 3200MT/s Dual Rank)
- 2x240GB SSD SATA 2.5in Hot-plug Drive
- 1x Broadcom Adv. Dual 25Gb Ethernet NIC (cluster connectivity)
- 1x Embedded Broadcom Gigabit NIC (external connectivity)

Mellanox SN2700

Physical Storage/Scale Factor: 16.00	Scale Factor/Physical Memory: 0.60

Total Number of Servers: Total Processors/Cores/Threads:	10 (9x PowerEdge R7515; 1x PowerEdge R6525) 11/352/704

Server Configuration: Processors	Per PowerEdge R7515 1x AMD EPYC 7542 32-Core Processor	Per PowerEdge R6525 2x AMD EPYC 7502 32-Core Processor
Memory	512 GiB	512 GiB
Storage Controller	Perc H740P	Perc H740P
Storage Device	2x 240GB SATA SSD m.2 3x Dell 1.6TB NVMe	2x 240GB SATA SSD m.2
Network	Mellanox Dual Port 100GbE	Broadcom Adv. Dual 25Gb
Connectivity:	Mellanox SN2700 (32-port, 100Gbe)	
Total Rack Units:	(9xR7515)+(1xR6525)+(1xMSN2700) = 18 + 1 + 1 = 20RU	

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Description	Part Number	Source	Unit Price	Qty	Extended Price	3 Yr. Maint. Price
HARDWARE COMPONENTS						
PowerEdge R7515		1	$41,778.17	9	$376,003.53	
PowerEdge R7515 Server	210-ASVQ	1	$0.00	1	$0.00	
PowerEdge R6515/R7515 Motherboard, with 2 x	384-BCEL	1	$0.00	1	$0.00	
No Trusted Platform Module	461-AADZ	1	$0.00	1	$0.00	
PowerEdge R7515 Shipping	340-CODN,	1	$0.00	1	$0.00	
PowerEdge R7515 Shipping Material,DAO w/CC Cert Marking	343-BBNT	1	$0.00	1	$0.00	
Standard Heatsink	412-AASE	1	$0.00	1	$0.00	
3200MT/s RDIMMs	370-AEVR	1	$0.00	1	$0.00	
Performance Optimized	370-AAIP	1	$0.00	1	$0.00	
No Media Required	605-BBFN	1	$0.00	1	$0.00	
iDRAC9, Express X5	385-BBOU	1	$0.00	1	$0.00	
iDRAC Group Manager, Disabled	379-BCQY	1	$0.00	1	$0.00	
iDRAC,Factory Generated Password	379-BCSF	1	$0.00	1	$0.00	
Single, Hot-plug Power Supply (1+0), 495W	450-ADWP	1	$0.00	1	$0.00	
NEMA 5-15P to C13 Wall Plug, 125 Volt, 15 AMP,	450-AALV	1	$0.00	1	$0.00	
PowerEdge 2U Standard Bezel	350-BBWP	1	$0.00	1	$0.00	
No Quick Sync	350-BBKU	1	$0.00	1	$0.00	
Performance BIOS Setting	384-BBBL	1	$0.00	1	$0.00	
ReadyRails Sliding Rails With Cable Management Arm	770-BBBR	1	$0.00	1	$0.00	
No Systems Documentation, No OpenManage DVD Kit	631-AACK	1	$0.00	1	$0.00	
US Order	332-1286	1	$0.00	1	$0.00	
Basic Deployment Dell Server R Series 1U/2U	804-6747	1	$0.00	1	$0.00	
Chassis with up to 24x2.5" Drives	379-BDTF	1	$0.00	1	$0.00	
No Internal Optical Drive for x10 or greater HDD Chassis	429-AAIQ	1	$0.00	1	$0.00	
Riser Config 2, 2 x 16 FH + 2 x 16 LP PCIe slot	330-BBNL	1	$0.00	1	$0.00	
NVMe Backplane	379-BDSX	1	$0.00	1	$0.00	
No Additional Mid Fan	384-BBSO	1	$0.00	1	$0.00	
2.5" Chassis with up to 24 NVMe Drives	321-BERW	1	$0.00	1	$0.00	
AMD EPYC 7542 2.90GHz, 2C/64T, 128M Cache (225W) DDR4-3200	338-BTYY	1	$0.00	1	$0.00	
64GB RDIMM, 3200MT/s, Dual Rank	370-AEVP	1	$0.00	8	$0.00	
C30, No RAID for NVME chassis	780-BCDO	1	$0.00	1	$0.00	
No Hard Drive	400-ABHL	1	$0.00	1	$0.00	
Dell 1.6TB, NVMe, Mixed Use Express Flash, 2.5 SFF Drive, U.2, PM1725b with Carrier	400-BEFC	1	$0.00	3	$0.00	
Mellanox ConnectX-5 EX Dual Port 40/100GbE	540-BCIU	1	$0.00	1	$0.00	
BOSS controller card + with 2 M.2 Sticks 240G	403-BCHM	1	$0.00	1	$0.00	
No Controller	405-AACD	1	$0.00	1	$0.00	
UEFI BIOS Boot Mode with GPT Partition	800-BBDM	1	$0.00	1	$0.00	
Keyboard and Optical Mouse, USB, Black, English	570-AAKV,	1	$12.00	3	$36.00	
3 Years ProSupport Plus Mission Critical 4Hr Onsite Service	827-1296,	1	$5,299.00	9		$47,691.00
Dell 24 Monitor - E2417H	E2417H	1	$169.99	3	$509.97	
Mellanox MSN2700-CS2F, 32 Port QSFP 100Gbe	MSN2700-		$35,913.00	1	$35,913.00	
1m (3ft) Dell DAC-Q28-100G-1M Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable	Q28-PC01		$29.00	11	$319.00	
3m (10ft) Dell DAC-Q28-4SFP28-25G-3M Compatible 100G QSFP28 to 4x25G SFP28 Passive Direct Attach Copper Breakout Cable	Q-		$93.00	3	$279.00	
C13 to C14, PDU Style, 12 AMP, 2 Feet (.6m) Power Cord, North America	492-BBDI	1	$20.00	22	$440.00	
APC NetShelter SX 24U 600mm x 1070mm Deep Enclosure	A7545498	1	$1,129.99	1	$1,129.99	
Rack PDU, Basic, Zero U, 15A, 120V, 5-15 input, (14) 5-15 output	A7541364	1	$174.99	1	$174.99	
Subtotal					$414,805.48	$47,691.00

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PowerEdge R6525 Server

Item	Part		Unit Price		Extended
PowerEdge R6525 Server	210-ATCF	1	$749.00	1	$749.00
BOSS controller card + with 2 M.2 sticks 240G (RAID 1), LP	403-BCHM	1	$879.00	1	$879.00
PowerEdge R6525 Motherboard, with 2 x 1Gb Onboard LOM (BCM5720)	384-BCGI	1	$0.00	1	$0.00
Very High Performance Fan for 10 x 2.5" or 10 x 2.5" + 2 x 2.5" chassis	384-BCGH	1	$399.00	1	$399.00
Chassis with up to 10 x 2.5" Hot Plug Hard Drives (2CPU & XGMI)	321-BEUP	1	$370.00	1	$370.00
No Trusted Platform Module	461-AADZ	1	$0.00	1	$0.00
PowerEdge R6525 Shipping Label, FCC2, PSU, 800W, w/o BIS	343-BBOL	1	$0.00	1	$0.00
PowerEdge R6525 x4 or x10 Drive Shipping Material	340-COGL	1	$99.00	1	$99.00
AMD EPYC 7502 2.00GHz/2.55GHz, 32C/64T, 64M Cache (180W) DDR4-2666	338-BSWD	1	$5,599.00	2	$11,198.00
Heatsink for 1st CPU, greater than or equal to 180W	412-AASH	1	$0.00	1	$0.00
Heatsink for 2nd CPU, greater than or equal to 180W	412-AASJ	1	$0.00	1	$0.00
3200MT/s RDIMMs	370-AEVR	1	$0.00	1	$0.00
64GB RDIMM, 3200MT/s Dual Rank	370-AEVP	1	$2,439.00	8	$19,512.00
Performance Optimized	370-AAIP	1	$0.00	1	$0.00
Unconfigured RAID	780-BCDS	1	$0.00	1	$0.00
PERC H745 for Chassis up to 10 drives	405-AAUZ	1	$1,199.00	1	$1,199.00
No Media Required	421-5736	1	$0.00	1	$0.00
iDRAC9,Enterprise	385-BBKT	1	$489.00	1	$489.00
iDRAC Group Manager, Disabled	379-BCQY	1	$0.00	1	$0.00
iDRAC, Factory Generated Password	379-BCSF	1	$0.00	1	$0.00
Riser Config 2, 1 x 16 LP PCIe slot (CPU1), 2 x 16 LP PCIe slot (CPU2)	330-BBNR	1	$349.00	1	$349.00
No Internal Optical Drive	429-ABBF	1	$0.00	1	$0.00
Dual, Hot-plug, Redundant Power Supply (1+1), 1400W	450-AIQZ	1	$1,699.00	1	$1,699.00
No Bezel	350-BBBW	1	$0.00	1	$0.00
Dell EMC Luggage Tag (x8 or x10 chassis)	350-BBXP	1	$0.00	1	$0.00
No Quick Sync	350-BBXM	1	$49.00	1	$49.00
Performance BIOS Settings	384-BBBL	1	$0.00	1	$0.00
UEFI BIOS Boot Mode with GPT Partition	800-BBDM	1	$0.00	1	$0.00
ReadyRails Sliding Rails With Cable Management Arm	770-BCKT	1	$189.00	1	$189.00
No Systems Documentation, No OpenManage DVD Kit	631-AACK	1	$0.00	2	$0.00
US Order	332-1286	1	$0.00	1	$0.00
ProSupport and 4Hr Mission Critical, 36 Month(s)	[865-BBNB]	1	$4,661.00	1	$4,661.00
No Installation	[900-9997]	1	$0.00	1	$0.00
NEMA 5-15P to C13 Wall Plug, 125 Volt, 15 AMP, 10 Feet (3m), Power Cord, North America	450-AALV	1	$0.00	2	$0.00
Sub Total				$37,180.00	$4,661.00

HARDWARE COMPONENTS				**Subtotal** $451,985.48	$52,352.00

SOFTWARE COMPONENTS					
Cloudera Enterprise Data Engineering (CDH 6.3), 3yr Node License	CEDEN-	1	$14,769.24	10	$147,692.40
Red Hat Linux Registration Document, No Subscription	340-AVFG	1	$0.00	10	$0.00
Enterprise Linux OS, Non Factory Installed, Requires Subscription Selection	605-BBFL	1	$0.00	10	$0.00
Red Hat Enterprise Linux, 1-2SKT, Physical Node, 3YR Premium Subscription, with up to 1 Virtual Guest	605-BBHO	1	$3,702.00	10	$37,020.00
SOFTWARE COMPONENTS				**Subtotal** $184,712.40	$0.00
Total				**$636,697.88**	**$52,352.00**
Large Purchase Discount (35%)*				-222,844.26	-18,323.20

Pricing: 1 = Dell	**Three-Year Cost of Ownership:**	**$447,883**
* Discount applies to all line items where Key = 1. Discount based upon total system cost as purchased by a regular customer.	**HSph@3TB:**	**11.62**
Audited by Doug Johnson, InfoSizing	**$ / HSph@3TB:**	**$38,544.15**

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated Line Items. 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 Line Items. For complete details, see the pricing section of the TPC Benchmark Standard. 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

Performance Run – Run 1

Scale Factor	3TB
Run Start Time	2019-09-09 21:02:53.000
Run End Time	2019-09-09 21:18:18.000
Run Elapsed Time	929.000
HSGen Start Time	2019-09-09 21:02:54.000
HSGen End Time	2019-09-09 21:06:11.000
HSGen Elapsed Time	198.808
HSSort Start Time	2019-09-09 21:06:17.000
HSSort End Time	2019-09-09 21:16:55.000
HSSort Elapsed Time	639.108
HSValidate Start Time	2019-09-09 21:17:01.000
HSValidate End Time	2019-09-09 21:18:18.000
HSValidate Elapsed Time	78.278

Repeatability Run – Run 2

Scale Factor	3TB
Run Start Time	2019-09-09 21:20:25.000
Run End Time	2019-09-09 21:35:49.000
Run Elapsed Time	927.000
HSGen Start Time	2019-09-09 21:20:26.000
HSGen End Time	2019-09-09 21:23:47.000
HSGen Elapsed Time	202.124
HSSort Start Time	2019-09-09 21:23:53.000
HSSort End Time	2019-09-09 21:34:17.000
HSSort Elapsed Time	625.454
HSValidate Start Time	2019-09-09 21:34:23.000
HSValidate End Time	2019-09-09 21:35:49.000
HSValidate Elapsed Time	86.889

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Run Reports

Run Report for Performance Run – Run 1

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TPCx-HS Performance Metric (HSph@SF) Report

Test Run 1 Details Total Time =   929
         Total Size = 30000000000
         Scale-Factor =   3

TPCx-HS Performance Metric (HSph@SF):   11.6279

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Run Report for Repeatability Run – Run 2

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TPCx-HS Performance Metric (HSph@SF) Report

Test Run 2 Details Total Time =   927
         Total Size = 30000000000
         Scale-Factor =   3

TPCx-HS Performance Metric (HSph@SF):   11.6504

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Revision History

Date	Edition	Description
September 17, 2019	First	Initial Publication

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