






	<h1>Dell PowerEdge R6415</h1>		TPCx-HS v2.0.3
			TPC Pricing v2.3.0
			Report Date Nov. 16, 2018
Availability Date October 9, 2018	TPCx-HS Performance 11.01 HSp@1TB	Price/Performance \$46,107.91 \$ / HSp@1TB	Total System Cost \$507,648 USD
System Under Test Configuration Overview			
Scale Factor 1	Hadoop Software Cloudera Enterprise Edition 6.0	Operating System Red Hat Enterprise Linux Server Release 7.5	Other Software Spark 2.2.0-cdh6.0
<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  ... 16x Dell PowerEdge R6415 Servers (Data Nodes) <ul style="list-style-type: none"> • 1x AMD EPYC 7551P 32-Core Processor • 256 GB (8x 32GB RDIMM 2666MT/s Dual Rank) • 1x 120GB SSD SATA 2.5in Hot-plug Drive • 1x Mellanox Dual Port 25GbE SFP28 NIC • 2x Dell 1.6TB, NVMe, 2.5 SFF Drive ...  ...  1x Dell PowerEdge R6415 Server (Master Node) <ul style="list-style-type: none"> • 1x AMD EPYC 7551P 32-Core Processor • 256 GB (8x 32GB RDIMM 2666MT/s Dual Rank) • 1x 120GB SSD SATA 2.5in Hot-plug Drive • 1x Mellanox Dual Port 25GbE SFP28 NIC </div> <div style="text-align: center;">  Dell S-Series (S5148F-ON) 48x25GbE and 6x100GbE Network Switch. </div> </div>			
Physical Storage/Scale Factor: 53.24		Scale Factor/Physical Memory: 0.24	
Total Number of Servers:		17x Dell PowerEdge R6415	
Total Processors/Cores/Threads:		17/544/1,088	
Server Configuration:		Per Dell PowerEdge R6415	
Processors		1x AMD EPYC 7551P 32-Core	
Memory		256 GiB	
Storage Controller		Perc H740P	
Storage Device		1x 120 GB SSD SATA (all nodes)	
		2x Dell 1.6TB NVMe (Data Nodes)	
Network		1x Mellanox Dual Port 25GbE SFP28 NIC	
Connectivity:		Dell S-Series (S5148F-ON) Network Switch	
Total Rack Units:		(17xR6415) + (1xS5148F) = (17x1) + (1x1) = 18RU	

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					Report Date	Nov. 16, 2018
Description	Part Number	Key	Unit Price	Qty	Extended Price	3 yr. Maint. Price
HARDWARE COMPONENTS						
PowerEdge R6415 Server						
PowerEdge R6415/R7415 Motherboard	210-ANJO	1	\$23,989.00	16	\$383,824.00	
No Trusted Platform Module	384-BBSR	1	\$0.00	16		
2.5" Chassis with up to 10 Hard Drives, including up to 8 SAS/SATA or 9 NVME Drives	461-AADZ	1	\$0.00	16		
PowerEdge R6415 Shipping	321-BDFY	1	\$0.00	16		
PowerEdge R6415 x4 or x10 Drive Shipping Material	340-BTFM	1	\$0.00	16		
AMD EPYC™ 7551P 2.00GHz/2.55GHz, 32C/64T, 64M Cache (180W) DDR4-2666	343-BBGL	1	\$0.00	16		
Standard Heatsink	338-BNCG	1	\$0.00	16		
2666MT/s RDIMMs	412-AALH	1	\$0.00	16		
Performance Optimized	370-ADNU	1	\$0.00	16		
Unconfigured RAID	370-AAIP	1	\$0.00	16		
PERC H740P RAID Controller, 8GB NV Cache, Mini card	780-BCDS	1	\$0.00	16		
No Operating System	405-AAMS	1	\$0.00	16		
No Media Required	619-ABVR	1	\$0.00	16		
iDRAC9, Enterprise	421-5736	1	\$0.00	16		
iDRAC Group Manager, Disabled	385-BBKT	1	\$0.00	16		
iDRAC, Factory Generated Password	379-BCQY	1	\$0.00	16		
Riser Config 1, 2 x 16 LP	379-BCSF	1	\$0.00	16		
On-Board LOM	330-BBIV	1	\$0.00	16		
No Internal Optical Drive	542-BBBP	1	\$0.00	16		
Dual, Hot Plug, Redundant Power Supply (1+1), 550W	429-AAIQ	1	\$0.00	16		
No Bezel	450-AGZB	1	\$0.00	16		
Dell EMC Luggage Tag	350-BBBW	1	\$0.00	16		
No Quick Sync	350-BBME	1	\$0.00	16		
Performance BIOS Settings	350-BBKR	1	\$0.00	16		
UEFI BIOS Boot Mode with GPT Partition	384-BBBL	1	\$0.00	16		
ReadyRails Sliding Rails With Cable Management Arm	800-BBDM	1	\$0.00	16		
No Systems Documentation, No OpenManage DVD Kit	770-BCKT	1	\$0.00	16		
US Order	631-AACK	1	\$0.00	16		
Dell Hardware Limited Warranty Plus On-Site Service	332-1286	1	\$0.00	16		
ProSupport Mission Critical: 7x24 HW / SW Technical Support and Assistance, 3 Years	816-0779	1	\$200.00	16		\$3,200.00
3 Years ProSupport and Mission Critical 4Hr Onsite Service	816-0779	1	\$1,438.00	16		\$23,008.00
Thank you choosing Dell ProSupport. For tech support, visit //www.dell.com/support or call 1-800- 945-3355	816-0780	1	\$262.00	16		\$4,192.00
On-Site Installation Declined	989-3439	1	\$0.00	16		
32GB RDIMM 2666MT/s Dual Rank	900-9997	1	\$0.00	16		
120GB SSD SATA Boot 6Gbps 512n 2.5in Hot-plug Drive, 1 DWPD, 219 TBW	370-ADNF	1	\$0.00	128		
Dell 1.6TB, NVMe, Mixed Use Express Flash, 2.5 SFF Drive, U.2, PM1725a with Carrier	400-AUMP	1	\$0.00	32		
Mellanox ConnectX-4 Lx Dual Port 25GbE SFP28 Network Adapter, Low Profile	406-BBLD	1	\$0.00	16		
C13 to C14, PDU Style, 12 AMP, 6.5 Feet (2m) Power Cord, North America	492-BBDI	1	\$0.00	32		
Dell EMC S5148F-ON Switch, 48x 25GbE, 6x 100GbE QSFP28, 10 to PSU, 2 PSU, OS10	210-ANCK	1	\$25,279.00	1	\$25,279.00	
OS10 Enterprise S5148F-ON	634-BMIF	1	\$0.00	1		
Dell Networking, Cable, SFP28 to SFP28, 25GbE, Passive Copper Twinax Direct Attach Cable, 2 Meter	470-ACET	1	\$0.00	1		
Dell EMC S5148 Series User Guide	343-BBFV	1	\$0.00	1		
US No Canada Ship Charge	332-1286	1	\$0.00	1		
Force10, Power Cord, 125V, 15A, 10 Feet, NEMA 5-15/C13, S-Series	450-AAFH	1	\$0.00	1		
Dell Hardware Limited Warranty 1 Year	814-8268	1	\$0.00	1		\$422.00
Thank you choosing Dell ProSupport. For tech support, visit //www.dell.com/support or call 1-800- 945-3355	989-3439	1	\$0.00	1		\$0.00
Dell Limited Hardware Warranty Extended Year(s)	975-3461	1	\$0.00	1		\$0.00
Mission Critical Package: 4-Hour 7X24 On-Site Service with Emergency Dispatch, 2 Year Extended	814-8278	1	\$423.00	1		\$423.00
ProSupport: 7x24 HW / SW Tech Support and Assistance, 3 Year	814-8288	1	\$5,956.00	1		\$5,956.00
Info 3rd Party Software Warranty provided by Vendor	997-6306	1	\$0.00	1		\$0.00
Mission Critical Package: 4-Hour 7X24 On-Site Service with Emergency Dispatch, 1 Year	814-8277	1	\$111.00	1		\$111.00
On-Site Installation Declined	900-9997	1	\$0.00	1		\$0.00
APC NetShelter SX 24U 600mm x 1070mm Deep Enclosure	A7067508	1	\$1,254.98	1	\$1,254.98	
Rack PDU, Basic, Zero U, 15A, 120V, 5-15 input, (14) 5-15 output	A7541364	1	\$0.00	1		
Logitech MK120 Keyboard and Mouse	A6999510	1	\$13.99	1	\$13.99	
Dell 24 Monitor	210-AIWG	1	\$169.99	1	\$169.99	
Subtotal					\$410,541.96	\$37,312.00

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Description		Part Number	Key	Unit Price	Qty	Extended Price	3 yr. Maint. Price
PowerEdge R6415 Server		210-ANJO	1	\$17,231.00	1	\$17,231.00	
PowerEdge R6415/R7415 Motherboard		384-BBSR	1	\$0.00	1		
No Trusted Platform Module		461-AADZ	1	\$0.00	1		
2.5" Chassis with up to 10 Hard Drives, including up to 8 SAS/SATA or 9 NVME Drives		321-BDFY	1	\$0.00	1		
PowerEdge R6415 Shipping		340-BTFM	1	\$0.00	1		
PowerEdge R6415 x4 or x10 Drive Shipping Material		343-BBGL	1	\$0.00	1		
AMD EPYC™ 7551P 2.00GHz/2.55GHz, 32C/64T, 64M Cache (180W) DDR4-2666		338-BNCG	1	\$0.00	1		
Standard Heatsink		412-AALH	1	\$0.00	1		
2666MT/s RDIMMs		370-ADNU	1	\$0.00	1		
Performance Optimized		370-AAIP	1	\$0.00	1		
Unconfigured RAID		780-BCDS	1	\$0.00	1		
PERC H740P RAID Controller, 8GB NV Cache, Mini card		405-AAMS	1	\$0.00	1		
No Operating System		619-ABVR	1	\$0.00	1		
No Media Required		421-5736	1	\$0.00	1		
iDRAC9,Enterprise		385-BBKT	1	\$0.00	1		
iDRAC Group Manager, Disabled		379-BCQY	1	\$0.00	1		
iDRAC,Factory Generated Password		379-BCSF	1	\$0.00	1		
Riser Config 1, 2 x 16 LP		330-BBIV	1	\$0.00	1		
On-Board LOM		542-BBBP	1	\$0.00	1		
No Internal Optical Drive		429-AAIQ	1	\$0.00	1		
Dual, Hot Plug, Redundant Power Supply (1+1), 550W		450-AGZB	1	\$0.00	1		
No Bezel		350-BBBW	1	\$0.00	1		
Dell EMC Luggage Tag		350-BBME	1	\$0.00	1		
No Quick Sync		350-BBKR	1	\$0.00	1		
Performance BIOS Settings		384-BBBL	1	\$0.00	1		
UEFI BIOS Boot Mode with GPT Partition		800-BBDM	1	\$0.00	1		
ReadyRails Sliding Rails With Cable Management Arm		770-BCKT	1	\$0.00	1		
No Systems Documentation, No OpenManage DVD Kit		631-AACK	1	\$0.00	2		
US Order		332-1286	1	\$0.00	1		
Dell Hardware Limited Warranty Plus On-Site Service		816-0779	1	\$200.00	1		\$200.00
ProSupport Mission Critical: 7x24 HW / SW Technical Support and Assistance, 3 Years		816-0779	1	\$1,438.00	1		\$1,438.00
3 Years ProSupport and Mission Critical 4Hr Onsite Service		816-0780	1	\$262.00	1		\$262.00
Thank you choosing Dell ProSupport. For tech support, visit //www.dell.com/support or call 1-800- 945-3355		989-3439	1	\$0.00	1		\$0.00
On-Site Installation Declined		900-9997	1	\$0.00	1		
32GB RDIMM 2666MT/s Dual Rank		370-ADNF	1	\$0.00	8		
120GB SSD SATA Boot 6Gbps 512n 2.5in Hot-plug Drive, 1 DWPD, 219 TBW		400-ASEG		\$0.00	1		
Mellanox ConnectX-4 Lx Dual Port 25GbE SFP28 Network Adapter, Low Profile		406-BBLD	1	\$0.00	1		
C13 to C14, PDU Style, 12 AMP, 6.5 Feet (2m) Power Cord, North America		492-BBDI	1	\$0.00	2		
Sub Total						\$17,231.00	\$1,900.00
HARDWARE COMPONENTS						Subtotal	\$427,772.96 \$39,212.00
SOFTWARE COMPONENTS							
Cloudera Enterprise Data Engineering Edition, Node License, 24x7, 3YR		CEDEN-GOLD	1	\$14,769.24	17		\$251,077.08
Red Hat Enterprise Linux Non Factory Install, x64,Reqs Lic &Sub Selection		421-4727	1	\$0.00	17	\$0.00	
Red Hat Enterprise Linux,1-2SKT,3yr Premium Subscription,1 Virtual Guest		421-5721	1	\$3,702	17		\$62,934.00
SOFTWARE COMPONENTS						Subtotal	\$0.00 \$314,011.08
Total						\$427,772.96	\$353,223.08
Large Purchase Discount (35%)*						-149,720.54	-123,628.08
Pricing: 1 = Dell		Three-Year Cost of Ownership:				\$507,648	
* Discount applies to all line items where Key = 1. Discount based upon total system cost as purchased by a regular customer.		HSpH@1TB:				11.01	
Audited by Doug Johnson, InfoSizing		\$/ HSpH@1TB:				\$46,107.91	
<p><i>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.</i></p>							

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		TPC Pricing	v2.3.0
		Report Date	Nov. 16, 2018

Numerical Quantities	
Performance Run – Run 1	
Scale Factor	1TB
Run Start Time	2018-09-29 08:47:09.000
Run End Time	2018-09-29 08:52:34.000
Run Elapsed Time	327.000
HSGen Start Time	2018-09-29 08:48:33.000
HSGen End Time	2018-09-29 08:48:33.000
HSGen Elapsed Time	84.340
HSSort Start Time	2018-09-29 08:52:06.000
HSSort End Time	2018-09-29 08:52:06.000
HSSort Elapsed Time	211.093
HSValidate Start Time	2018-09-29 08:52:34.000
HSValidate End Time	2018-09-29 08:52:34.000
HSValidate Elapsed Time	26.644
Repeatability Run – Run 2	
Scale Factor	1TB
Run Start Time	2018-09-29 08:53:40.000
Run End Time	2018-09-29 08:59:05.000
Run Elapsed Time	327.000
HSGen Start Time	2018-09-29 08:55:05.000
HSGen End Time	2018-09-29 08:55:05.000
HSGen Elapsed Time	85.757
HSSort Start Time	2018-09-29 08:58:36.000
HSSort End Time	2018-09-29 08:58:36.000
HSSort Elapsed Time	208.992
HSValidate Start Time	2018-09-29 08:59:05.000
HSValidate End Time	2018-09-29 08:59:05.000
HSValidate Elapsed Time	26.776



Dell PowerEdge R6415

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TPC Pricing	v2.3.0
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Run Reports

Run Report for Performance Run – Run 1

TPCx-HS Performance Metric (HSph@SF) Report

Test Run 1 Details	Total Time =	327
	Total Size =	10000000000
	Scale-Factor =	1

TPCx-HS Performance Metric (HSph@SF): 11.0132

Run Report for Repeatability Run – Run 2

TPCx-HS Performance Metric (HSph@SF) Report

Test Run 2 Details	Total Time =	327
	Total Size =	10000000000
	Scale-Factor =	1

TPCx-HS Performance Metric (HSph@SF): 11.0132

	Dell PowerEdge R6415	TPCx-HS	v2.0.3
		TPC Pricing	v2.3.0
		Report Date	Nov. 16, 2018

Revision History

Date	Edition	Description
October 9, 2018	First	Initial Publication
November 16, 2018	Second	Corrected Cloudera line item Unit Price. Corrected total number of storage devices.