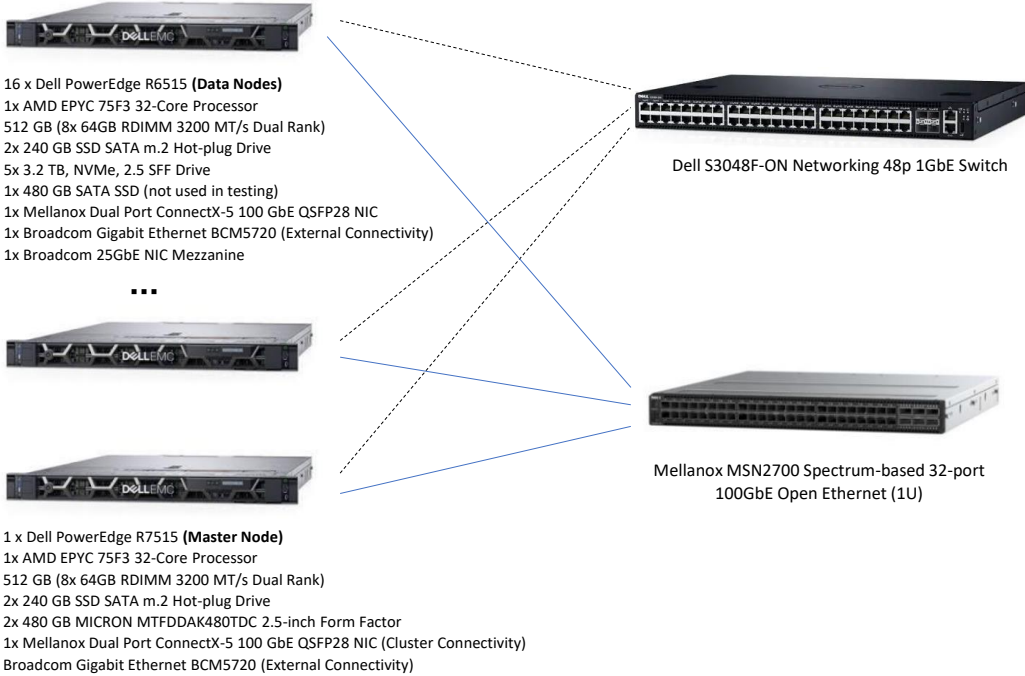

	<h1>Dell PowerEdge R6515</h1>		TPCx-HS	2.0.3
			TPC Pricing	2.6.0
			Report Date	Mar. 15, 2021
Availability Date	TPCx-HS Performance	Price/Performance	Total System Cost	
April 15, 2021	34.52 HSph@3TB	\$35,615.50 \$/HSph@3TB	\$1,229,447 USD	
System Under Test Configuration Overview				
Scale Factor	Hadoop Software	Operating System	Other Software	
3	Cloudera Enterprise 7.1.4	SUSE Linux Enterprise Server 12 SP5	None	
 <p>16 x Dell PowerEdge R6515 (Data Nodes) 1x AMD EPYC 75F3 32-Core Processor 512 GB (8x 64GB RDIMM 3200 MT/s Dual Rank) 2x 240 GB SSD SATA m.2 Hot-plug Drive 5x 3.2 TB, NVMe, 2.5 SFF Drive 1x 480 GB SATA SSD (not used in testing) 1x Mellanox Dual Port ConnectX-5 100 GbE QSFP28 NIC 1x Broadcom Gigabit Ethernet BCM5720 (External Connectivity) 1x Broadcom 25GbE NIC Mezzanine</p> <p>...</p> <p>1 x Dell PowerEdge R7515 (Master Node) 1x AMD EPYC 75F3 32-Core Processor 512 GB (8x 64GB RDIMM 3200 MT/s Dual Rank) 2x 240 GB SSD SATA m.2 Hot-plug Drive 2x 480 GB MICRON MTFDDAK480TDC 2.5-inch Form Factor 1x Mellanox Dual Port ConnectX-5 100 GbE QSFP28 NIC (Cluster Connectivity) Broadcom Gigabit Ethernet BCM5720 (External Connectivity)</p> <p>Dell S3048F-ON Networking 48p 1GbE Switch</p> <p>Mellanox MSN2700 Spectrum-based 32-port 100GbE Open Ethernet (1U)</p>				
Physical Storage/Scale Factor: 88.37		Scale Factor/Physical Memory: 0.35		
Total Number of Servers:		17 (16x PowerEdge R6515; 1x PowerEdge R7515)		
Total Processors/Cores/Threads:		17/544/1,088		
Server Configuration:	Per PowerEdge R6515	Per PowerEdge R7515		
Processors	1x AMD EPYC 75F3 32-Core	1x AMD EPYC 75F3 32-Core		
Memory	512 GiB	512 GiB		
Storage Controller	BOSS-S1	BOSS-S1, HBA330 Mini		
Storage Device	2x 240GB M.2 SATA SSD	2x 240GB M.2 SATA SSD		
	5x 3.2TB NVMe	2x 480GB SATA 6Gbps SSD		
Network	1x Mellanox Dual-port 100 Gb QSFP	1x Mellanox Dual-port 100 Gb QSFP		
	1x Broadcom 25 Gb NIC Mezzanine			
Connectivity:	1x MSN2700 32-port 100 GbE Switch; 1x S3048F-ON 48p 1 GbE Switch			
Total Rack Units:	16x(1U)+1x(2U)+1x(1U) +1x(1U) = 16U +2U + 1U + 1U = 20U			

	<h1 style="text-align: center;">Dell PowerEdge R6515</h1>					TPCx-HS	2.0.3
						TPC Pricing	2.6.0
						Report Date	Mar. 15, 2021
Description		Part Number	Source	Unit Price	Qty	Extended Price	3 Yr. Maint. Price
HARDWARE COMPONENTS							
PowerEdge R6515 - Data Nodes				1	\$69,360.66	16	\$1,109,770.56
2.5 Chassis		379-BDTF			1	16	
PowerEdge R6515 Server		210-ASVR			1	16	
No Trusted Platform Module		461-AADZ			1	16	
2.5" Chassis with up to 10 Hard Drives, including up to 8 SAS/SATA or 9 NVME Drives		321-BERT			1	16	
AMD EPYC 75F3 3.3GHz, 32C/64T, 256M Cache (280W) DDR4-3200		338-BZRK			1	16	
Heatsink for CPU equal to or greater than 180W		412-AAAC			1	16	
Performance Optimized		370-AAIP			1	16	
3200MT/s RDIMMs		370-AEVR			1	16	
Unconfigured RAID		780-BCDS			1	16	
HBA330 12Gbps SAS HBA Controller, Minicard		405-AAJU			1	16	
Performance BIOS Settings		384-BBBL			1	16	
UEFI BIOS Boot Mode with GPT Partition		800-BBDM			1	16	
No Additional Mid Fan		384-BBSO			1	16	
Dual, Hot Plug, Redundant Power Supply (1+1), 550W		450-AGUJ			1	16	
Riser Config 2, 2x16 LP PCIe slot		330-BBNN			1	16	
PowerEdge R6515 Motherboard, with 2 x 1Gb Onboard LOM (BCM5720) V2		384-BCNQ			1	16	
iDRAC9,Enterprise x5		385-BBOT			1	16	
Broadcom 57414 Dual Port 25GbE SFP28 LOM Mezz Card		540-BCKU			1	16	
LCD Bezel for x10 chassis		350-BBXX			1	16	
BOSS controller card + with 2 M.2 Sticks 240G (RAID 1),LP		403-BCHI			1	16	
No Quick Sync		350-BBKR			1	16	
iDRAC,Legacy Password		379-BCSG			1	16	
iDRAC Group Manager, Enabled		379-BCQV			1	16	
Enterprise Linux OS, Non Factory Installed, Requires Subscription Selection		605-BBFL			1	16	
SUSE Linux Enterprise Server, 1-2 SKT w Unlimited VMs, L3 Subscription, 3 Year		528-CHFF			1	16	
No Media Required		605-BBFN			1	16	
ReadyRails Sliding Rails Without Cable Management Arm		770-BCJI			1	16	
No Internal Optical Drive		429-AAIQ			1	16	
No Systems Documentation, No OpenManage DVD Kit		631-AACK			1	16	
PowerEdge R6515 Shipping		340-CMZJ			1	16	
PowerEdge R6515 x4 or x10 Shipping Material		343-BBMS			1	16	
PowerEdge R6515 CCC Marking		389-DUHM			1	16	
Basic Next Business Day 36 Months		709-BBFL			1	16	included
Prosupport Plus and 4Hr Mission Critical Initial, 36 Month(s)		865-BBNF			1	16	included
64GB RDIMM, 3200MT/s, Dual Rank		370-AEVP			1	128	
480GB SSD SATA Mix Use 6Gbps 512 2.5in Hot-plug AG Drive, 3 DWPD, 2628 TBW		400-AZUT			1	16	
Dell 3.2TB, NVMe, Mixed Use Express Flash, 2.5 SFF Drive, U.2, PM1725b with Carrier		400-BEFE			1	80	
Power Cord - C13, 3M, 125V, 15A (North America, Guam, North Marianas, Philippines, Samoa, Vietnam)		450-AALV			1	32	
Mellanox ConnectX-5 EX Dual Port 40/100GbE QSFP28 Adapter, PCIe Low Profile		540-BCIX			1	16	
SUSE Linux Enterprise Server, 1-2 SKT w Unlimited VMs, L3 Subscription, 3 Year, Digitally Fulfilled		528-CHFF			1	16	included
GCP Operations Management		929-8509			1	16	
(continued on next page)							

	<h1 style="margin: 0;">Dell PowerEdge R6515</h1>		TPCx-HS	2.0.3		
			TPC Pricing	2.6.0		
			Report Date	Mar. 15, 2021		
(continued from previous page)						
Description	Part Number	Source	Unit Price	Qty	Extended Price	3 Yr. Maint. Price
PowerEdge R7515 - Master Node			1	\$47,268.70	1	\$47,268.70
2.5 Chassis	379-BDTF		1		1	
SAS/SATA/NVMe Capable Backplane	379-BDSW		1		1	
PowerEdge R7515 Server	210-ASVQ		1		1	
No Trusted Platform Module	461-AADZ		1		1	
Chassis with up to 24 x 2.5" Hard Drives Including Maximum of 12 NVME Drives	321-BERS		1		1	
AMD EPYC 75F3 3.3GHz, 32C/64T, 256M Cache (280W) DDR4-3200	338-BZRK		1		1	
Standard Heatsink	412-AASE		1		1	
Performance Optimized	370-AAIP		1		1	
3200MT/s RDIMMs	370-AEVR		1		1	
Unconfigured RAID	780-BCDS		1		1	
HBA330 12Gbps SAS HBA Controller, Minicard	405-AAJU		1		1	
Performance BIOS Settings	384-BBBL		1		1	
UEFI BIOS Boot Mode with GPT Partition	800-BBDM		1		1	
High Performance Fan	750-AAWT		1		1	
Dual, Hot-plug, Redundant Power Supply (1+1), 1100W	450-ADWM		1		1	
Riser Config 2, 2 x 16 FH + 2 x 16 LP PCIe slot	330-BBNL		1		1	
PowerEdge R7515 Motherboard, with 2 x 1Gb Onboard LOM (BCM5720) V2	384-BCNR		1		1	
iDRAC9,Enterprise x5	385-BBOT		1		1	
PowerEdge 2U Standard Bezel	350-BBWP		1		1	
BOSS controller card + with 2 M.2 Sticks 240G (RAID 1),FH	403-BCHP		1		1	
No Quick Sync	350-BBKU		1		1	
iDRAC,Legacy Password	379-BCSG		1		1	
iDRAC Group Manager, Enabled	379-BCQV		1		1	
Enterprise Linux OS, Non Factory Installed, Requires Subscription Selection	605-BBFL		1		1	
SUSE Linux Enterprise Server, 1-2 SKT w Unlimited VMs, L3 Subscription, 3 Year	528-CHFF		1		1	
No Media Required	605-BBFN		1		1	
ReadyRails Sliding Rails	770-BBBQ		1		1	
No Internal Optical Drive	429-AAIQ		1		1	
No Systems Documentation, No OpenManage DVD Kit	631-AACK		1		1	
PowerEdge R7515 Shipping	340-CMZG		1		1	
PowerEdge R7515 Ship Material	340-CODN		1		1	
PowerEdge R7515 CCC Marking, No CE Marking	343-BBPQ		1		1	
GCP Operations Management	929-8509		1		1	
Basic Next Business Day 36 Months	709-BBFM		1		1	included
Prosupport Plus and 4Hr Mission Critical Initial, 36 Month(s)	865-BBNF		1		1	included
On-Site Installation Declined	900-9997		1		1	
64GB RDIMM, 3200MT/s, Dual Rank	370-AEVP		1		8	
480GB SSD SATA Read Intensive 6Gbps 512 2.5in Hot-plug AG Drive, 1 DWPD, 876 TBW	400-AXTV		1		2	
Jumper Cord - C13/C14, 4M, 250V, 12A (North America, Guam, North Marianas, Philippines, Samoa)	492-BBDV		1		2	
Mellanox ConnectX-5 EX Dual Port 40/100GbE QSFP28 Adapter, PCIe Low Profile	540-BCIX		1		1	
SUSE Linux Enterprise Server, 1-2 SKT w Unlimited VMs, L3 Subscription, 3 Year, Digitally Fulfilled	528-CHFF		1		1	included
(continued on next page)						


	<h1>Dell PowerEdge R6515</h1>	TPCx-HS	2.0.3
		TPC Pricing	2.6.0
		Report Date	Mar. 15, 2021

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Description	Part Number	Source	Unit Price	Qty	Extended Price	3 Yr. Maint. Price
Mellanox® Passive Copper cable, ETH 100GbE, 100Gb/s, QSFP28, 2m, Black, 30AWG, CA-N	AA319963		\$96.67	2	\$193.34	
APC NetShelter SX Deep Enclosure - Rack - cabinet - black - 24U - 19-inch	A7522217		\$1,129.99	1	\$1,129.99	
APC Basic Rack PDU AP9567 - 0U - 120V NEMA 5-15 Input / (14) NEMA 5-15 Output	A7541364		\$189.99	1	\$189.99	
ASUS VE248Q 24 Inch LED monitor - Widescreen Full HD Monitor	A6732050		\$136.99	3	\$410.97	
Logitech MK200 Media Keyboard and Mouse Combo	A6859396		\$24.99	3	\$74.97	
C2G 6ft Cat6 Snagless Unshielded (UTP) Ethernet Network Patch Cable - Black - patch cable - 6 ft - black	A7052140		\$5.99	17	\$101.83	
Dell C13 to C14, PDU Style, 250 V Power Cord, North America - 6.5 feet	450-ACHI		\$11.93	34	\$405.62	
32-port Mellanox Spectrum SN2700 - Switch - L3 - managed - 32 x 100 Gigabit QSFP28	A8628811		\$20,008.99	1	\$20,008.99	
Mellanox M-1 Global Support Gold Plus. 2hr committed TAC response (24x7). 3 years	A9878902		\$3,234.06	1		\$3,234.06
PowerSwitch S3048-ON			\$15,066.51	1	\$15,066.51	
Dell Networking S3048-ON, 48x 1GbE, 4x SFP+ 10GbE ports, Stacking, IO to PSU air, 1x AC PSU, DNOS 9	210-AEDM			1		
ProSupport Plus: Mission Critical 4-Hour 7x24 On-Site Service with Emergency Dispatch, Initial Year	802-7419			1		
ProSupport Plus: 7x24 HW/SW Tech Support and Assistance, 3 Year	802-7434			1		included
ProSupport Plus: Mission Critical 4-Hour 7x24 On-Site Service with Emergency Dispatch, 2 Year Extended	802-7435			1		included
HARDWARE COMPONENTS Subtotal					\$1,197,855.53	
SOFTWARE COMPONENTS						
Cloudera CDP - 3 year 24x7 support			\$40,800.00	17	\$693,600.00	
SOFTWARE COMPONENTS Subtotal					\$693,600.00	
TOTAL						\$1,891,455.53
Large Purchase Discount (35%)*						-662,009.44

Pricing: 1 = Dell; * Discount applies to all line items where Key = 1. Discount based upon total system cost as purchased by a regular customer. Audited by Doug Johnson, InfoSizing	Three-Year Cost of Ownership: \$1,229,447 HSph@3TB: 34.52 \$ / HSph@3TB: \$35,615.50
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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.

	<h1>Dell PowerEdge R6515</h1>	TPCx-HS	2.0.3
		TPC Pricing	2.6.0
		Report Date	Mar. 15, 2021

Numerical Quantities	
Performance Run – Run 1	
Scale Factor	3TB
Run Start Time	2021-02-26 12:15:04.000
Run End Time	2021-02-26 12:20:14.000
Run Elapsed Time	313.000
HSGen Start Time	2021-02-26 12:15:05.000
HSGen End Time	2021-02-26 12:16:06.000
HSGen Elapsed Time	62.323
HSSort Start Time	2021-02-26 12:16:10.000
HSSort End Time	2021-02-26 12:19:35.000
HSSort Elapsed Time	205.211
HSValidate Start Time	2021-02-26 12:19:39.000
HSValidate End Time	2021-02-26 12:20:14.000
HSValidate Elapsed Time	36.254
Repeatability Run – Run 2	
Scale Factor	3TB
Run Start Time	2021-02-26 12:25:19.000
Run End Time	2021-02-26 12:30:21.000
Run Elapsed Time	305.000
HSGen Start Time	2021-02-26 12:25:20.000
HSGen End Time	2021-02-26 12:26:21.000
HSGen Elapsed Time	62.584
HSSort Start Time	2021-02-26 12:26:25.000
HSSort End Time	2021-02-26 12:29:42.000
HSSort Elapsed Time	197.317
HSValidate Start Time	2021-02-26 12:29:46.000
HSValidate End Time	2021-02-26 12:30:21.000
HSValidate Elapsed Time	36.218



Dell PowerEdge R6515

TPCx-HS	2.0.3
TPC Pricing	2.6.0
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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 =	313
	Total Size =	30000000000
	Scale-Factor =	3

TPCx-HS Performance Metric (HSph@SF): 34.5224

Run Report for Repeatability Run – Run 2

TPCx-HS Performance Metric (HSph@SF) Report

Test Run 2 Details	Total Time =	305
	Total Size =	30000000000
	Scale-Factor =	3

TPCx-HS Performance Metric (HSph@SF): 35.4191

	Dell PowerEdge R6515	TPCx-HS	2.0.3
		TPC Pricing	2.6.0
		Report Date	Mar. 15, 2021

Revision History

Date	Edition	Description
March 15, 2021	First	Initial Publication