



## Dell PowerEdge R6525 using Exasol 6.2

TPC-H Rev. 2.18.0  
TPC-Pricing Rev. 2.4.0

Report Date  
October 22, 2019

Total System Cost

Composite Query per Hour Metric

Price / Performance

**\$ 525,893**

**7,696,073**  
QphH@3000GB

**\$ 0.07**  
\$ / QphH@3000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

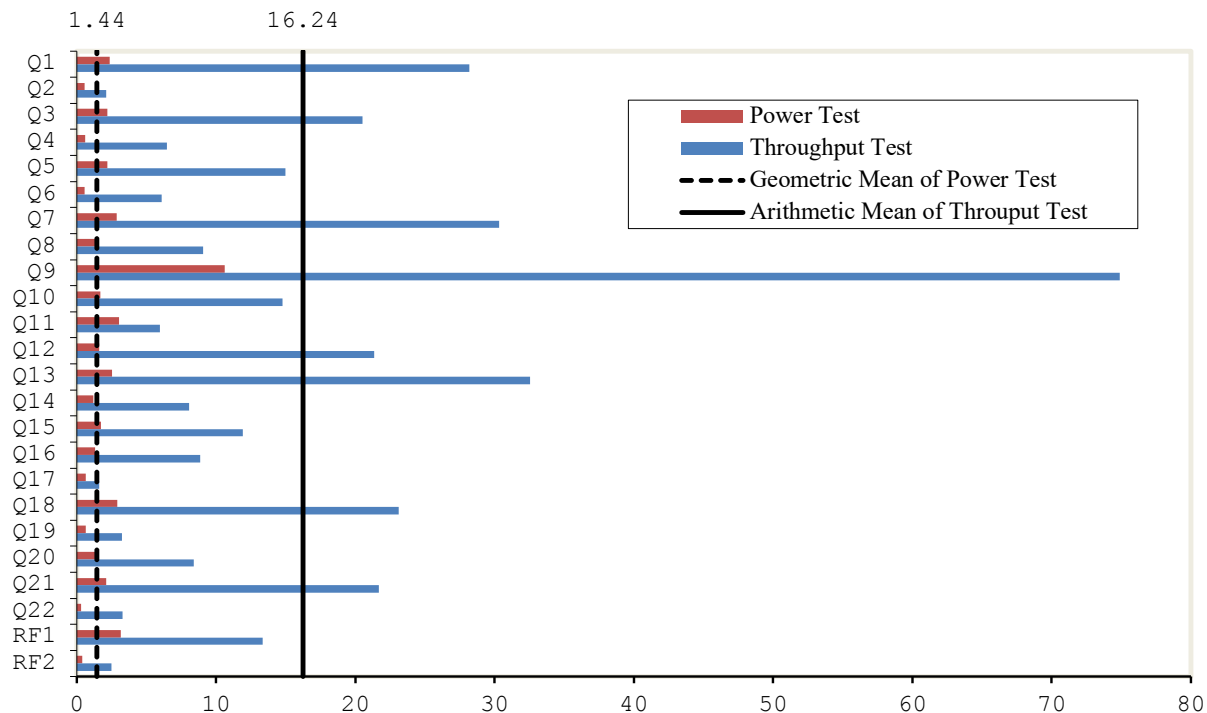
**3,000GB**

**Exasol 6.2**

**CentOS 7.6**

**None**

**October 22, 2019**



Database Load Time = 00d 00h 39m 19s  
 Load Includes Backup: N  
 Total Data Storage / Database Size = 9.16  
 Memory to Database Size Percentage = 136.6%

Storage Redundancy Levels:

Base Tables	Level Zero
Auxiliary Data Structures	Level Zero
DBMS Temporary Space	Level Zero
OS and DBMS Software	Level One

**System Configuration:**

- 8 x Dell PowerEdge R6525 Server, each with:
  - 512 GB RAM
  - 2 x AMD EPYC 7542 32-Core Processor (64 threads)
  - 2 x 240 GB M.2 sticks
  - 2 x 1600 GB SSD internal drive
  - 1 x 32 GB IDSMD (only on nodes p15 and p18)

**Total Storage:** 27,478 GiB



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Description	Part	Key	Unit Price	Qty	Ext. Price \$	3 Yr. Maint. Price \$
<b>SERVER COMPONENTS</b>						
<b>PowerEdge R6525 Server</b>			45,866.00	8	366,928.00	
PowerEdge R6525 Server	210-ATCF	1		1		
BOSS controller card + with 2 M.2 sticks 240G (RAID 1), LP	403-BCHM	1		1		
Chassis with up to 4x3.5" Drives	379-BDSZ	1		1		
SAS/SATA Backplane	379-BDSS	1		1		
PowerEdge R6525 Motherboard, with 2 x 1Gb Onboard LOM (BCM5720)	384-BCGL, 403-BCID	1		1		
No Trusted Platform Module	461-AADZ	1		1		
Chassis with up to 4 x 3.5" Hot Plug Hard Drives (2CPU & XGMI)	321-BEUI	1		1		
PowerEdge R6525 Shipping	340-CNJI	1		1		
PowerEdge R6525 Shipping Material for x4/10 Chassis DAO, 800W w/ CCC, NO BIS	340-COGL, 343-BBOL	1		1		
AMD EPYC 7542 2.90GHz, 32C/64T, 128M Cache (225W) DDR4-3200	338-BTYT	1		1		
AMD EPYC 7542 2.90GHz, 32C/64T, 128M Cache (225W) DDR4-3200	338-BTYT, 379-BDCO	1		1		
Heatsink for 2 CPU configuration (CPU greater than or equal to 180W)	412-AASH, 412-AASJ	1		1		
3200MT/s RDIMMs	370-AEVR	1		1		
Performance Optimized	370-AAIP	1		1		
32GB RDIMM, 3200MT/s, Dual Rank	370-AEVR	1		16		
C7, Unconfigured RAID for HDDs or SSDs (Mixed Drive Types Allowed)	780-BCDS	1		1		
PERC H745 for Chassis up to 4 or 8 drives	405-AAUY	1		1		
1.6TB SSD SAS MU 12Gbps 512 2.5in HP AG Drive,3.5in HYB CARR, 3 DWPD, 8760 TBW	400-AZPQ	1		2		
No Operating System	611-BBBF	1		1		
OpenManage Enterprise Advanced	528-BIYY	1		1		
iDRAC9, Enterprise X5	385-BBOT	1		1		
iDRAC,Factory Generated Password	379-BCSF	1		1		
Riser Config 2, 1 x 16 LP PCIe slot (CPU1), 2 x 16 LP PCIe slot (CPU2)	330-BBVR	1		1		
Broadcom 57414 Dual Port 10/25GbE SFP28, OCP NIC 3.0	540-BCOC	1		1		
High Performance Fan for CPU greater than or equal to 180W (2 CPU)	384-BCGS	1		1		
Dual, Hot-plug, Redundant Power Supply (1+1), 800W	450-AIQX	1		1		
NEMA 5-15P to C13 Wall Plug, 125 Volt, 15 AMP, 10 Feet (3m), Power Cord, North America	450-AALV	1		2		
No Bezel for x4 chassis	350-BBBW, 350-BBXO	1		1		
No Quick Sync	350-BBXM	1		1		
Performance BIOS Setting	384-BBBL	1		1		
UEFI BIOS Boot Mode with GPT Partition	800-BBDM	1		2		
ReadyRails™ Sliding Rails With Cable Management Arm	770-BCKT	1		1		
No Systems Documentation, No OpenManage DVD Kit	631-AACK	1		1		
Basic Next Business Day 36Months, 36 Month(s)	709-BBFM	1		1		
ProSupport and 4Hr Mission Critical, 36 Month(s)	865-BBNB	1	6,821.79	8		54,574.32
32GB IDSDM	385- BBCF385- BBOI385- BBOI	1	320.00	2		640.00
Dell EMC S5248F-ON Switch, 48x25GbE SFP28, 4x100GbE QSFP28, 2x100GbE QSFP-DD, IO to PSU, 2xPSU, OS10	210-ASQR	1	25,543.00	1	25,543.00	
OS10 Enterprise, S5248F-ON	634-BRUN	1		1		
S52XX User Manual	343-BBLP	1		1		
Power Cord, 125V, 15A, 10 Feet, NEMA 5-15/C13, Qty 2	450-AAFH, 450-AAFH	1		1		
3 Years ProSupport Plus Mission Critical 4Hr Onsite Service	818-4856, 818-4898, 818-4901, 818-4902, 951-2015, 975-3461, 997-6306	1	9,338.00	1		9,338.00
No Installation	900-9997	1		1		

Keyboard and Optical Mouse, USB, Black, English	570-AAK, 580-ADJC	1	12.00	3	36.00
Dell 24 Monitor - E2417H	E2417H	1	169.99	3	509.97
C2G 8ft Cat6a Snagless Unshielded (UTP) Network Patch Ethernet Cable	A7293807	1	11.99	10	119.90
1m (3ft) Dell DAC-Q28-100G-1M Compatible 100G QSFP28 Passive Direct Attach Copper Twinax Cable	Q28-PC01	1	29.00	20	580.00
3m (10ft) Dell DAC-Q28-4SFP28-25G-3M Compatible 100G QSFP28 to 4x25G SFP28 Passive Direct Attach Copper Breakout Cable	Q-4S28PC03	1	93.00	3	279.00
C13 to C14, PDU Style, 12 AMP, 2 Feet (.6m) Power Cord, North America	492-BBDI	1	20.00	20	400.00
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
<b>Hardware Subtotal</b>					396,340.85 63,912.32
<b>SOFTWARE</b>					
Exasol 3TB License		2	6,298.00	36	226,728.00
<b>Software Subtotal</b>					226,728.00
<b>Total</b>					<b>623,068.85 63,912.32</b>
Large Purchase Discount (35%)*					-138,719.30 -22,369.31
<b>Three-Year Cost of Ownership:</b>					<b>\$ 525,893</b>
<b>QphH@3000GB:</b>					<b>7,696,073</b>
<b>\$/QphH@3000GB:</b>					<b>\$ 0.07</b>
Price Key: 1 DELL	Waseem Raja				
	Weyman Trichel				
2 Exasol	Gunther Schweer				<a href="mailto:sales@exasol.com">sales@exasol.com</a>
* Discount applies to all line items where Key = 1. Discount based upon total system cost as purchased by a regular customer.					
Audited by Francois Raab of InfoSizing ( <a href="http://www.sizing.com">www.sizing.com</a> )					
<i>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 specifications. If you find that the stated prices are not available according to these terms please inform the TPC at <a href="mailto:pricing@tpc.org">pricing@tpc.org</a>. Thank you.</i>					



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**Numerical Quantities**

**Measurement Results**

Database Scale Factor	3,000 GB
Total Data Storage / Database Size	9.16
Percentage Memory / Database Size	136.6%
Start of Database Load	2019-09-26 13:13:05
End of Database Load	2019-09-26 13:52:24
Database Load Time	00d 00h 39m 19s
Query Streams for Throughput Test	12
TPC-H Power	7,507,768.5
TPC-H Throughput	7,889,101.0
TPC-H Composite Query-per-Hour Metric (QphH@3000GB)	7,696,073.3
Total System Price Over 3 Years	\$525,893
TPC-H Price/ Performance Metric (\$/QphH@3000GB)	\$0.07

**Measurement Interval**

Measurement Interval in Throughput Test (Ts)	361.41 seconds
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**Duration of Stream Execution**

Power Run	Seed	Query Start Time	Total Time (hh:mm:ss)	RF1 Start Time	RF2 Start Time
		Query End Time		RF1 End Time	RF2 End Time
	926135224	2019-09-26 13:52:32.99	00:00:44	2019-09-26 13:52:29.78	2019-09-26 13:53:17.33
		2019-09-26 13:53:17.30		2019-09-26 13:52:32.92	2019-09-26 13:53:17.70
Throughput Stream	Seed	Query Start Time	Total Time (hh:mm:ss)	RF1 Start Time	RF2 Start Time
		Query End Time		RF1 End Time	RF2 End Time
1	926135225	2019-09-26 13:53:18.59	00:05:54	2019-09-26 13:53:17.70	2019-09-26 13:53:24.20
		2019-09-26 13:59:12.51		2019-09-26 13:53:24.14	2019-09-26 13:53:25.76
2	926135226	2019-09-26 13:53:17.77	00:05:53	2019-09-26 13:53:25.76	2019-09-26 13:53:32.96
		2019-09-26 13:59:10.56		2019-09-26 13:53:32.96	2019-09-26 13:53:33.99
3	926135227	2019-09-26 13:53:18.56	00:06:00	2019-09-26 13:53:34.02	2019-09-26 13:53:42.50
		2019-09-26 13:59:18.33		2019-09-26 13:53:42.49	2019-09-26 13:53:45.48
4	926135228	2019-09-26 13:53:21.59	00:05:55	2019-09-26 13:53:45.49	2019-09-26 13:53:58.55
		2019-09-26 13:59:16.65		2019-09-26 13:53:58.54	2019-09-26 13:53:59.56
5	926135229	2019-09-26 13:53:19.43	00:05:59	2019-09-26 13:53:59.56	2019-09-26 13:54:07.54
		2019-09-26 13:59:18.87		2019-09-26 13:54:07.52	2019-09-26 13:54:09.95
6	926135230	2019-09-26 13:53:19.40	00:05:57	2019-09-26 13:54:09.97	2019-09-26 13:54:20.26
		2019-09-26 13:59:16.35		2019-09-26 13:54:20.24	2019-09-26 13:54:21.83
7	926135231	2019-09-26 13:53:18.56	00:05:55	2019-09-26 13:54:21.84	2019-09-26 13:54:31.08
		2019-09-26 13:59:14.01		2019-09-26 13:54:31.06	2019-09-26 13:54:33.98
8	926135232	2019-09-26 13:53:19.39	00:06:00	2019-09-26 13:54:33.99	2019-09-26 13:54:47.72
		2019-09-26 13:59:19.11		2019-09-26 13:54:47.68	2019-09-26 13:54:52.01
9	926135233	2019-09-26 13:53:19.40	00:05:58	2019-09-26 13:54:52.05	2019-09-26 13:55:10.99
		2019-09-26 13:59:17.75		2019-09-26 13:55:10.96	2019-09-26 13:55:14.18
10	926135234	2019-09-26 13:53:18.56	00:06:00	2019-09-26 13:55:14.20	2019-09-26 13:55:34.70
		2019-09-26 13:59:18.28		2019-09-26 13:55:34.67	2019-09-26 13:55:38.51
11	926135235	2019-09-26 13:53:20.61	00:05:57	2019-09-26 13:55:38.55	2019-09-26 13:56:05.16
		2019-09-26 13:59:17.90		2019-09-26 13:56:05.12	2019-09-26 13:56:07.83
12	926135236	2019-09-26 13:53:18.81	00:06:00	2019-09-26 13:56:07.86	2019-09-26 13:56:25.72
		2019-09-26 13:59:18.57		2019-09-26 13:56:25.67	2019-09-26 13:56:28.33



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**TPC-H Timing Intervals (in seconds)**

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
0	2.37	0.57	2.19	0.62	2.21	0.57	2.88	1.31	10.63	1.67	3.05	1.60
1	27.48	2.18	20.07	5.83	14.34	6.07	30.52	7.65	74.57	13.48	5.67	22.29
2	26.06	2.40	20.75	6.40	15.86	1.54	31.77	9.04	72.26	16.66	5.96	21.19
3	27.52	1.98	18.01	7.88	14.18	9.54	29.85	9.79	77.95	13.68	6.47	20.09
4	28.99	1.96	21.49	6.48	16.34	5.91	29.97	9.75	76.69	13.95	5.59	20.13
5	27.76	1.82	21.20	5.69	14.47	6.01	30.55	8.09	68.04	14.34	7.22	21.81
6	28.34	1.94	21.55	7.06	15.33	6.44	31.73	8.80	78.01	15.83	6.35	19.60
7	27.83	2.25	19.18	6.67	14.90	5.62	31.05	8.90	77.24	14.37	6.00	20.51
8	29.04	1.88	19.44	5.73	15.44	5.98	32.54	9.13	72.37	14.52	4.55	23.17
9	29.75	1.93	20.87	7.44	15.05	6.29	28.81	10.90	75.22	16.52	6.59	21.32
10	28.35	2.56	21.64	6.35	11.14	6.67	30.95	8.27	74.40	14.39	5.32	22.15
11	28.27	1.77	21.72	6.33	17.06	6.33	27.80	9.34	72.31	15.23	5.65	22.24
12	28.91	2.46	20.02	5.55	15.51	6.67	28.25	9.07	79.79	14.05	6.22	21.82
Qi Min	2.37	0.57	2.19	0.62	2.21	0.57	2.88	1.31	10.63	1.67	3.05	1.60
Qi Avg	26.21	1.98	19.09	6.00	13.99	5.66	28.21	8.46	69.96	13.75	5.74	19.84
Qi Max	29.75	2.56	21.72	7.88	17.06	9.54	32.54	10.90	79.79	16.66	7.22	23.17

Stream ID	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
0	2.52	1.17	1.73	1.31	0.64	2.91	0.63	1.34	2.09	0.32	3.14	0.37
1	33.66	7.55	13.36	9.89	2.40	21.01	2.99	8.10	21.86	2.96	6.43	1.55
2	31.31	8.72	13.21	8.98	1.44	23.60	3.16	7.89	21.30	3.28	7.20	1.02
3	32.64	8.30	10.25	9.05	1.14	23.58	3.40	8.38	22.59	3.47	8.47	2.98
4	32.83	7.67	11.79	9.26	1.40	22.26	3.08	5.96	20.56	2.98	13.05	1.00
5	37.16	8.11	15.85	8.63	1.59	23.59	4.01	7.20	22.83	3.46	7.96	2.41
6	32.04	8.55	10.99	8.72	1.40	21.33	2.66	7.00	19.87	3.41	10.27	1.57
7	31.33	8.15	10.31	8.96	1.57	20.57	3.21	12.34	21.42	3.05	9.22	2.90
8	32.61	8.56	13.52	9.46	1.64	23.12	4.00	8.42	21.17	3.42	13.69	4.29
9	28.53	7.27	12.68	5.76	1.49	26.11	3.23	8.53	20.44	3.63	18.91	3.19
10	33.56	7.89	11.45	8.59	1.80	24.77	3.33	8.81	24.27	3.06	20.46	3.81
11	31.58	7.90	12.37	8.56	1.68	24.01	2.76	9.04	21.90	3.43	26.56	2.67
12	33.04	8.07	7.44	10.30	1.87	23.20	3.22	8.93	22.10	3.26	17.82	2.61
Qi Min	2.52	1.17	1.73	1.31	0.64	2.91	0.63	1.34	2.09	0.32	3.14	0.37
Qi Avg	30.22	7.53	11.15	8.27	1.54	21.54	3.05	7.84	20.18	3.06	12.55	2.34
Qi Max	37.16	8.72	15.85	10.30	2.40	26.11	4.01	12.34	24.27	3.63	26.56	4.29