



**Hewlett Packard
Enterprise**

**HPE ProLiant DL325
Gen10
using Exasol 6.2**

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

Report Date
August 7, 2019

Total System Cost

Composite Query per Hour Metric

Price / Performance

\$210,505

3,635,443.7
QphH@1000GB

\$ 0.06
\$ / QphH@1000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

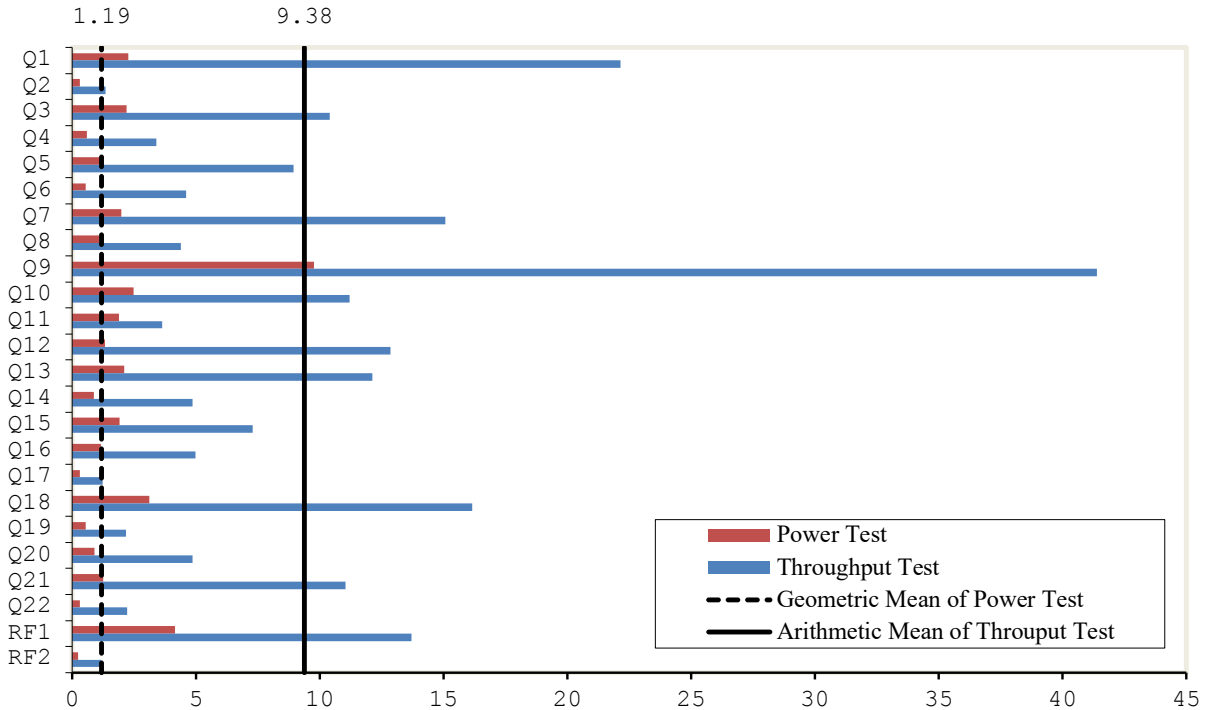
1,000GB

Exasol 6.2

CentOS 7.6

None

August 26, 2019



Database Load Time = 00d 00h 47m 41s
 Load Includes Backup: N
 Total Data Storage / Database Size = 5.96
 Memory to Database Size Percentage = 102.4%

Storage Redundancy Levels:

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

System Configuration:

4 x HPE ProLiant DL325 Gen10 Server, each with:
 256 GB RAM
 1 x AMD EPYC™ 7702 64-Core Processor (128 threads)
 1 x 1600 GB NVMe internal drive

Total Storage: 5,960 GiB



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Description	Part Number	Key	Unit Price \$	Qty	Ext. Price \$	3 Yr. Maint. Price \$
SERVER COMPONENTS						
HPE DL325 Gen10 8SFF CTO Server	P04654-B21	1	1,350.00	4	5,400.00	
HPE DL325 Gen10 8SFF CTO Server, EPYC 1x7702, data nodes		1	11,839.00	4	47,356.00	
HPE 32GB 2Rx4 PC4-2933-R , data nodes	P00924-B21	1	1,170.00	32	37,440.00	
HPE 800W CS Platinum Plus AC Power Supply	865414-B21	1	379.00	4	1,516.00	
HPE DL325 Gen10 8SFF (NVMe backplane) CTO Server	P04662-B21	1	1,699.00	4	6,796.00	
HPE 1.6 TB NVMe, MO001600KWVNB	P10222-B21	1	3,120.00	4	12,480.00	
HPE Ethernet 10/25G Network Adapter 631FLR-SFP28	817709-B21	1	749.00	4	2,996.00	
HPE 3Y FC 24x7 DL325 Gen10 SVC	HB4G8E	1	1,355.00	4		5,420.00
HPE iLO Adv incl 3yr TS U E-LTU	E6U64ABE	1	469.00	4		1,876.00
HP V194 18.5" HD 1366x768 LED Monitor (1 + 2 spare)	V5E94A6#ABA	3	80.95	3	243.00	
HP PS/2 Keyboard And Mouse Bundle (1 + 2 spare)	H3C53AA#ABA	3	24.95	3	75.00	
OTHER HARDWARE COMPONENTS						
HPE 1620-24G Switch + 2 spares	JG913A	1	299.00	3	897.00	
5ft (1.5m) Cat6 Snagless Unshielded (UTP) PVC CM 8+2 spares	C6-UTPSGPVCBE	2	2.00	6	12.00	
HPE 5945 48SFP28 8QSFP28 Switch	JQ074A	1	30,970.00	1	30,970.00	
HPE 25Gb SFP28 to SFP28 3m DAC 8+2 spares	844477-B21	1	221.99	6	1,331.94	
HPE 3Y FC 24x7 FF 5945 Switch SVC	HB4S3E	1	8,003.00	1		8,003.00
HPE 42U 600x1075mm Adv G2 Kit Pllt Rack	P9K07A	1	1,179.00	1	1,179.00	
HPE 24A High Voltage Core Only Corded PDU + 2 spares	252663-D74	1	259.00	3	777.00	
Hardware Subtotal					149,468.94	15,299.00
SOFTWARE						
Exasol 6.2 - Exasol 1TB Subscription ¹⁾		4	2,099.00	36	75,564.00	
Software Subtotal					75,564.00	
Total					225,032.94	15,299.00
Large Purchase Hardware Discount (20%) ²⁾					- 29,827.79	

Three-Year Cost of Ownership: \$210,505
QphH@1000GB: 3,635,443.7
\$/QphH@1000GB: \$ 0.06

Price Key: 1 HPE
 2 fs.com
 3 hp.factoryoutletstore.com
 4 Exasol

sales@exasol.com

¹⁾ Includes software (DB & OS) support 24x7

²⁾ All discounts are based on US list prices and for similar quantities and configurations. A 20% discount was based on the overall specific components pricing from vendor 1 in this single quotation. Discounts for similarly sized configurations will be similar to those quoted here, but may vary based on the components in the configuration.

Audited by Francois Raab of InfoSizing (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 specifications. 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

Measurement Results

Database Scale Factor	1,000 GB
Total Data Storage / Database Size	5.96
Percentage Memory / Database Size	102.4%
Start of Database Load	2019-07-22 12:42:35
End of Database Load	2019-07-22 13:30:16
Database Load Time	00d 00h 47m 41s
Query Streams for Throughput Test	12
TPC-H Power	3,035,584.1
TPC-H Throughput	4,353,841.2
TPC-H Composite Query-per-Hour Metric (QphH@1000GB)	3,635,443.7
Total System Price Over 3 Years	\$210,505
TPC-H Price/ Performance Metric (\$/QphH@1000GB)	\$ 0.06

Measurement Interval

Measurement Interval in Throughput Test (Ts) 218.29 seconds

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
722133016	722133016	2019-07-22 13:34:31.37	00:00:38	2019-07-22 13:34:27.14	2019-07-22 13:35:09.53
		2019-07-22 13:35:09.52		2019-07-22 13:34:31.29	2019-07-22 13:35:09.78
Throughput Stream	Seed	Query Start Time Query End Time	Total Time (hh:mm:ss)	RF1 Start Time RF1 End Time	RF2 Start Time RF2 End Time
1	722133017	2019-07-22 13:35:09.85	00:03:25	2019-07-22 13:35:09.78	2019-07-22 13:35:20.99
		2019-07-22 13:38:34.76		2019-07-22 13:35:20.98	2019-07-22 13:35:21.79
2	722133018	2019-07-22 13:35:09.86	00:03:24	2019-07-22 13:35:21.79	2019-07-22 13:35:35.79
		2019-07-22 13:38:34.26		2019-07-22 13:35:35.79	2019-07-22 13:35:36.35
3	722133019	2019-07-22 13:35:09.85	00:03:38	2019-07-22 13:35:36.36	2019-07-22 13:35:46.87
		2019-07-22 13:38:48.07		2019-07-22 13:35:46.86	2019-07-22 13:35:48.14
4	722133020	2019-07-22 13:35:09.88	00:03:25	2019-07-22 13:35:48.15	2019-07-22 13:36:00.49
		2019-07-22 13:38:34.96		2019-07-22 13:36:00.47	2019-07-22 13:36:01.66
5	722133021	2019-07-22 13:35:09.88	00:03:26	2019-07-22 13:36:01.68	2019-07-22 13:36:15.99
		2019-07-22 13:38:36.06		2019-07-22 13:36:15.99	2019-07-22 13:36:17.31
6	722133022	2019-07-22 13:35:09.86	00:03:26	2019-07-22 13:36:17.33	2019-07-22 13:36:29.36
		2019-07-22 13:38:35.77		2019-07-22 13:36:29.35	2019-07-22 13:36:30.56
7	722133023	2019-07-22 13:35:09.87	00:03:25	2019-07-22 13:36:30.56	2019-07-22 13:36:42.60
		2019-07-22 13:38:35.09		2019-07-22 13:36:42.59	2019-07-22 13:36:44.46
8	722133024	2019-07-22 13:35:09.90	00:03:26	2019-07-22 13:36:44.47	2019-07-22 13:36:56.40
		2019-07-22 13:38:35.63		2019-07-22 13:36:56.39	2019-07-22 13:36:57.36
9	722133025	2019-07-22 13:35:09.88	00:03:26	2019-07-22 13:36:57.36	2019-07-22 13:37:12.98
		2019-07-22 13:38:35.65		2019-07-22 13:37:12.98	2019-07-22 13:37:13.91
10	722133026	2019-07-22 13:35:09.89	00:03:25	2019-07-22 13:37:13.92	2019-07-22 13:37:34.20
		2019-07-22 13:38:35.00		2019-07-22 13:37:34.18	2019-07-22 13:37:35.67
11	722133027	2019-07-22 13:35:09.89	00:03:26	2019-07-22 13:37:35.69	2019-07-22 13:37:48.76
		2019-07-22 13:38:35.87		2019-07-22 13:37:48.75	2019-07-22 13:37:50.00
12	722133028	2019-07-22 13:35:09.90	00:03:24	2019-07-22 13:37:50.01	2019-07-22 13:38:07.14
		2019-07-22 13:38:33.43		2019-07-22 13:38:07.13	2019-07-22 13:38:08.56



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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	2.26	0.30	2.19	0.60	1.22	0.55	1.99	1.08	9.77	2.48	1.88	1.32
1	20.20	1.44	11.15	2.71	8.47	4.72	15.23	4.04	40.39	11.04	3.84	14.02
2	21.57	1.38	10.57	3.66	9.41	4.13	14.82	4.06	37.98	11.26	3.66	13.91
3	28.97	0.31	2.11	4.66	10.85	6.26	19.11	8.07	57.22	16.87	2.05	1.37
4	21.82	1.46	10.62	3.51	9.89	4.51	14.72	3.73	37.98	10.89	3.59	14.02
5	21.54	1.58	10.61	3.43	9.37	4.38	15.52	3.98	38.34	10.64	3.74	14.07
6	22.00	1.49	10.97	3.20	8.94	4.59	14.94	3.74	42.86	10.13	3.65	14.20
7	21.83	1.41	11.03	3.44	8.42	4.32	15.40	4.11	41.24	10.58	3.86	12.70
8	21.92	1.32	12.25	3.23	8.29	4.80	14.54	3.86	39.45	10.41	3.34	13.88
9	21.02	1.46	12.09	3.24	8.36	4.76	15.70	4.98	40.07	10.66	4.10	14.03
10	21.79	1.47	11.83	2.90	7.39	4.17	14.45	3.95	41.17	10.20	3.81	14.28
11	21.77	1.49	10.98	3.33	8.71	4.17	12.05	4.10	41.21	11.10	3.84	13.88
12	21.27	1.40	10.69	3.51	9.26	4.51	14.42	3.96	38.83	10.78	4.13	13.88
Qi Min	2.26	0.30	2.11	0.60	1.22	0.55	1.99	1.08	9.77	2.48	1.88	1.32
Qi Avg	20.61	1.27	9.78	3.19	8.35	4.30	14.07	4.13	38.96	10.54	3.50	11.97
Qi Max	28.97	1.58	12.25	4.66	10.85	6.26	19.11	8.07	57.22	16.87	4.13	14.28

Stream ID	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
0	2.11	0.88	1.91	1.15	0.31	3.11	0.55	0.90	1.25	0.32	4.15	0.24
1	12.65	4.89	6.90	5.27	0.99	14.40	2.03	5.26	13.19	2.07	11.19	0.80
2	13.20	4.68	7.27	5.37	0.99	15.17	2.16	5.09	12.00	2.07	13.99	0.56
3	2.25	8.15	7.73	1.27	2.24	32.08	0.61	0.89	1.29	3.84	10.51	1.27
4	13.32	4.42	7.48	5.09	1.10	15.40	3.30	4.55	11.94	1.75	12.32	1.17
5	13.17	4.44	7.06	5.47	0.89	15.31	1.93	5.45	13.25	2.04	14.30	1.32
6	13.19	4.59	7.13	5.49	0.90	14.84	2.53	5.01	9.42	2.11	12.02	1.20
7	13.46	4.82	7.16	5.78	0.89	14.28	1.93	5.25	11.23	2.12	12.02	1.87
8	13.20	4.66	7.29	5.58	1.14	13.45	3.46	5.58	11.95	2.16	11.92	0.95
9	12.75	3.95	7.78	4.32	1.01	14.83	1.96	5.26	11.31	2.13	15.61	0.93
10	12.59	4.68	7.60	5.19	1.63	14.87	2.13	5.28	11.62	2.11	20.26	1.47
11	12.82	4.56	6.90	5.57	1.91	14.54	2.32	5.32	13.31	2.11	13.06	1.24
12	12.93	4.58	7.24	5.36	0.95	14.71	1.65	5.35	11.92	2.21	17.12	1.42
Qi Min	2.11	0.88	1.91	1.15	0.31	3.11	0.55	0.89	1.25	0.32	4.15	0.24
Qi Avg	11.36	4.56	6.88	4.69	1.15	15.15	2.04	4.55	10.28	2.08	12.96	1.11
Qi Max	13.46	8.15	7.78	5.78	2.24	32.08	3.46	5.58	13.31	3.84	20.26	1.87