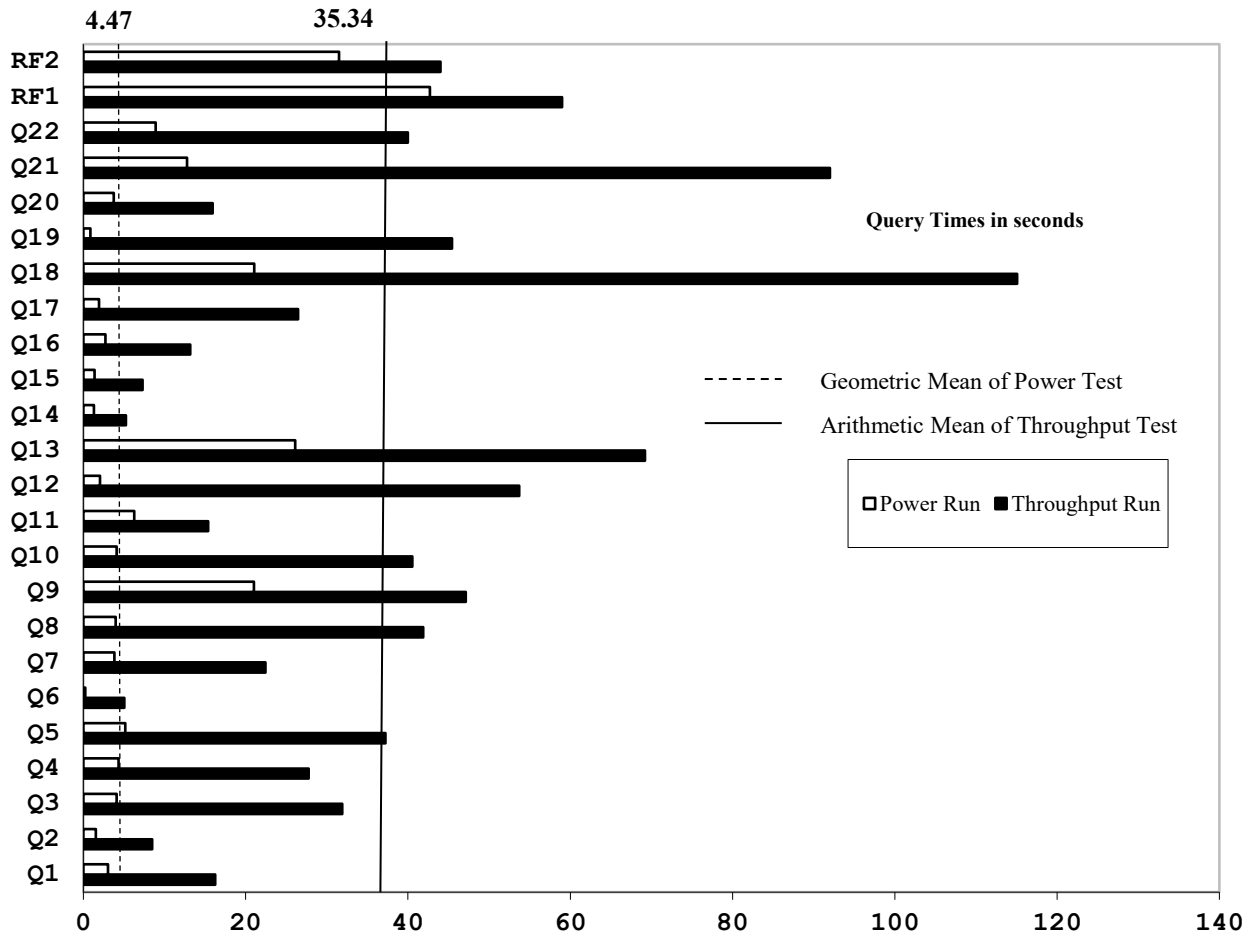
 Hewlett Packard Enterprise		HPE ProLiant DL325 Gen10		TPC-H Rev. 2.18.0 TPC Pricing Rev. 2.4.0	
Total System Cost		Composite Query per Hour Rating		Report Date: August 7, 2019	
\$252,286 USD		743,750.6 QpH @ 1,000GB		\$0.34 USD \$/ QpH @ 1,000GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date	
1000GB	Microsoft® SQL Server 2017 Enterprise Edition	Red Hat® Enterprise Linux® 8	None	August 26, 2019	



Database Load Time = 00d 6h 56m 29s	Storage Redundancy Level	
Load included backup: Y	Base Tables and Auxiliary Data Structures	No RAID
Total Data Storage / Database Size = 12.33	DBMS Temporary Space	No RAID
Memory/Database Size = 51.2%	OS and DBMS Software	RAID 1

System Components	System Total	Per Node
Nodes:	1	n.a.
AMD® EPYC ROME 7502P @ 2.50GHz:	1	1
Cores/Threads:	32/64	32/64
Memory:	512GB	512GB
Network Interfaces (on-board GigE):	1	1
(E208i-a embedded)	1	1
1.6TB NVMe Drives	8	n.a.
Disk Drives (240GB 6G SATA SSD):	2	n.a.
Total Storage:	16,393.8 GB	n.a.



HPE ProLiant DL325 Gen10

TPC-H Rev. 2.18.0
TPC Pricing Rev. 2.4.0

Report Date:
August 7, 2019

Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
Server Hardware						
HPE DL325 Gen10 NVMe SFF CTO Server	1	P04662-B21	\$1,600	1	\$1,600	
HPE DL325 Gen10 7502P AMD Kit	1	P16639-L21	\$3,459	1	\$3,459	
HPE 64GB 2Rx4 DDR4-2933 R Smart Memory Kit	1	P19045-B21	\$2,129	8	\$17,032	
HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	1	865414-B21	\$379	1	\$379	
HPE USB US Keyboard/Mouse Kit	1	631341-B21	\$29	1	\$29	
Add to Rack 48U 600mmx1075mm G2 Advanced Pallet	1	P9K19A	\$1,499	1	\$1,499	
HPE C13-JIS C8303 JP 100V 12Amp 2.0m Power Cord	1	AF572A	\$49	1	\$49	
HPE 3Y Foundation Care 24x7 SVC	1	H7J34A3	\$2,448	1		\$2,448
Subtotal					\$24,047	\$2,448
Storage						
HPE 1.6TB NVMe x4 Lanes Mixed Use SFF (2.5in) SCN 3yr Wty Digitally Signed Firmware SSD	1	P10222-B21	\$3,049	8	\$24,392	
HPE Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular LH Controller	1	869079-B21	\$299	1	\$299	
HPE 240GB SATA 6G Read Intensive SFF (2.5in) SC 3yr Wty Digitally Signed Firmware SSD	1	P05924-B21	\$409	2	\$818	
HPE 1U Gen10 2SFF SAS/SATA FIO Enablement Kit without Cables	1	881179-B21	\$59	1	\$59	
HPE DL325 Gen10 2SFF Smart Array SAS FIO Cable Kit	1	P05036-B21	\$30	1	\$30	
HPE DL325G10 Standard Riser	1	StandardDL325G10Riser		1		
Subtotal					\$25,598	\$0
Other						
Other HP 23 Inch Monitor 3 HP	3	HP 23f	\$199	1	\$199	
Subtotal					\$199	\$0
Server Software						
SQL Server 2017 Enterprise Edition for Linux (2 core license, 32 cores)	2	N/A	\$13,472.00	16	\$215,560	Included
Microsoft Problem Resolution Services	2	N/A	\$259.00	1		\$259.00
RHEL Svr 2 Sckt/2 Gst 3yr 24x7 E-LTU	1	G3J30AAE	\$3,702.00	1	\$3,702	
Subtotal					\$219,262	\$259
Total Extended Price					\$269,106	\$2,707
Total Discounts					\$18,671	\$856
Price Key: 1 - HPE , 2 - Microsoft, 3 - Hewlett Packard Inc. Audited by Francois Raab of InfoSizing (www.sizing.com)					Grand Total	\$250,435
All discounts are based on US list prices and for similar quantities and configurations. A 35% 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.					3 year cost of ownership USD:	\$252,286
					QpH @ 1000GB:	743,750.6
					\$ USD/QpH @ 1000GB	\$0.34
Sales contact: HPE WW Headquarters, 3000 Hanover St., Palo Alto, CA 94304-1185 (855)472-5233 / (800)786-7967 / (888)269-4073 (US)						
Microsoft Corporation, One Microsoft Way, Redmond, WA 98052-6399 (425) 882 8080						
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 at pricing@tpc.org. Thank you.						



**Hewlett Packard
Enterprise**

**HPE ProLiant DL325
Gen10**

TPC-H Rev. 2.18.0
TPC Pricing Rev. 2.4.0

Report Date:
August 7, 2019

Numerical Quantities

Measurement Results

Database Scale Factor	1,000
Total Data Storage / Database Size	12.33
Percentage Memory / Database Size	51.2%
Start of Database Load	2019-07-26 18:00:57
End of Database Load	2019-07-27 04:42:38
Database Load Time	00d 6h 56m 29s
Query Streams for Throughput Test	7
TPC-H Power	805,960.6
TPC-H Throughput	686,342.5
TPC-H Composite Query-per-Hour (QphH@1000GB)	743,750.6
Total System Price over 3 Years (\$ USD)	\$252,286
TPC-H Price/Performance Metric (\$ USD / QphH@1000GB)	\$0.34

Measurement Interval

Measurement Interval in Throughput Test **807.76 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
	727044238	2019-07-27 04:49:09	00:02:21	2019-07-27 04:48:26	2019-07-27 04:51:30
		2019-07-27 04:51:30		2019-07-27 04:49:08	2019-07-27 04:52:01
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	727044239	2019-07-27 04:52:01	00:13:16	2019-07-27 04:52:01	2019-07-27 04:53:01
		2019-07-27 05:05:17		2019-07-27 04:53:01	2019-07-27 04:53:45
2	727044240	2019-07-27 04:52:01	00:12:18	2019-07-27 04:53:45	2019-07-27 04:54:44
		2019-07-27 05:04:19		2019-07-27 04:54:44	2019-07-27 04:55:24
3	727044241	2019-07-27 04:52:01	00:12:44	2019-07-27 04:55:24	2019-07-27 04:56:25
		2019-07-27 05:04:45		2019-07-27 04:56:25	2019-07-27 04:57:09
4	727044242	2019-07-27 04:52:01	00:13:29	2019-07-27 04:57:10	2019-07-27 04:58:09
		2019-07-27 05:05:30		2019-07-27 04:58:09	2019-07-27 04:58:54
5	727044243	2019-07-27 04:52:01	00:13:18	2019-07-27 04:58:55	2019-07-27 04:59:51
		2019-07-27 05:05:19		2019-07-27 04:59:51	2019-07-27 05:00:33
6	727044244	2019-07-27 04:52:01	00:12:52	2019-07-27 05:00:34	2019-07-27 05:01:35
		2019-07-27 05:04:53		2019-07-27 05:01:35	2019-07-27 05:02:20
7	727044245	2019-07-27 04:52:01	00:12:54	2019-07-27 05:02:21	2019-07-27 05:03:19
		2019-07-27 05:04:55		2019-07-27 05:03:19	2019-07-27 05:04:08

TPC-H Timing Intervals (in seconds):

Query	Stream 0	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5	Stream 6	Stream 7	Min Qi	Max Qi	Avg. Qi
Q1	3.05	6.14	22.18	17.14	5.88	30.30	24.38	7.64	3.05	30.30	14.59
Q2	1.55	5.17	7.44	13.97	7.38	8.24	10.02	7.19	1.55	13.97	7.62
Q3	4.09	18.72	39.43	14.85	4.16	67.06	12.75	66.25	4.09	67.06	28.41
Q4	4.35	12.21	43.60	6.52	30.22	19.21	51.23	31.38	4.35	51.23	24.84
Q5	5.16	34.87	11.46	14.88	34.54	81.48	46.10	37.10	5.16	81.48	33.20
Q6	0.22	6.72	0.38	4.92	6.36	0.78	5.50	10.52	0.22	10.52	4.43
Q7	3.83	13.42	15.35	41.57	16.03	40.66	18.39	11.55	3.83	41.57	20.10
Q8	3.97	19.14	63.75	41.87	17.02	21.08	62.64	67.73	3.97	67.73	37.15
Q9	21.00	27.58	51.06	71.79	44.81	20.24	59.76	54.68	20.24	71.79	43.87
Q10	4.08	43.26	45.63	42.56	65.57	3.89	45.01	37.90	3.89	65.57	35.99
Q11	6.27	23.88	12.69	11.78	12.41	10.80	23.88	12.08	6.27	23.88	14.22
Q12	2.05	78.42	69.18	85.77	25.36	61.96	19.57	35.74	2.05	85.77	47.26
Q13	26.11	120.41	77.01	81.55	49.62	29.80	46.62	79.42	26.11	120.41	63.82
Q14	1.28	1.95	2.69	2.78	4.75	5.20	13.83	5.42	1.28	13.83	4.74
Q15	1.38	6.88	9.21	6.91	6.35	9.56	5.06	7.17	1.38	9.56	6.57
Q16	2.73	12.88	9.55	7.20	17.75	21.82	15.16	7.83	2.73	21.82	11.87
Q17	1.91	31.93	35.63	28.22	53.46	17.21	5.24	13.49	1.91	53.46	23.39
Q18	21.07	114.96	72.25	41.24	210.43	123.07	134.16	109.47	21.07	210.43	103.33
Q19	0.86	36.66	15.46	87.56	54.09	36.77	42.52	45.06	0.86	87.56	39.87
Q20	3.74	13.55	27.63	23.21	3.58	11.92	15.75	15.91	3.58	27.63	14.41
Q21	12.77	138.01	73.76	58.03	92.91	119.05	86.98	75.14	12.77	138.01	82.08
Q22	8.89	28.32	31.58	58.39	44.95	56.62	26.26	33.85	8.89	58.39	36.11
RF1	42.71	59.12	58.91	60.53	58.62	55.85	61.57	58.29	42.71	61.57	56.95
RF2	31.49	43.51	39.39	44.44	45.29	42.13	45.15	48.23	31.49	48.23	42.45