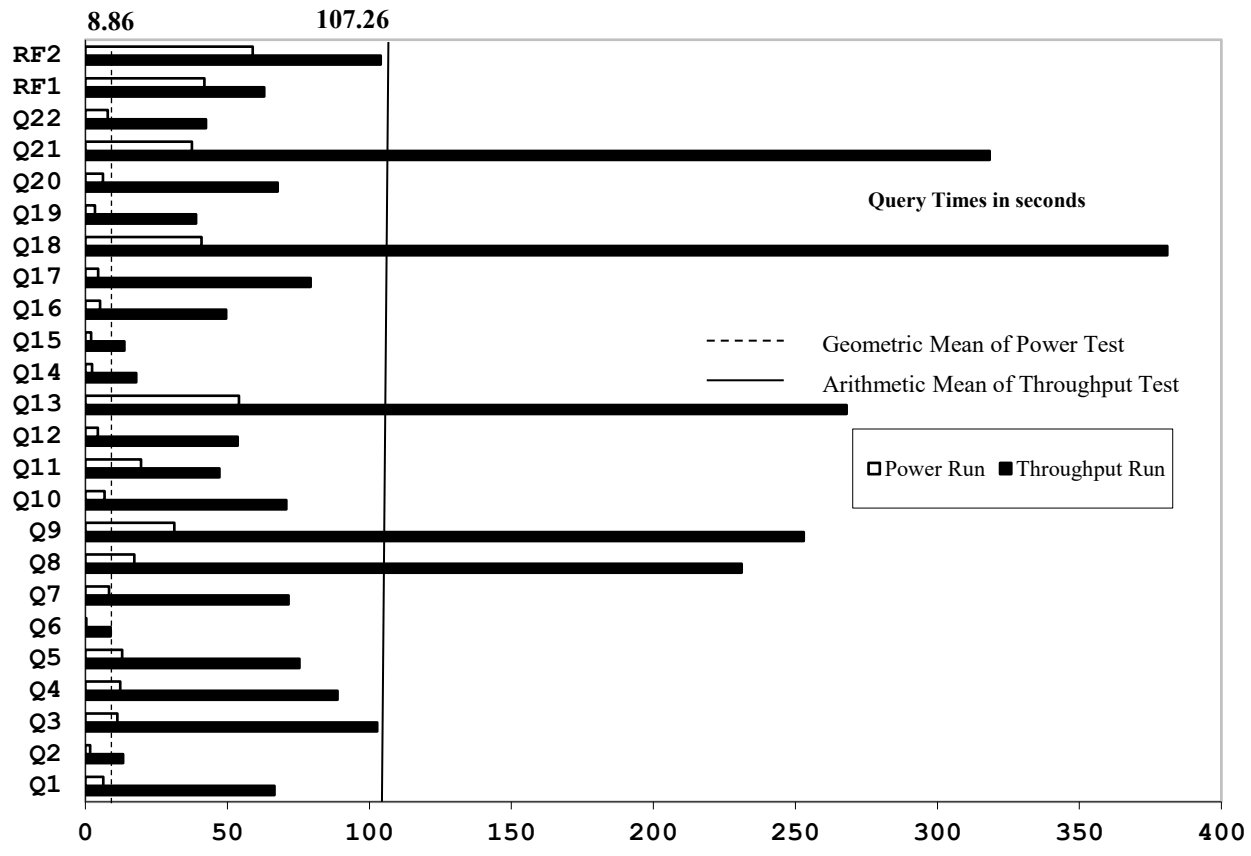
 Hewlett Packard Enterprise		HPE ProLiant DL385 Gen10 Plus		TPC-H Rev. 2.18.0 TPC Pricing Rev. 2.5.0	
Total System Cost		Composite Query per Hour Rating		Report Date: June 1, 2020	
\$292,774 USD		976,350.7 QpH @ 3,000GB		\$0.30 USD \$/ QpH @ 3,000GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date	
3000GB	Microsoft® SQL Server 2019 Enterprise Edition	Red Hat® Enterprise Linux® 8	None	June 22, 2020	



Database Load Time = 00d 8h 50m 34s	Storage Redundancy Level	
Load included backup: Y	Base Tables and Auxiliary Data Structures	No RAID
Total Data Storage / Database Size = 6.68	DBMS Temporary Space	No RAID
Memory/Database Size = 68.3%	OS and DBMS Software	RAID 1

System Components	System Total
Nodes:	1
AMD® EPYC ROME 7F52 @ 3.5 GHz:	2
Cores/Threads:	32/64
Memory:	2,048 GiB
1.6TB NVMe Drives	6
1.92TB NVMe Drives	6
Disk Drives (240GB 6G SATA SSD):	2
Total Storage:	20,046 GB



HPE ProLiant DL385 Gen10 plus

TPC-H Rev. 2.18.0
TPC Pricing Rev. 2.5.0

Report Date: June 1, 2020

Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
Server Hardware						
HPE DL385 Gen10 Plus CTO Mod-X 8SFF Svr	1	P14278-B21	\$1,559	1	\$1,559	
HPE DL385 Gen10+ AMD EPYC 7F52 FIO Kit	1	P28785-L21	\$5,289	1	\$5,289	
HPE DL385 Gen10+ AMD EPYC 7F52 Kit	1	P28785-B21	\$5,289	1	\$5,289	
HPE 128GB 4Rx4 PC4-3200AA-L Smart	1	P07652-B21	\$3,599	16	\$57,584	
HPE 800W Flex Slot Platinum Hot Plug LowHalogen PowerSupplyKit	1	865414-B21	\$360	2	\$720	
HPE USB US Keyboard/Mouse Kit	1	631341-B21	\$29	1	\$29	
HPE 10GbE 2P SFP+ QL41132 OCP3 Adptr	1	P08452-B21	\$635	1	\$635	
Add to Rack 48U 600mmx1075mm G2 Advanced Pallet	1	P9K19A	\$2,075	1	\$2,075	
HPE C13 - JIS C8303 JP 100V 12Amp 2.0m Power Cord	1	AF572A	\$49	1	\$49	
HPE 3Y Foundation Care 24x7 SVC	1	H7J34A3	\$2,648	1		\$2,648
		Subtotal			\$73,229	\$2,648
Storage						
HPE 1.92TB NVMe x4 Read Intensive SFF (2.5in) SC U.3 SSD	1	P16501-B21	\$2,350	6	\$14,100	
HPE 1.6TB NVMe Mixed Use SFF (2.5in) SC 3yr Wty U.3 SSD	1	P16497-B21	\$2,350	6	\$14,100	
HPE Smart Array E208i-p SR Gen10 12G SAS PCIe Plug-in Controller	1	804394-B21	\$285	1	\$285	
HPE 240GB SATA 6G Read Intensive SFF SC 3yr Wty DSF SSD	1	P04556-B21	\$380	2	\$760	
HPE DL38X Gen10 Plus Maximum Performance Fan Kit	1	P14608-B21	\$249	1	\$249	
HPE DL385 Gen10 Plus 8SFF NVMe/SAS Smart Carrier Box 1-3 Drive Cage Kit	1	P14578-B21	\$499	2	\$998	
HPE DL38X Gen10 Plus 12Gb SAS Expander Card	1	P23388-B21	\$699	1	\$699	
HPE DL38X Gen10 Plus 16NVMe CPU1/2 Cable Kit	1	P22835-B21	\$69	1	\$69	
HPE DL385 Gen10 Plus 16NVMe Balanced Support FIO Bundle	1	P22751-B21	\$0	1	\$0	
HPE DL38X Gen10 Plus 2U Cable Management Arm for Rail Kit	1	P22020-B21	\$65	1	\$65	
HPE DL38X Gen10 Plus 2U SFF Easy Install Rail Kit	1	P22018-B21	\$100	1	\$100	
HPE DL38X Gen10+ AROC-NVMe Kit	1	P14602-B21	\$299	1	\$299	
HPE DL325G10 Standard Riser	1	standardDL325G10Riser		1		
		Subtotal			\$31,441	\$0
Other						
Other HP 23 Inch Monitor 3 HP	3	HP 23f	\$199	1	\$199	
		Subtotal			\$199	\$0
Server Software						
SQL Server 2019 Enterprise Edition for Linux (2 core license, 32 cores)	2	N/A	\$13,748.00	16	\$219,968	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			\$223,670	\$259
Total Extended Price					\$328,822	\$2,907
Total Discounts					\$38,029	\$926
Grand Total					\$290,793	\$1,981
Price Key: 1 - HPE , 2 - Microsoft, 3 - Hewlett Packard Inc. Audited by Francois Raab of InfoSizing (www.sizing.com)						
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: \$292,774	
					QpH @ 3000GB: 976,350.7	
					\$ USD/QpH @ 3000GB \$0.30	
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.						

Numerical Quantities

Measurement Results

Database Scale Factor	3,000
Total Data Storage / Database Size	6.68
Percentage Memory / Database Size	68.3%
Start of Database Load	05/13/2020 23:23:25
End of Database Load	05/14/2020 08:35:18
Database Load Time	08h 50m 34s
Query Streams for Throughput Test	8
TPC-H Power	1,219,048.4
TPC-H Throughput	781,971.2
TPC-H Composite Query-per-Hour (QphH@3000GB)	976,350.7
Total System Price over 3 Years (\$ USD)	\$292,774
TPC-H Price/Performance Metric (\$ USD / QphH@3000GB)	\$0.30

Measurement Interval

Measurement Interval in Throughput Test **2,430.78 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
	514083518	2020-05-14 09:29:25	00:04:57	2020-05-14 09:28:43	2020-05-14 09:34:22
		2020-05-14 09:34:22		2020-05-14 09:29:25	2020-05-14 09:35:21
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	514083519	2020-05-14 09:35:20	00:36:34	2020-05-14 09:35:20	2020-05-14 09:36:23
		2020-05-14 10:11:54		2020-05-14 09:36:23	2020-05-14 09:37:43
2	514083520	2020-05-14 09:35:20	00:39:09	2020-05-14 09:37:44	2020-05-14 09:38:46
		2020-05-14 10:14:29		2020-05-14 09:38:46	2020-05-14 09:40:37
3	514083521	2020-05-14 09:35:20	00:39:54	2020-05-14 09:40:37	2020-05-14 09:41:38
		2020-05-14 10:15:14		2020-05-14 09:41:38	2020-05-14 09:43:29
4	514083522	2020-05-14 09:35:21	00:40:18	2020-05-14 09:43:29	2020-05-14 09:44:30
		2020-05-14 10:15:39		2020-05-14 09:44:30	2020-05-14 09:46:22
5	514083523	2020-05-14 09:35:21	00:38:11	2020-05-14 09:46:22	2020-05-14 09:47:22
		2020-05-14 10:13:32		2020-05-14 09:47:21	2020-05-14 09:49:08
6	514083524	2020-05-14 09:35:21	00:39:52	2020-05-14 09:49:08	2020-05-14 09:50:12
		2020-05-14 10:15:13		2020-05-14 09:50:12	2020-05-14 09:51:33
7	514083525	2020-05-14 09:35:21	00:40:16	2020-05-14 09:51:34	2020-05-14 09:52:34
		2020-05-14 10:15:37		2020-05-14 09:52:34	2020-05-14 09:54:29
8	514083526	2020-05-14 09:35:21	00:40:31	2020-05-14 09:54:29	2020-05-14 09:55:44
		2020-05-14 10:15:52		2020-05-14 09:55:44	2020-05-14 09:57:40

TPC-H Timing Intervals (in seconds):

Query	Stream 0	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5	Stream 6	Stream 7	Stream 8	Min Qi	Max Qi	Avg. Qi
Q1	6.24	64.35	41.68	69.26	54.65	52.85	152.90	57.20	39.47	6.24	59.84	152.90
Q2	1.67	13.10	13.36	20.60	9.85	13.19	13.91	8.44	13.63	1.67	11.97	20.60
Q3	11.28	88.83	190.31	41.05	30.46	49.01	61.67	145.87	214.56	11.28	92.56	214.56
Q4	12.30	71.00	49.71	72.42	63.67	80.65	83.61	243.79	45.74	12.30	80.32	243.79
Q5	12.89	58.67	58.67	91.30	57.88	60.87	55.65	87.14	132.97	12.89	68.45	132.97
Q6	0.31	7.35	4.13	2.91	6.44	34.72	3.14	4.77	7.28	0.31	7.89	34.72
Q7	8.38	59.60	69.31	90.65	60.57	81.59	99.52	67.64	43.66	8.38	64.55	99.52
Q8	17.19	229.57	123.88	231.00	257.84	267.88	269.68	225.60	242.80	17.19	207.27	269.68
Q9	31.30	158.26	313.55	139.21	340.00	249.80	347.58	340.85	134.60	31.30	228.35	347.58
Q10	6.74	62.51	69.04	69.96	64.96	64.49	53.09	83.70	98.30	6.74	63.64	98.30
Q11	19.58	44.27	29.07	49.95	36.79	125.35	35.82	31.10	24.97	19.58	44.10	125.35
Q12	4.33	49.29	73.81	40.09	39.40	61.84	69.10	28.66	66.57	4.33	48.12	73.81
Q13	54.04	196.73	346.77	286.70	304.09	285.07	273.62	271.65	179.81	54.04	244.28	346.77
Q14	2.30	26.27	18.74	18.91	10.78	22.35	17.24	10.19	18.57	2.30	16.15	26.27
Q15	2.02	12.61	13.41	17.27	17.28	12.99	14.81	9.39	12.49	2.02	12.47	17.28
Q16	5.19	39.68	74.06	117.14	28.93	38.65	29.86	25.43	42.69	5.19	44.63	117.14
Q17	4.53	120.88	43.55	112.39	62.93	51.73	64.51	59.23	119.27	4.53	71.00	120.88
Q18	40.84	290.95	274.84	495.65	504.44	255.74	355.68	338.52	531.60	40.84	343.14	531.60
Q19	3.38	40.80	28.94	30.15	47.37	51.26	52.87	43.69	17.14	3.38	35.07	52.87
Q20	6.14	190.08	46.80	39.15	12.64	76.57	53.56	61.04	62.24	6.14	60.91	190.08
Q21	37.54	323.05	441.79	289.97	377.01	322.85	233.97	241.33	316.89	37.54	287.16	441.79
Q22	7.92	44.71	22.14	66.53	29.74	31.29	49.71	30.02	65.20	7.92	38.58	66.53
RF1	41.92	61.42	62.33	61.01	60.89	59.11	63.83	60.29	74.98	41.92	60.64	74.98
RF2	58.89	80.51	110.76	110.34	112.16	106.28	81.21	114.82	115.39	58.89	98.93	115.39