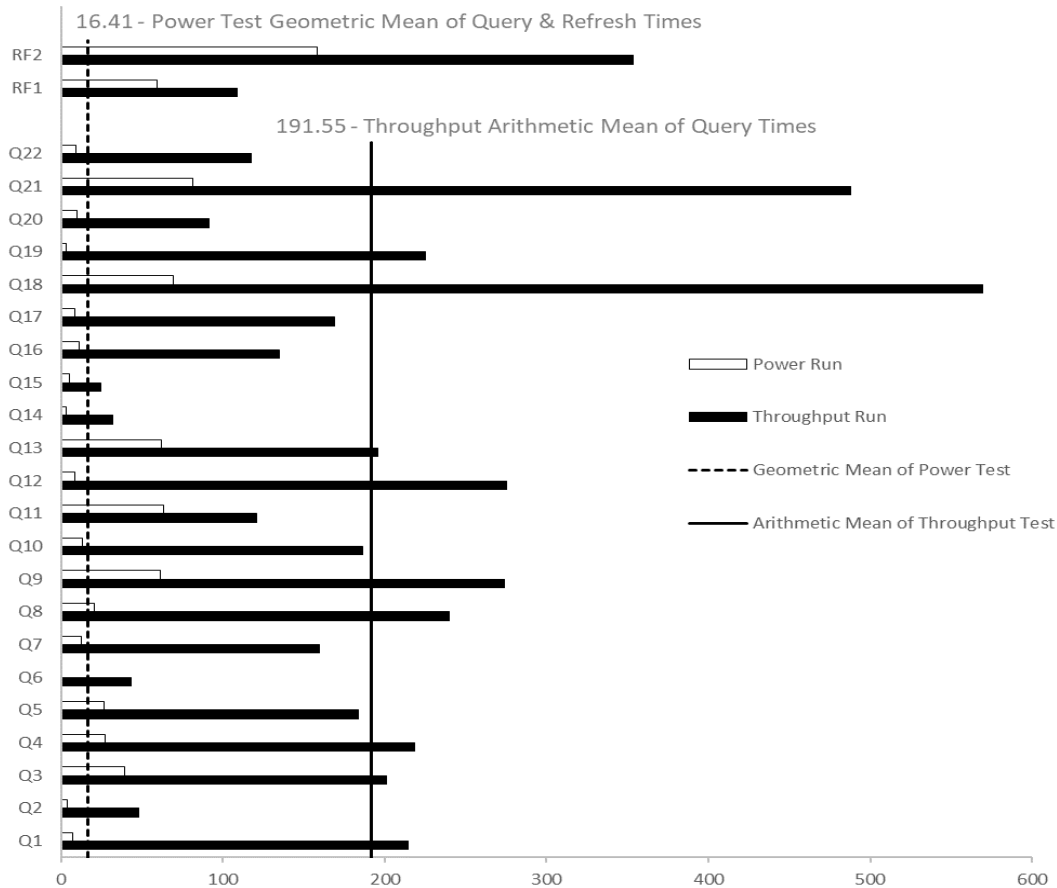
 Hewlett Packard Enterprise		HPE ProLiant DL385 Gen10 Plus V2		TPC-H Rev. 3.0.0 TPC Pricing Rev. 2.7.0	
				Report Date: March 15, 2021	
Total System Cost		Composite Query per Hour Rating		Price/Performance	
\$1,046,089 USD		1,883,497 QphH @ 10,000GB		\$555.40 USD \$ / kQphH @ 10,000GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date	
10,000GB	Microsoft® SQL Server 2019 Enterprise Edition	Red Hat® Enterprise Linux® 8	None	April 19, 2021	



Database Load Time = 01d 0h 2m 11s	Storage Redundancy Level	
Load included backup: Y	Base Tables and Auxiliary Data Structures	No RAID
Total Data Storage / Database Size = 2.58	DBMS Temporary Space	No RAID
Memory/Database Size = 41%	OS and DBMS Software	RAID 1

System Components	System Total
Nodes:	1
AMD® EPYC MILAN 7763 @ 2.45GHz:	2
Cores/Threads:	128/256
Memory:	4,096 GiB
1.6TB NVMe Drives	14
Disk Drives (800GB SAS SSD)	6
Disk Drives (240GB 6G SATA SSD)	2
Total Storage:	25,779.01 GiB



HPE ProLiant DL385 Gen10 Plus V2

TPC-H Rev. 3.0.0
TPC Pricing Rev. 2.7.0

Report Date: March 15, 2021

Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
Server Hardware						
HPE DL385 G10+ v2 8SFF CTO Svr	1	P38411-B21	\$1,599	1	\$1,599	
AMD EPYC 7763 CPU for HPE	1	P38696-B21	\$15,997	2	\$31,994	
HPE DL38X Gen10+ High Perf Heat Sink Kit	1	P14610-B21	\$252	1	\$252	
HPE DL38X Gen10+ Max Perf Fan Kit	1	P14608-B21	\$274	1	\$274	
HPE 128GB 4Rx4 PC4-3200AA-L Smart	1	P07652-B21	\$5,122	32	\$163,904	
HPE 1600W FS Plat Ht Plg LH Pwr Sply Kit	1	830272-B21	\$455	2	\$910	
HPE USB US Keyboard/Mouse Kit	1	631341-B21	\$32	3	\$96	
MLX MCX562A 10/25GbE 2p SFP28 OCP3 Adptr	1	P10112-B21	\$725	1	\$725	
HPE DL385 Gen10+ OCP Upg Cbl Kit	1	P14603-B21	\$159	1	\$159	
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	\$54	1	\$54	
HPE 3 Year Total Care Essential for DL385 Gen10 Plus v2	1			1		\$2,648
Subtotal					\$202,042	\$2,648
Storage						
HPE 1.6TB NVMe MU SFF BC U.3 PM1735 SSD	1	P40570-B21	\$2,474	12	\$29,688	
HPE 1.6TB NVMe MU SFF BC U.3 PE8030 SSD	1	P31191-B21	\$2,086	2	\$4,172	
HPE 800GB SAS MU SFF BC PM6 SSD	1	P40475-B21	\$1,581	6	\$9,486	
HPE Smart Array E208i-p SR Gen10 Ctrlr	1	804394-B21	\$379	1	\$379	
HPE 240GB SATA RI SFF BC MV SSD	1	P40496-B21	\$367	2	\$734	
HPE DL300 Gen10+ 2U 8SFF x4Tmode U.3 Kit	1	P26931-B21	\$499	2	\$998	
HPE DL385 G10+ v2 16NVMe U.3 Bal FIO Kit	1	P42082-B21	\$0	1	\$0	
HPE DL38X Gen10 Plus 16NVMe CPU1/2 Cable Kit	1	P22835-B21	\$69	1	\$69	
HPE DL38X Gen10 Plus 2U Cable Management Arm for Rail Kit	1	P22020-B21	\$72	1	\$72	
HPE DL38X Gen10 Plus 2U SFF Easy Install Rail Kit	1	P22018-B21	\$110	1	\$110	
HPE DL38X Gen10+ AROC-NVMe Kit	1	P14602-B21	\$299	1	\$299	
HPE DL385G10 Standard Riser	1	standardDL325G10Riser		1		
Subtotal					\$46,007	\$0
Other						
Other HP 23 Inch Monitor 3 HP	3	HP 23f	\$199	3	\$597	
Subtotal					\$597	\$0
Software Components						
SQL Server 2019 Enterprise Edition for Linux (2 core license, 64 cores)	2	N/A	\$13,748	64	\$879,872	
Microsoft Problem Resolution Services	2	N/A	\$259	1		\$259
RHEL Svr 2 Sckt/2 Gst 3yr 24x7 E-LTU	1	G3J30AAE	\$3,702	1	\$3,702	
Subtotal					\$883,574	\$259
Total Extended Price					\$1,132,220	\$2,907
Total Discounts					\$88,112	\$926
Price Key: 1 - HPE , 2 - Microsoft, 3 - Hewlett Packard Inc.						
Audited by Doug Johnson of InfoSizing (www.sizing.com)		Grand Total				
					\$1,044,009.00	\$1,981
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:			\$1,046,089	
		QpH @ 10,000GB :			1,883,497.4	
		\$ USD/kQpH @ 10,000GB			\$555.40	
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	10,000
Total Data Storage / Database Size	2.58
Percentage Memory / Database Size	41%
Start of Database Load	07-02-2021 09:48:07
End of Database Load	08-02-2021 10:11:55
Database Load Time	01d 00h 2m 11s
Query Streams for Throughput Test	9
TPC-H Power	2,194,252.9
TPC-H Throughput	1,616,751.8
TPC-H Composite Query-per-Hour (QphH@10,000GB)	1,883,497.4
Total System Price over 3 Years (\$ USD)	\$1,046,089
TPC-H Price/Performance Metric (\$ USD / kQphH@10,000GB)	\$555.40

Measurement Interval

Measurement Interval in Throughput Test **4,408.8 seconds**

Duration of Stream Execution

Power Run	Seed	Query Start Time	Total Time	RF1 Start Time	RF2 Start Time
		Query End Time	(hh:mm:ss)	RF1 End Time	RF2 End Time
	208101155	2021-02-08 11:43:53	00:09:10	2021-02-08 11:42:53	2021-02-08 11:53:03
		2021-02-08 11:53:03		2021-02-08 11:43:53	2021-02-08 11:55:41
Throughput Stream	Seed	Query Start Time	Total Time	RF1 Start Time	RF2 Start Time
		Query End Time	(hh:mm:ss)	RF1 End Time	RF2 End Time
1	208101156	2021-02-08 11:55:41	01:09:41	2021-02-08 11:55:41	2021-02-08 11:57:26
		2021-02-08 13:05:22		2021-02-08 11:57:26	2021-02-08 12:03:28
2	208101157	2021-02-08 11:55:41	01:05:04	2021-02-08 12:03:29	2021-02-08 12:05:36
		2021-02-08 13:00:45		2021-02-08 12:05:36	2021-02-08 12:12:18
3	208101158	2021-02-08 11:55:41	01:13:29	2021-02-08 12:12:18	2021-02-08 12:13:52
		2021-02-08 13:09:10		2021-02-08 12:13:52	2021-02-08 12:19:35
4	208101159	2021-02-08 11:55:41	01:08:46	2021-02-08 12:19:36	2021-02-08 12:21:18
		2021-02-08 13:04:27		2021-02-08 12:21:18	2021-02-08 12:27:44
5	208101160	2021-02-08 11:55:41	01:12:09	2021-02-08 12:27:44	2021-02-08 12:29:40
		2021-02-08 13:07:50		2021-02-08 12:29:40	2021-02-08 12:35:05
6	208101161	2021-02-08 11:55:41	01:13:29	2021-02-08 12:35:06	2021-02-08 12:36:35
		2021-02-08 13:09:10		2021-02-08 12:36:35	2021-02-08 12:42:10
7	208101162	2021-02-08 11:55:41	01:13:06	2021-02-08 12:42:10	2021-02-08 12:43:48
		2021-02-08 13:08:47		2021-02-08 12:43:48	2021-02-08 12:49:06
8	208101163	2021-02-08 11:55:41	01:11:46	2021-02-08 12:49:07	2021-02-08 12:50:44
		2021-02-08 13:07:27		2021-02-08 12:50:44	2021-02-08 12:57:11
9	208101164	2021-02-08 11:55:41	01:04:44	2021-02-08 12:57:11	2021-02-08 12:59:44
		2021-02-08 13:00:25		2021-02-08 12:59:44	2021-02-08 13:05:06

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	Stream 9	Min Qi	Max Qi	Avg. Qi
Q1	7.66	106.02	111.67	275.43	214.60	208.13	81.76	272.28	562.84	98.89	7.66	193.93	562.84
Q2	4.06	26.43	47.70	25.10	114.35	42.55	27.96	45.60	25.30	75.82	4.06	43.49	114.35
Q3	39.43	268.28	137.63	102.66	71.37	295.73	559.43	93.61	230.21	49.43	39.43	184.78	559.43
Q4	27.57	140.15	62.87	372.15	219.81	225.88	125.72	382.01	203.16	235.72	27.57	199.50	382.01
Q5	26.63	251.60	172.21	136.24	185.83	280.00	90.81	225.38	137.11	175.14	26.63	168.10	280.00
Q6	0.92	30.88	30.55	66.81	54.23	34.19	31.29	56.48	50.16	37.49	0.92	39.30	66.81
Q7	12.58	145.24	29.00	229.71	119.16	202.08	387.42	121.53	45.91	159.95	12.58	145.26	387.42
Q8	20.44	278.61	299.89	190.19	122.97	398.62	160.81	245.99	273.10	191.94	20.44	218.26	398.62
Q9	61.67	291.33	286.73	312.75	202.19	128.50	363.68	251.96	333.93	292.34	61.67	252.51	363.68
Q10	13.22	184.01	174.12	224.22	170.06	74.57	224.38	327.80	189.37	107.25	13.22	168.90	327.80
Q11	63.39	116.32	110.91	87.84	106.20	144.43	144.93	145.66	92.69	138.72	63.39	115.11	145.66
Q12	8.41	263.56	64.48	110.24	435.74	387.62	246.37	212.25	350.29	406.42	8.41	248.54	435.74
Q13	62.29	259.91	159.57	98.89	229.68	166.01	114.30	165.48	134.66	435.46	62.29	182.63	435.46
Q14	3.47	65.73	17.50	30.35	18.14	28.07	73.43	13.33	8.06	34.16	3.47	29.22	73.43
Q15	5.22	26.50	9.39	18.75	18.88	30.44	23.65	30.58	36.82	26.71	5.22	22.69	36.82
Q16	11.16	144.49	384.84	30.33	164.84	44.35	168.01	22.61	95.28	162.09	11.16	122.80	384.84
Q17	8.42	82.54	154.43	153.65	200.11	110.39	361.27	151.18	143.91	162.20	8.42	152.81	361.27
Q18	69.26	617.81	522.34	877.91	419.72	586.93	535.86	705.64	516.80	342.90	69.26	519.52	877.91
Q19	3.03	217.92	287.95	236.61	193.54	224.30	200.36	251.52	205.81	210.83	3.03	203.19	287.95
Q20	10.05	110.42	76.37	114.24	78.95	101.30	97.02	88.19	70.93	83.84	10.05	83.13	114.24
Q21	81.40	521.89	580.98	670.84	512.31	547.43	342.66	370.62	533.05	313.73	81.40	447.49	670.84
Q22	9.16	30.88	182.00	43.85	272.64	67.07	47.32	205.08	65.60	142.15	9.16	106.58	272.64
RF1	59.26	104.80	127.80	93.17	102.56	116.14	89.65	97.64	96.94	152.41	59.26	104.04	152.41
RF2	158.18	361.84	401.94	343.72	385.64	325.02	334.85	318.42	387.00	322.10	158.18	333.87	401.94