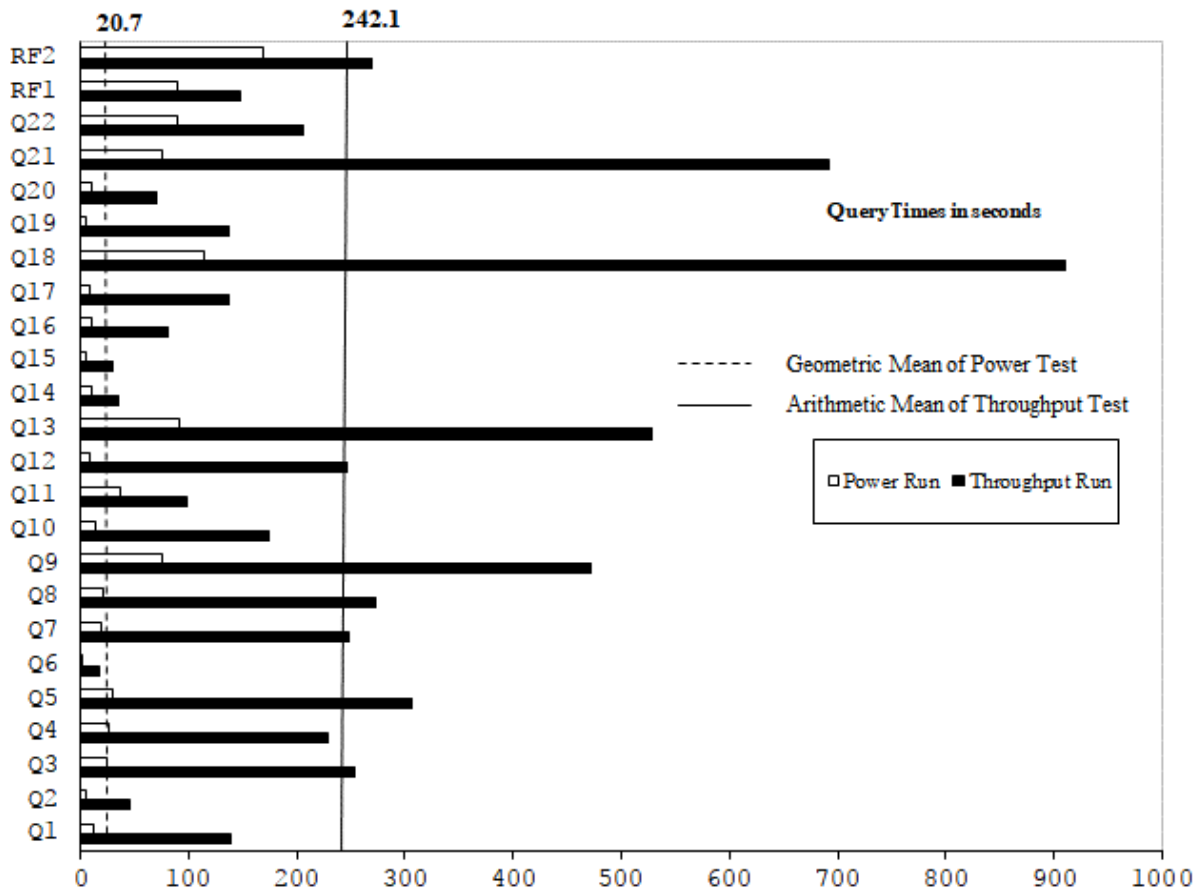
 Hewlett Packard Enterprise		HPE ProLiant DL580 Gen10		TPC-H Rev. 2.17.3 TPC Pricing Rev. 2.1.1	
Total System Cost		Composite Query per Hour Rating		Report Date: October 30, 2017	
\$1,397,556 USD		1,479,748.8 QpH @ 10,000GB		\$0.95 USD \$/ QpH @10,000GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date	
10000GB	Microsoft® SQL Server 2017 Enterprise Edition	Microsoft® Windows Server 2016 Standard Edition	None	Now	



Database Load Time = 00d 6h 46m 32s	Storage Redundancy Level	
Load included backup: Y	Base Tables and Auxiliary Data Structures	No RAID
Total Data Storage / Database Size = 2.72	DBMS Temporary Space	No RAID
Memory/Database Size = 61.4%	OS and DBMS Software	RAID 1
System Components System Total Per Node		
Nodes:	1	n.a.
Intel(R) Xeon(R) Platinum 8180M @ 2.50GHz:	4	4
Cores/Threads:	112/224	112/224
Memory:	6,144GB	6,144GB
Network Interfaces (on-board GigE):	1	1
(P408e-p HBA):	7	7
Storage Shelves D3700:	13	13
Storage Subsystem Disk Drives (400GB 12G SAS SSD):	73	n.a.
Total Storage:	27,201 GB	n.a.

Hewlett Packard Enterprise	HPE ProLiant DL580 Gen10		TPC-H Rev. 2.17.3 TPC Pricing Rev. 2.1.1			
			Report Date: October 30, 2017			
Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
Server Hardware						
HPE DL580 Gen10 8SFF CTO Server (Customer to Order)	1	869854-B21	\$6,199	1	\$6,199	
HPE DL580 Gen10 Intel® Xeon® Platinum 8180M (2.50GHz/28-core) Kit	1	878159-B21	\$22,299	1	\$22,299	
HPE DL580 Gen10 Intel® Xeon® Platinum 8180M (2.50GHz/28-core) FIO Kit	1	878159-L21	\$22,299	3	\$66,897	
HPE 128GB 8Rx4 PC4-2666V-L Smart Kit	1	815102-B21	\$13,229	48	\$634,992	
HPE DL Gen10 x16 x16 GPU Rsr Kit	1	826704-B21	\$129	1	\$129	
HPE DL38X Gen10 12Gb SAS Expander	1	870549-B21	\$699	1	\$699	
HPE DL38X Gen10 High Perf Fan	1	867810-B21	\$239	1	\$239	
HPE 800W FS Univ Ht Plg LH Pwr Sply Kit	1	865428-B21	\$429	2	\$858	
HPE 3Y FC 24x7 DL580 Gen10 SVC	1	H9FW8E	\$3,546	1		\$3,546
HP 17" FlatPanel Monitor	1	GV537A8	\$130	1	\$130	
HP PS/2 Keyboard And Mouse Bundle	1	RC464AA	\$39	1	\$39	
			Subtotal		\$732,481	\$3,546
Storage						
HPE Universal Rack 11642 1075mm Shock Rack	1	H6J66A	\$1,699	1	\$1,699	
HPE 24A High Voltage Core Only Corded PDU	1	252663-D74	\$259	2	\$518	
HPE StorageWorks D3700 Disk Enclosure 3yr warranty	1	QW967A	\$3,399	13	\$44,187	
HPE StorageWorks D3700 Disk Enclosure (10% Spares)	1	QW967A	\$3,399	2	\$6,798	
HPE 400GB 12G SAS ME 2.5in SC EM SSD 3yr warranty	1	872374-B21	\$1,399	73	\$102,127	
HPE 400GB 12G SAS ME 2.5in SC EM SSD (10% Spares)	1	872374-B21	\$1,399	8	\$11,192	
HPE Smart Array P408e-p SR Gen10 Controller	1	804405-B21	\$899	7	\$6,293	
HPE Smart Array P408e-p SR Gen10 Controller (10% spares)	1	804405-B21	\$899	2	\$1,798	
			Subtotal		\$174,612	\$0
Server Software						
SQL Server 2017 Enterprise Edition for Windows (2 core license, 28 cores)	2	N/A	\$13,472.50	56	\$754,460	Included
Windows Server 2016 Standard Edition	2	N/A	\$92.00	56	\$5,152	Included
Microsoft Problem Resolution Services	2	N/A	\$259	1		\$259
			Subtotal		\$759,612	\$259
			Total Extended Price		\$1,667,043	\$3,805
			Total Discounts		\$272,229	\$1,063
Price Key: 1 - HPE , 2 - Microsoft Audited by Francois Raab of InfoSizing (www.sizing.com)			Grand Total		\$1,394,814	\$2,742
All discounts are based on US list prices and for similar quantities and configurations. A 30% 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:		\$1,397,556	
			QpH @ 1000GB:		1,479,748.8	
			\$ USD/QpH @ 1000GB		\$0.95	
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	2.72
Percentage Memory / Database Size	61.44%
Start of Database Load	2017-10-15 15:36:18
End of Database Load	2017-10-16 05:39:16
Database Load Time	00d 06h 46m 32s
Query Streams for Throughput Test	9
TPC-H Power	1,736,242.9
TPC-H Throughput	1,261,146.5
TPC-H Composite Query-per-Hour (QphH@10000GB)	1,479,748.8
Total System Price over 3 Years (\$ USD)	\$1,397,556
TPC-H Price/Performance Metric (\$ USD / QphH@10000GB)	\$0.95

Measurement Interval

Measurement Interval in Throughput Test	5,652 seconds
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Duration of Stream Execution

Power Run	Seed	Query Start Time	Duration (sec)	RF1 Start Time	RF2 Start Time
		Query End Time		RF1 End Time	RF2 End Time
	1016053916	2017-10-16 7:35:47	696	2017-10-16 7:34:18	2017-10-16 7:47:23
		2017-10-16 7:47:23		2017-10-16 7:35:47	2017-10-16 7:50:12
Throughput Stream	Seed	Query Start Time	Duration (sec)	RF1 Start Time	RF2 Start Time
		Query End Time		RF1 End Time	RF2 End Time
1	1016053917	2017-10-16 07:50:11	5,383	2017-10-16 07:50:11	2017-10-16 07:52:42
		2017-10-16 09:19:54		2017-10-16 07:52:42	2017-10-16 07:57:39
2	1016053918	2017-10-16 07:50:11	5,040	2017-10-16 07:57:39	2017-10-16 08:00:14
		2017-10-16 09:14:11		2017-10-16 08:00:14	2017-10-16 08:05:24
3	1016053919	2017-10-16 07:50:11	5,174	2017-10-16 08:05:24	2017-10-16 08:07:50
		2017-10-16 09:16:25		2017-10-16 08:07:50	2017-10-16 08:11:37
4	1016053920	2017-10-16 07:50:11	5,574	2017-10-16 08:11:38	2017-10-16 08:14:12
		2017-10-16 09:23:05		2017-10-16 08:14:12	2017-10-16 08:18:19
5	1016053921	2017-10-16 07:50:11	5,652	2017-10-16 08:18:19	2017-10-16 08:20:45
		2017-10-16 09:24:23		2017-10-16 08:20:45	2017-10-16 08:25:01
6	1016053922	2017-10-16 07:50:11	5,441	2017-10-16 08:25:01	2017-10-16 08:27:18
		2017-10-16 09:20:52		2017-10-16 08:27:18	2017-10-16 08:32:17
7	1016053923	2017-10-16 07:50:11	5,640	2017-10-16 08:32:17	2017-10-16 08:35:07
		2017-10-16 09:24:11		2017-10-16 08:35:07	2017-10-16 08:39:31
8	1016053924	2017-10-16 07:50:11	5,583	2017-10-16 08:39:31	2017-10-16 08:41:48
		2017-10-16 09:23:14		2017-10-16 08:41:48	2017-10-16 08:46:05
9	1016053925	2017-10-16 07:50:11	4,465	2017-10-16 08:46:05	2017-10-16 08:48:15
		2017-10-16 09:04:36		2017-10-16 08:48:15	2017-10-16 08:52:35



**Hewlett Packard
Enterprise**

HPE ProLiant DL580 Gen10

TPC-H Rev. 2.17.3
TPC Pricing Rev. 2.1.1

Report Date:
October 30, 2017

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	12.3	56.8	89.4	244.5	80.0	181.3	87.1	192.6	96.9	222.5	12.3	244.5	126.3
Q2	5.9	39.4	36.9	32.4	43.4	43.7	51.5	69.8	51.7	39.1	5.9	69.8	41.4
Q3	24.7	123.3	273.3	326.7	50.0	352.7	248.4	504.7	164.7	241.1	24.7	504.7	231.0
Q4	26.3	107.1	146.2	206.4	188.6	200.6	169.5	277.3	641.7	128.2	26.3	641.7	209.2
Q5	30.6	488.7	406.2	347.3	263.3	235.9	403.5	93.8	332.2	181.0	30.6	488.7	278.3
Q6	0.9	7.0	13.5	40.3	16.7	15.5	15.7	3.4	22.1	29.8	0.9	40.3	16.5
Q7	19.1	242.1	191.9	180.3	117.0	338.0	515.9	41.2	423.9	184.9	19.1	515.9	225.4
Q8	21.7	422.3	302.7	231.5	304.4	113.8	340.9	196.9	299.5	234.9	21.7	422.3	246.9
Q9	75.3	393.2	520.7	449.9	441.3	109.8	531.0	837.7	322.2	643.6	75.3	837.7	432.5
Q10	13.1	391.1	266.4	111.6	180.5	55.7	146.0	53.6	198.1	164.7	13.1	391.1	158.1
Q11	36.3	116.4	101.7	121.6	107.5	94.0	102.9	74.5	76.6	86.6	36.3	121.6	91.8
Q12	9.4	336.3	452.9	172.1	669.8	90.0	130.5	44.3	140.2	179.3	9.4	669.8	222.5
Q13	90.6	389.5	463.1	333.3	569.2	966.5	649.4	619.4	457.3	306.1	90.6	966.5	484.4
Q14	10.1	33.7	46.1	37.1	30.9	42.3	27.4	11.1	41.4	40.7	10.1	46.1	32.1
Q15	4.6	48.1	17.6	20.3	48.9	36.0	19.1	10.3	40.0	34.0	4.6	48.9	27.9
Q16	10.2	33.9	103.0	113.4	201.3	41.0	58.8	26.5	86.7	58.3	10.2	201.3	73.3
Q17	9.4	68.9	81.7	110.7	384.3	22.3	58.8	261.0	79.0	168.9	9.4	384.3	124.5
Q18	114.4	727.5	694.9	736.7	699.2	1362.8	830.5	1226.9	1277.3	627.0	114.4	1362.8	829.7
Q19	4.4	243.0	34.8	66.3	249.3	255.6	118.5	143.0	37.1	84.2	4.4	255.6	123.6
Q20	10.7	95.1	78.4	42.4	34.8	63.0	73.3	58.0	103.1	87.9	10.7	103.1	64.7
Q21	75.9	835.2	585.2	901.4	769.2	834.7	667.8	613.0	480.2	539.1	75.9	901.4	630.2
Q22	88.9	183.5	132.7	346.2	123.1	195.5	193.2	279.9	210.1	181.5	88.9	346.2	193.5
RF1	88.8	149.9	154.5	145.7	154.6	145.7	136.7	169.5	136.8	129.6	88.8	169.5	141.2
RF2	169.0	296.7	310.2	227.5	246.3	255.8	299.0	264.4	256.3	260.4	169.0	310.2	258.6