



HP ProLiant DL580 Gen9

TPC-H Rev. 2.17.1
 TPC Pricing Rev. 1.7.0

Report Date:
 May 4, 2015

Total System Cost

Composite Query per Hour Rating

Price/Performance

\$1,099,616 USD

606,821.8
 QphH @ 10000GB

\$1.82 USD
 \$ / QphH @10000GB

Database Size

Database Manager

Operating System

Other Software

Availability Date

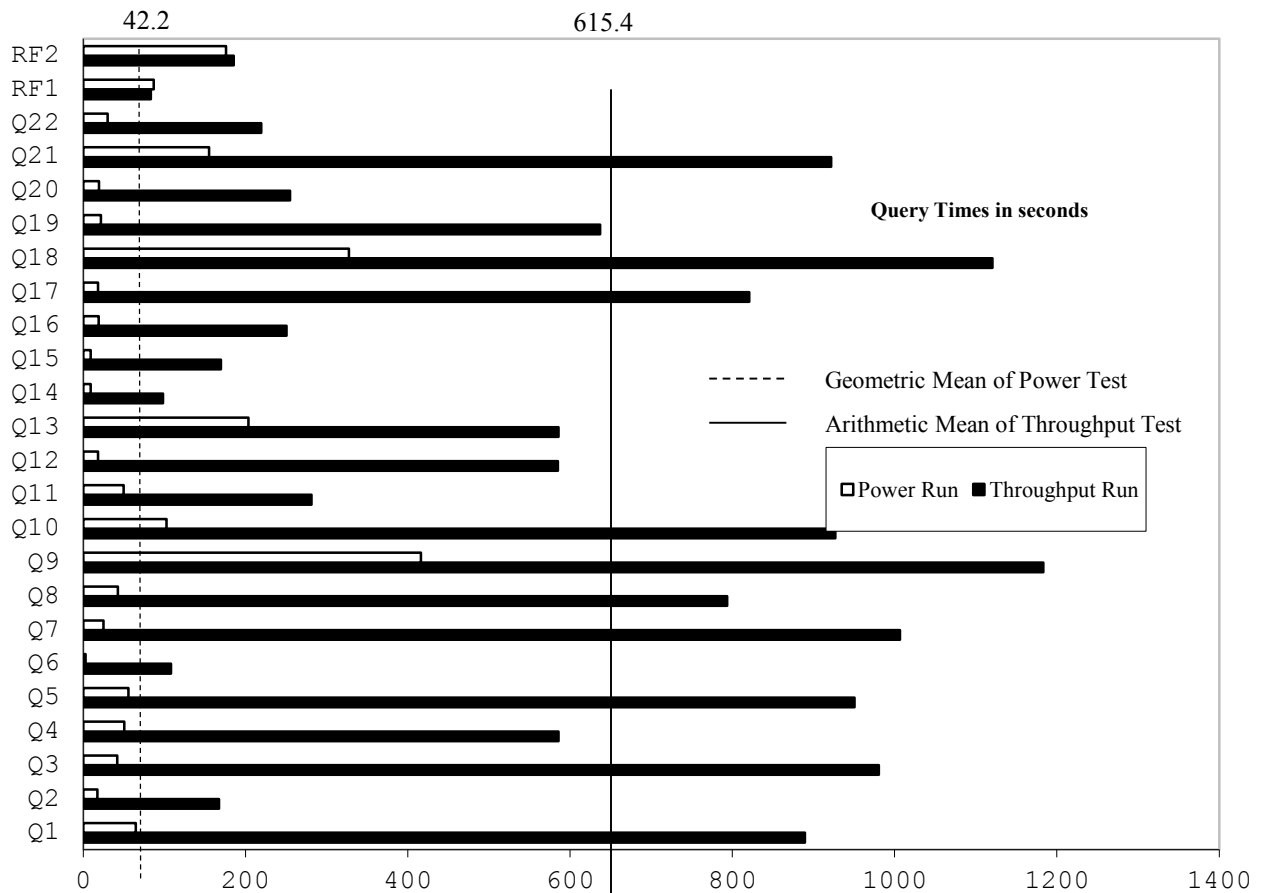
10000GB

**SQL Server 2014
 Enterprise Edition**

**Windows Server 2012
 R2 Standard Edition**

None

Now



Database Load Time = 2d 05h 21m 55s

Storage Redundancy Level

Load included backup: Y

Base Tables and Auxiliary Data Structures

0

Total Data Storage / Database Size = 8.05

DBMS Temporary Space

0

Memory/Database Size = 30.72%

OS and DBMS Software

1

System Components

System Total

Per Node

Nodes:	1	n.a.
Intel(R) Xeon(R) CPU E7-8890 v3 @ 2.50GHz:	4	4
Cores/Threads:	72/144	72/144
Memory:	3072GB	3072GB
OS Disk Drives (400GB 12G SAS SSD):	2	2
Network Interfaces (on-board GigE):	1	1
Storage Controllers (P830i HBA)/(P431 HBA):	1/7	1/7
Storage Shelves D3700:	11	11
Storage Subsystem Disk Drives (400GB 12G SAS SSD):	145	145
Storage Subsystem Disk Drives (300GB 6G SAS HDD):	100	100
Total Storage:	80,446 GB	n.a.



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Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
Server Hardware						
HP ProLiant DL580 G9 CTO Server (Customer to Order)	1	793161-B21	\$4,999	1	\$4,999	
HP DL580 Gen9 Intel® Xeon® E7-8890 v3 (2.50GHz/18cor)	1	788317-B21	\$10,579	1	\$10,579	
HP DL580 Gen9 Intel® Xeon® E7-8890 v3 (2.50GHz/18cor)	1	788317-L21	\$10,579	3	\$31,737	
HP DL580 Gen8/Gen9 12 DIMM Memory Cartridge	1	788360-B21	\$549	8	\$4,392	
HP 32GB 4Rx4 PC4-2133P-L Kit	1	726722-B21	\$899	96	\$86,304	
HP DL580 Gen8/Gen9 5 SFF Drive Backplane Kit	1	739405-B21	\$349	1	\$349	
HP SFF HDD Blank Gen8/Gen9 Kit	1	666987-B21	\$5	1	\$20	
HP 4GB FBWC FIO Kit for P-series SA	1	698537-B21	\$599	1	\$599	
HP 2GB FIO Flash Backed Write Cache	1	758836-B21	\$549	1	\$549	
HP 1200W CS Plat PL HtPlg Pwr Supply Kit	1	656364-B21	\$429	4	\$1,716	
HP 3y 4h 24x7 ProLiant D580 Gen9 FC SVC HW Support	1	U8NF6E	\$2,961	1		\$2,961
HP 17" FlatPanel Monitor	1	GV537A8	\$130	1	\$130	
HP PS/2 Keyboard And Mouse Bundle	1	RC464AA	\$39	1	\$39	
		Subtotal			\$141,413	\$2,961
Storage						
HP Universal Rack 11642 1075mm Shock Rack	1	H6J66A	\$1,699	2	\$3,398	
HP 24A High Voltage Core Only Corded PDU	1	252663-D74	\$259	2	\$518	
HP StorageWorks D3700 Disk Enclosure	1	QW967A	\$3,399	11	\$37,389	
HP StorageWorks D3700 Disk Enclosure (10% Spares)	1	QW967A	\$3,399	2	\$6,798	
HP 400GB 12G SAS ME 2.5in SC EM SSD	1	741142-B21	\$3,599	147	\$529,053	
HP 400GB 12G SAS ME 2.5in SC EM SSD (10% Spares)	1	741142-B21	\$3,599	15	\$53,985	
HP 300GB 6G SAS 15K 2.5-inch DP Enterprise 3-yr warrant	100	652611-B21	\$545	100	\$54,500	
HP 300GB 6G SAS 15K 2.5-inch DP Enterprise (10% Spares)	10	652611-B21	\$545	10	\$5,450	
HP DL580 Gen9 SAS Cable Kit	1	748916-B21	\$79	11	\$869	
HP Smart Array P431/2GB FBWC 8-Port Ext SAS	1	698531-B21	\$899	7	\$6,293	
HP Smart Array P431/2GB FBWC 8-Port (10% spares)	1	698531-B21	\$899	2	\$1,798	
HP Smart Array P830i/4GB	1	698533-B21	\$1,249	1	\$1,249	
HP Smart Array P830i/4GB (10% spares)	1	698533-B21	\$1,249	2	\$2,498	
		Subtotal			\$703,798	\$0
Server Software						
SQL Server 2014 Enterprise Edition (2 core license, 36 cores)	2	7JQ-00750	\$13,472.50	36	\$485,010	
Windows Server 2012 R2 Standard Edition (2p license)	2	P73-06284	\$735	2	\$1,470	
Windows Server 2012 R2 Client Access License	2	R18-04280	\$24.36	90	\$2,193	
Microsoft Problem Resolution Services	2	N/A	\$259	1		\$259
		Subtotal			\$488,673	\$259
		Total Extended Price			\$1,333,884	\$3,220
		Total Discounts			\$236,659	\$829
Price Key: 1 - HP , 2 - Microsoft Audited by Francois Raab of InfoSizing, Inc. (www.sizing.com)		Grand Total			\$1,097,225	\$2,391
All discounts are based on US list prices and for similar quantities and configurations. A 28% 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:				\$1,099,616
		QpH @ 1000GB:				606,821.8
		\$ USD/QpH @ 1000GB				\$1.82

Sales contact: HP WW Headquarters, 3000 Hanover St., Palo Alto, CA 94304-1185 (650) 857-1501 or H-P direct: 800-203-6748

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	8.05
Percentage Memory / Database Size	30.72
Start of Database Load	2015-04-18 06:13:45
End of Database Load	2015-04-20 11:35:40
Database Load Time	02d 05h 21m 55s
Query Streams for Throughput Test	9
TPC-H Power	853,940.3
TPC-H Throughput	431,216.0
TPC-H Composite Query-per-Hour (QphH@1000GB)	606,821.8
Total System Price over 3 Years (\$ USD)	\$1,099,616
TPC-H Price/Performance Metric (\$ USD / QphH@1000GB)	\$1.82

Measurement Interval

Measurement Interval in Throughput Test 16,530 seconds

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
	420113540	2015-04-20 17:24:28	1703	2015-04-20 17:23:01	2015-04-20 17:52:51
		2015-04-20 17:52:51		2015-04-20 17:24:28	2015-04-20 17:55:47
Throughput Stream	Seed	Query Start Time	Duration (sec)	RF1 Start Time	RF2 Start Time
1	420113541	2015-04-20 17:55:46	14,106	2015-04-20 21:50:51	2015-04-20 21:52:18
		2015-04-20 21:50:52		2015-04-20 21:52:18	2015-04-20 21:55:02
2	420113542	2015-04-20 17:55:46	14,902	2015-04-20 21:55:02	2015-04-20 21:56:25
		2015-04-20 21:50:38		2015-04-20 21:56:25	2015-04-20 21:59:02
3	420113543	2015-04-20 17:55:46	13,823	2015-04-20 21:59:02	2015-04-20 22:00:22
		2015-04-20 21:46:09		2015-04-20 22:00:22	2015-04-20 22:03:52
4	420113544	2015-04-20 17:55:46	13,139	2015-04-20 22:03:53	2015-04-20 22:05:09
		2015-04-20 21:34:45		2015-04-20 22:05:09	2015-04-20 22:07:56
5	420113545	2015-04-20 17:55:46	13,423	2015-04-20 22:07:56	2015-04-20 22:09:26
		2015-04-20 21:39:29		2015-04-20 22:09:26	2015-04-20 22:12:49
6	420113546	2015-04-20 17:55:46	13,746	2015-04-20 22:12:49	2015-04-20 22:14:13
		2015-04-20 21:44:52		2015-04-20 22:14:13	2015-04-20 22:17:51
7	420113547	2015-04-20 17:55:46	12,730	2015-04-20 22:17:51	2015-04-20 22:19:18
		2015-04-20 21:27:56		2015-04-20 22:19:18	2015-04-20 22:22:01



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Throughput Stream	Seed	Query Start Time	Duration (sec)	RF1 Start Time	RF2 Start Time
		Query End Time		RF1 End Time	RF2 End Time
8	420113548	2015-04-20 17:55:46	12,870	2015-04-20 22:22:02	2015-04-20 22:23:24
		2015-04-20 21:30:16		2015-04-20 22:23:24	2015-04-20 22:26:30
9	420113549	2015-04-20 17:55:46	13,921	2015-04-20 22:26:30	2015-04-20 22:27:52
		2015-04-20 21:47:47		2015-04-20 22:27:52	2015-04-20 22:31:16



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TPC-H Timing Intervals (in seconds):

Quer	Strm 0	Strm 1	Strm 2	Strm 3	Strm 4	Strm 5	Strm 6	Strm 7	Strm 8	Strm 9	Min Qi	Max Qi	Avg. Qi
Q1	64.9	112.0	1544.8	254.1	1310.4	695.3	771.0	871.6	849.3	1595.3	64.9	1595.3	806.9
Q2	17.5	454.7	60.1	470.8	61.8	93.1	130.0	83.8	46.0	105.1	17.5	470.8	152.3
Q3	42.0	1087.8	1228.2	663.2	1265.2	1083.0	1243.1	576.5	727.5	949.1	42.0	1265.2	886.6
Q4	50.7	155.6	597.7	305.2	532.6	519.8	1292.4	534.8	727.0	608.3	50.7	1292.4	532.4
Q5	55.6	686.5	1731.8	1203.8	120.2	875.3	1289.7	1214.4	748.5	685.6	55.6	1731.8	861.1
Q6	3.0	122.2	22.2	71.8	152.3	70.3	90.1	108.2	175.0	161.0	3.0	175.0	97.6
Q7	25.0	1605.7	936.4	636.2	550.0	965.4	664.4	954.8	1536.4	1209.9	25.0	1605.7	908.4
Q8	42.6	614	607.6	466.9	428.3	1800.5	959.4	738.5	647.2	880.2	42.6	1800.5	718.5
Q9	416.1	1451.5	986.8	1444.7	2008.4	1325.2	969.5	561.1	574.5	1327.5	416.1	2008.4	1106.5
Q10	102.6	1431.5	841.7	960.4	759.8	685.2	174.7	687.5	1937.1	865.5	102.6	1937.1	844.6
Q11	49.9	310.7	255.6	422.7	235.7	273.8	292.1	295.5	188.2	258.0	49.9	422.7	258.2
Q12	18.3	847.9	450.7	1165.1	729.7	565.5	134.0	285.2	553.7	534.2	18.3	1165.1	528.4
Q13	203.6	633.2	397.5	499.0	744.2	404.0	488.0	766.7	875.4	465.8	203.6	875.4	547.7
Q14	9.1	135.3	137.5	99.8	58.0	134.2	57.2	65.6	141.0	55.3	9.1	141.0	89.3
Q15	9.3	197.3	175.7	184.2	142.0	222.5	158.6	152.8	145.8	149.9	9.3	222.5	153.8
Q16	19.1	400.3	337.2	206.2	107.7	575.5	305.9	156.4	120.3	46.5	19.1	575.5	227.5
Q17	18.3	571.0	869.0	964.5	981.7	232.7	1321.8	991.6	701.5	752.4	18.3	1321.8	740.5
Q18	327.5	1565.1	1685.1	1048.9	928.4	759.7	789.9	1012.2	1128.2	1167.2	327.5	1685.1	1041.2
Q19	21.9	619.0	315.5	738.8	294.2	473.0	1341.8	868.1	19.5	1064.8	21.9	1341.8	575.7
Q20	19.3	246.6	131.3	221.9	196.9	502.3	402.4	139.5	185.7	268.6	19.3	502.3	231.5
Q21	155.1	663.6	594.9	1592.5	1209.7	994.4	732.5	1423.2	509.8	576.3	155.1	1592.5	845.2
Q22	30.0	193.5	184.0	200.9	320.9	171.8	136.2	240.8	331.6	193.5	30.0	331.6	200.3
RF1	86.9	85.8	82.3	80.5	76.6	90.1	83.9	86.7	82.4	82.0	76.6	90.1	83.7
RF2	175.9	164.0	156.7	209.8	166.4	202.8	217.8	163.1	185.9	203.2	156.7	217.8	184.6