

<b>Hewlett Packard Enterprise</b>		<b>HPE Superdome Flex 280 Server</b>		TPC-H Rev. 3.0.0 TPC Pricing Rev. 2.8.0 Report Date: February 26, 2022	
Total System Cost		Composite Query per Hour Rating		Price/Performance	
<b>\$2,507,517 USD</b>		<b>1,147,031.4</b> QpH @100,000GB		<b>\$2,186.10 USD</b> \$/kQpH @100,000GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date	
<b>100,000GB</b>	<b>Microsoft® SQL Server 2019 Enterprise Edition</b>	<b>Windows Server 2022 Datacenter Edition</b>	<b>None</b>	<b>Now (at time of publication)</b>	



Database Load Time = <b>08d 12h 55m 24s</b>	<b>Storage Redundancy Level</b>	
Load included backup: <b>Y</b>	Base Tables and Auxiliary Data Structures	<b>No RAID</b>
Total Data Storage / Database Size = <b>1.89</b>	DBMS Temporary Space	<b>No RAID</b>
Memory/Database Size = <b>12.3%</b>	OS and DBMS Software	<b>RAID 1</b>
	DBMS Transaction Log	<b>RAID 1</b>

System Components	System Total
Nodes:	1
INTEL® Xeon-Platinum 8380HL @ 2.9GHz:	8
Cores/Threads:	224/448
Memory:	12,288 GiB
6.4TB NVMe Drives	25
Disk Drives (6.4TB SAS 12G SSD)	6
Disk Drives (2.4TB SAS 12G HDD)	2
<b>Total Storage:</b>	<b>189,244.75 GiB</b>



# HPE Superdome Flex 280 Server

TPC-H Rev. 3.0.0  
TPC Pricing Rev. 2.8.0

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Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
<b>Server Hardware</b>						
HPE 42U 600x1200mm Adv G2 Kit Shck Rack	1	P9K10A	\$3,275	1	\$3,275	
HPE SD Flex 280 4-socket Base Chassis	1	R4R03A	\$10,473	1	\$10,473	
HPE SD Flex 280 4-socket Expansion Chassis	1	R4R05A	\$10,871	1	\$10,871	
Intel Xeon-Platinum 8380HL (2.9GHz) Processor Kit	1	R4R14A	\$27,809	8	\$222,472	
HPE SD Flex 280 128GB Quad Rank x4 DDR4-3200 Mem Kit	1	R4S29A	\$8,423	96	\$808,608	
HPE SD Flex 280 PCIe LP 16-slot Bulkhead with 1x 4-slot Riser Kit	1	R4S37A	\$1,169	1	\$1,169	
HPE Superdome Flex 280 4-slot 2x8/2x16 PCIe Left Riser	1	R4S12A	\$800	2	\$1,600	
HPE Superdome Flex 280 4-slot 2x8/2x16 PCIe Right Riser	1	R4S39A	\$800	4	\$3,200	
HPE SD Flex 280 6-8 Sockets UPI Internal Enablement Kit	1	R4R09A	\$1,785	1	\$1,785	
HPE SD Flex 280 6-8 Sockets UPI External Enablement Kit	1	RFR10A	\$2,419	1	\$2,419	
HPE SD Flex 280 1600W Plat Ht Plg Power Supply	1	R4S14A	\$1,059	4	\$4,236	
HPE SD Flex 280 8SFF Standard Storage Backplane Kit	1	R4S21A	\$364	1	\$364	
CABLE SLIM SAS 8i TO 8i (connect to PCH)	1	R4S25A	\$62	2	\$124	
HPE SD Flex 280 C14 250V 10A Pwr Cord	1	R4S18A	\$23	8	\$184	
HPE Ethernet 10Gb 2-port BASE-T X550-AT2 Adapter	1	817738-B21	\$1,328	2	\$2,656	
HPE USB US Keyboard/Mouse Kit	1	631341-B21	\$32	3	\$96	
HPE 3Y FC 24x7 SDFlex 280 SVC	1	H7J35A3#Z5	\$5,760	1		\$5,760
<b>Subtotal</b>					<b>\$1080,461</b>	<b>\$5,760</b>
<b>Storage</b>						
HPE SD Flex 280 SmartRAID 3162-8i/e 8-port Internal SAS Adapter	1	R5Y72A	\$2,107	1	\$2,107	
HPE 6.4TB NVMe x8 Lanes Mixed Use 3yr Wty Firmware Card	1	P26938-H21	\$9,738	25	\$243,450	
HPE 6.4TB SAS 12G Mixed Use SFF SSD BC SSD 3-year Warranty	1	P40563-H21	\$11,165	6	\$66,990	
HPE 2.4TB SAS 12G MC 10K SFF (2.5in) BC 3yr Wty 512e HDD	1	P28352-H21	\$1,332	2	\$2,644	
<b>Subtotal</b>					<b>\$315,211</b>	<b>\$0</b>
<b>Other</b>						
Other HP 23 Inch Monitor 3 HP	3	2XN60AA	\$180	3	\$540	
<b>Subtotal</b>					<b>\$540</b>	<b>\$0</b>
<b>Software Components</b>						
SQL Server 2019 Enterprise Edition (2 core license)	2	N/A	\$13,748	112	\$1,539,776	
Microsoft Problem Resolution Services	2	N/A	\$259	1		\$259
Windows Server 2022 Datacenter Edition	2	G3J30AAE	\$6,155	14	\$86,170	
<b>Subtotal</b>					<b>\$1,625,946</b>	<b>\$259</b>
Total Extended Price					\$3,022,158	\$6,019
Total Discounts					\$518,644	\$2,016
Price Key: 1 - HPE , 2 - Microsoft, 3 - Hewlett Packard Inc.		<b>Grand Total</b>			<b>\$2,503,514.00</b>	<b>\$4,003.00</b>
<b>Audited by Doug Johnson of InfoSizing (www.sizing.com)</b>						
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.		<b>3 year cost of ownership USD:</b>			<b>\$2,507,517.00</b>	
		<b>QphH @ 100,000GB :</b>			<b>1,147,031.4</b>	
		<b>\$ USD/QphH @ 100,000GB</b>			<b>\$2,186.10</b>	
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 Superdome Flex 280 Server

TPC-H Rev. 3.0.0  
TPC Pricing Rev. 2.8.0

Report Date:  
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### Measurement Results

Database Scale Factor	<b>100,000</b>
Total Data Storage / Database Size	<b>1.89</b>
Percentage Memory / Database Size	<b>12.3%</b>
Start of Database Load	2022-01-27 20:58:09
End of Database Load	2022-02-05 09:53:34
Database Load Time	<b>08d 12h 55m 24s</b>
Query Streams for Throughput Test	<b>11</b>
TPC-H Power	1,366,154.8
TPC-H Throughput	963,054.2
TPC-H Composite Query-per-Hour (QphH@100,000GB)	<b>1,147,031.4</b>
Total System Price over 3 Years (\$ USD)	<b>\$2,507,574</b>
TPC-H Price/Performance Metric (\$ USD / kQphH@100,000GB)	<b>\$2,286.15</b>

### Measurement Interval

Measurement Interval in Throughput Test **90,462.20 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
	205095334	2022-02-07 15:52:25	02:44:20	2022-02-07 15:46:47	2022-02-07 18:36:45
		2022-02-07 18:36:45		2022-02-07 15:52:24	2022-02-07 19:04:07
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	205095335	2022-02-07 19:04:06	01:04:53	2022-02-07 19:04:06	2022-02-07 19:14:07
		2022-02-08 20:08:59		2022-02-07 19:14:07	2022-02-07 19:49:34
2	205095336	2022-02-07 19:04:06	00:05:17	2022-02-07 19:49:34	2022-02-07 20:00:42
		2022-02-08 19:09:23		2022-02-07 20:00:42	2022-02-07 20:38:16
3	205095337	2022-02-07 19:04:06	00:53:22	2022-02-07 20:38:16	2022-02-07 20:47:07
		2022-02-08 19:57:28		2022-02-07 20:47:07	2022-02-07 21:21:33
4	205095338	2022-02-07 19:04:06	23:50:53	2022-02-07 21:21:33	2022-02-07 21:32:44
		2022-02-08 18:54:59		2022-02-07 21:32:44	2022-02-07 22:09:52
5	205095339	2022-02-07 19:04:06	00:55:07	2022-02-07 22:09:52	2022-02-07 22:20:47
		2022-02-08 19:59:13		2022-02-07 22:20:47	2022-02-07 23:03:02
6	205095340	2022-02-07 19:04:06	23:37:09	2022-02-07 23:03:02	2022-02-07 23:16:41
		2022-02-08 18:41:15		2022-02-07 23:16:41	2022-02-08 00:00:53
7	205095341	2022-02-07 19:04:06	01:00:01	2022-02-08 00:00:54	2022-02-08 00:14:28
		2022-02-08 20:04:07		2022-02-08 00:14:28	2022-02-08 01:02:02
8	205095342	2022-02-07 19:04:06	01:07:43	2022-02-08 01:02:03	2022-02-08 01:27:03
		2022-02-08 20:11:49		2022-02-08 01:27:03	2022-02-08 02:15:53
9	205095343	2022-02-07 19:04:06	00:59:24	2022-02-08 02:15:54	2022-02-08 02:36:27
		2022-02-08 20:03:30		2022-02-08 02:36:27	2022-02-08 03:54:54
10	205095344	2022-02-07 19:04:06	00:42:26	2022-02-08 03:54:55	2022-02-08 04:23:38
		2022-02-08 19:46:32		2022-02-08 04:23:38	2022-02-08 05:21:26
11	205095345	2022-02-07 19:04:07	22:56:13	2022-02-08 05:21:26	2022-02-08 05:38:26
		2022-02-08 18:00:20		2022-02-08 05:38:26	2022-02-08 06:22:38

**TPC-H Timing Intervals (in seconds):**

Query	Stream 0	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5	Stream 6	Stream 7
Q1	108.77	1215.08	1635.79	3815.81	3184.61	2010.60	1573.39	4408.14
Q2	121.36	2785.61	4497.47	6181.18	1300.08	1780.48	3039.26	1837.98
Q3	527.67	8283.12	3215.09	2221.15	2482.85	2981.84	5402.15	2793.76
Q4	203.52	290.05	3223.69	4114.45	4360.32	7434.31	5716.77	6202.76
Q5	416.15	6335.49	4276.17	9916.68	2227.48	2903.63	2125.92	2535.44
Q6	20.20	2803.41	165.34	249.48	4661.36	1680.60	164.18	3503.97
Q7	242.31	5062.88	2752.53	5125.88	3698.89	2506.29	3694.87	2895.65
Q8	771.65	2831.02	2845.45	2992.54	3522.51	6514.54	3919.18	7126.09
Q9	1,674.37	5605.23	9634.65	6093.36	11472.00	7891.56	11157.21	6292.18
Q10	281.70	7083.99	8328.02	2832.19	2177.43	2012.32	2025.99	4171.04
Q11	367.72	4976.97	3589.01	2573.61	2686.26	5414.55	2818.49	3474.63
Q12	98.18	3042.72	3077.76	3496.42	4056.61	2590.95	2499.18	1581.38
Q13	648.44	3534.67	2575.73	5533.91	3379.40	5008.65	8203.23	8609.80
Q14	41.14	2440.81	6306.96	936.94	1125.91	1407.31	789.53	2844.42
Q15	29.64	309.03	479.39	426.65	304.12	659.57	657.21	250.20
Q16	93.99	2861.39	3863.19	2960.77	3580.79	7686.54	7190.15	1369.53
Q17	642.26	4490.51	6560.38	7256.81	6192.82	4451.35	4444.58	4877.10
Q18	1,414.80	13257.90	7212.83	9177.53	7392.20	6902.22	6450.49	9064.39
Q19	245.63	2721.81	1913.70	2524.09	3563.24	4567.40	1946.61	1451.45
Q20	162.56	3149.29	1709.82	2343.12	2488.49	2638.07	2431.41	980.02
Q21	1,609.40	4564.91	5670.39	4864.45	9623.19	6689.88	4139.79	8562.50
Q22	137.67	2646.26	3182.38	3963.71	2371.18	3973.33	4638.08	5167.51
RF1	337.70	599.94	667.73	530.47	671.45	654.79	818.10	814.74
RF2	1,641.75	2127.24	2253.94	2065.88	2227.55	2535.28	2652.56	2854.08

**TPC-H Timing Intervals (in seconds):**

Query	Stream 8	Stream 9	Stream 10	Stream 11	Min Qi	Avg. Qi	Max Qi
Q1	4969.11	6078.22	5627.03	2937.64	108.77	3130.35	6078.12
Q2	2723.48	3435.13	4580.47	1112.60	121.36	2782.93	6181.18
Q3	2863.40	5851.37	6845.60	1852.16	527.67	3776.68	8283.12
Q4	3426.54	2809.12	1683.33	2569.84	203.52	3502.89	7434.31
Q5	7245.72	2772.77	1855.11	3648.51	416.15	3854.92	9916.68
Q6	6505.45	2313.12	177.62	2105.21	20.20	2029.16	6505.45
Q7	3189.19	3706.15	6481.14	2036.98	242.31	3449.40	6481.14
Q8	6537.85	5699.39	5576.76	4033.71	771.65	4364.22	7126.09
Q9	7118.58	7530.22	6487.34	7541.15	1674.37	7374.82	11472.00
Q10	3844.16	3980.77	4135.46	5386.37	281.70	3854.95	8328.02
Q11	732.49	2503.86	3542.78	5627.03	367.72	3192.28	5627.03
Q12	3397.55	1921.58	2518.44	2545.47	98.18	2568.85	4056.61
Q13	4256.03	7731.72	5256.67	3281.88	648.44	4835.01	8609.80
Q14	4863.34	3953.52	656.93	1581.42	41.14	2245.69	6306.96
Q15	602.07	355.35	477.72	593.29	29.64	428.69	659.57
Q16	2238.91	1927.09	3483.09	6248.16	93.99	3625.30	7686.54
Q17	11420.05	6249.59	6804.67	6674.28	642.26	5838.70	11420.05
Q18	6354.60	6382.52	11116.52	9727.61	1414.80	7871.13	13257.90
Q19	1585.25	2243.78	2067.69	2660.83	245.63	2290.96	4567.40
Q20	1803.35	1413.38	2146.63	3275.35	162.56	2045.12	3275.35
Q21	3024.46	8515.92	2986.55	3803.15	1609.40	5337.88	9623.19
Q22	1760.13	2587.94	4437.20	3329.40	137.67	3182.90	5167.51
RF1	1500.14	1233.11	1723.74	1019.71	337.70	880.97	1723.74
RF2	2930.20	4707.34	3467.54	2651.47	1641.75	2676.24	4707.34