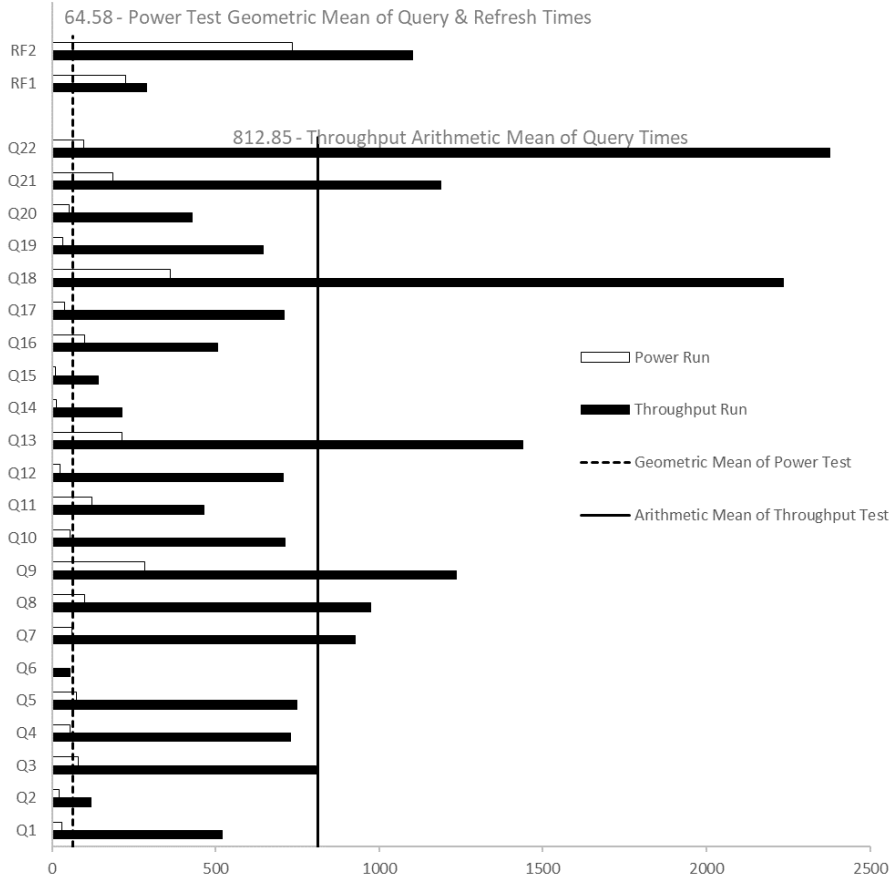
 <b>Hewlett Packard Enterprise</b>		<b>HPE Superdome Flex 280 Server</b>		TPC-H Rev. 2.18.0 TPC Pricing Rev. 2.7.0	
Total System Cost		Composite Query per Hour Rating		Report Date: March 26, 2021	
<b>\$1,076,522 USD</b>		<b>1,446,701.4</b> QphH @ 30,000GB		<b>\$0.75 USD</b> \$ / QphH @ 30,000GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date	
<b>30,000GB</b>	<b>Microsoft® SQL Server 2019 Enterprise Edition</b>	<b>Red Hat® Enterprise Linux® 8</b>	<b>None</b>	<b>Now (at time of publication)</b>	



Database Load Time = <b>02d 0h 33m 49s</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>2.53</b>	DBMS Temporary Space	<b>No RAID</b>
Memory/Database Size = <b>20.5%</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:	4
Cores/Threads:	112/224
Memory:	6,144 GiB
6.4TB NVMe Drives	12
Disk Drives (2.4TB SAS 12G HDD)	2
<b>Total Storage:</b>	<b>75,995.92 GiB</b>



# HPE Superdome Flex 280 Server

TPC-H Rev. 2.18.0  
TPC Pricing Rev. 2.7.0

Report Date: March 26, 2021

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	\$9,500	1	\$9,500	
Intel Xeon-Platinum 8380HL (2.9GHz) Processor Kit	1	R4R14A	\$22,999	4	\$91,996	
HPE SD Flex 280 128GB Quad Rank x4 DDR4-3200 Mem Kit	1	R4S29A	\$4,650	48	\$223,200	
HPE SD Flex 280 PCIe LP 16-slot Bulkhead with 1x 4-slot Riser Kit	1	R4S37A	\$1,100	1	\$1,100	
HPE Superdome Flex 280 4-slot 2x8/2x16 PCIe Left Riser	1	R4S12A	\$750	1	\$750	
HPE Superdome Flex 280 4-slot 2x8/2x16 PCIe Right Riser	1	R4S39A	\$750	2	\$1,500	
HPE SD Flex 280 2-4 Sockets UPI Internal Enablement Kit	1	R4R08A	\$860	1	\$860	
HPE SD Flex 280 1600W Plat Ht Plg Power Supply	1	R4S14A	\$950	2	\$1,900	
HPE SD Flex 280 8SFF Standard Storage Backplane Kit	1	R4S21A	\$350	1	\$350	
CABLE SLIM SAS 8i TO 8i (connect to PCH)	1	R4S25A	\$40	1	\$40	
HPE SD Flex 280 C14 250V 10A Pwr Cord	1	R4S18A	\$10	4	\$40	
HPE Ethernet 10Gb 2-port BASE-T X550-AT2 Adapter	1	817738-B21	\$805	2	\$1,610	
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>\$336,217</b>	<b>\$5,760</b>
<b>Storage</b>						
HPE SD Flex 280 SmartRAID 3162-8i/e 8-port Internal SAS Controller	1	R5Y72A	\$1,660	1	\$1,660	
HPE 6.4TB NVMe x8 Lanes Mixed Use 3yr Wty Firmware Card	1	P10268-B21	\$9,751	12	\$117,012	
HPE 2.4TB SAS 12G MC 10K SFF (2.5in) BC 3yr Wty 512e HDD	1	R6N45A	\$1,187	2	\$2,374	
		<b>Subtotal</b>			<b>\$121,046</b>	<b>\$0</b>
<b>Other</b>						
Other HP 23 Inch Monitor 3 HP	3	HP 23f	\$199	3	\$597	
		<b>Subtotal</b>			<b>\$597</b>	<b>\$0</b>
<b>Software Components</b>						
SQL Server 2019 Enterprise Edition for Linux (2 core license)	2	N/A	\$13,748	56	\$769,888	
Microsoft Problem Resolution Services	2	N/A	\$259	1		\$259
RHEL Svr 2 Sckt/2 Gst 3yr 24x7 E-LTU	1	G3J30AAE	\$3,702	2	\$7,404	
		<b>Subtotal</b>			<b>\$777,292</b>	<b>\$259</b>
		Total Extended Price			\$1,235,152	\$6,019
		Total Discounts			\$162,633	\$2,016
Price Key: 1 - HPE, 2 - Microsoft, 3 - Hewlett Packard Inc. <b>Audited by Doug Johnson of InfoSizing (www.sizing.com)</b>		<b>Grand Total</b>			<b>\$1,072,519.00</b>	<b>\$4,003.00</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>\$1,076,522.00</b>	
		<b>QphH @ 30,000GB :</b>			<b>1,446,701.4</b>	
		<b>\$ USD/QphH @ 30,000GB</b>			<b>\$0.75</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. 2.18.0  
TPC Pricing Rev. 2.7.0

Report Date:  
March 26, 2021

### Measurement Results

Database Scale Factor	<b>30,000</b>
Total Data Storage / Database Size	<b>2.53</b>
Percentage Memory / Database Size	<b>20.5%</b>
Start of Database Load	<b>02-08-2021 09:07:03</b>
End of Database Load	<b>02-10-2021 09:40:52</b>
Database Load Time	<b>02d 00h 33m 49s</b>
Query Streams for Throughput Test	<b>10</b>
TPC-H Power	<b>1,672,428.7</b>
TPC-H Throughput	<b>1,251,440.5</b>
TPC-H Composite Query-per-Hour (QpH@30,000GB)	<b>1,446,701.4</b>
Total System Price over 3 Years (\$ USD)	<b>\$1,076,522.00</b>
TPC-H Price/Performance Metric (\$ USD / QpH@30,000GB)	<b>\$0.75</b>

### Measurement Interval

Measurement Interval in Throughput Test **18,986.12 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
	210094052	2021-02-10 15:56:26	00:33:28	2021-02-10 15:52:42	2021-02-10 16:29:54
		2021-02-10 16:29:54		2021-02-10 15:56:26	2021-02-10 16:42:09
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	210094053	2021-02-10 16:42:08	04:24:52	2021-02-10 16:42:08	2021-02-10 16:46:50
		2021-02-10 21:07:00		2021-02-10 16:46:50	2021-02-10 17:03:53
2	210094054	2021-02-10 16:42:08	05:10:42	2021-02-10 17:03:53	2021-02-10 17:08:34
		2021-02-10 21:52:50		2021-02-10 17:08:34	2021-02-10 17:23:52
3	210094055	2021-02-10 16:42:08	05:14:00	2021-02-10 17:23:52	2021-02-10 17:28:27
		2021-02-10 21:56:08		2021-02-10 17:28:27	2021-02-10 17:45:18
4	210094056	2021-02-10 16:42:09	05:14:26	2021-02-10 17:45:19	2021-02-10 17:50:02
		2021-02-10 21:56:35		2021-02-10 17:50:02	2021-02-10 18:09:10
5	210094057	2021-02-10 16:42:09	05:02:19	2021-02-10 18:09:11	2021-02-10 18:14:43
		2021-02-10 21:44:28		2021-02-10 18:14:43	2021-02-10 18:32:27
6	210094058	2021-02-10 16:42:09	04:40:47	2021-02-10 18:32:27	2021-02-10 18:37:02
		2021-02-10 21:22:56		2021-02-10 18:37:01	2021-02-10 18:56:32
7	210094059	2021-02-10 16:42:09	04:42:28	2021-02-10 18:56:32	2021-02-10 19:01:32
		2021-02-10 21:24:37		2021-02-10 19:01:32	2021-02-10 19:18:27
8	210094060	2021-02-10 16:42:09	05:16:27	2021-02-10 19:18:27	2021-02-10 19:23:04
		2021-02-10 21:58:36		2021-02-10 19:23:04	2021-02-10 19:42:10
9	210094061	2021-02-10 16:42:09	05:15:49	2021-02-10 19:42:11	2021-02-10 19:47:20
		2021-02-10 21:57:58		2021-02-10 19:47:20	2021-02-10 20:06:36
10	210094062	2021-02-10 16:42:09	04:38:49	2021-02-10 20:06:36	2021-02-10 20:11:15
		2021-02-10 21:20:58		2021-02-10 20:11:15	2021-02-10 20:34:07

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

Query	Stream 0	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5	Stream 6
Q1	29.91	223.13	414.77	569.69	412.56	412.56	737.99
Q2	20.87	125.31	173.35	121.58	92.39	117.19	112.55
Q3	80.08	1182.64	560.01	370.47	535.57	1071.92	953.72
Q4	55.29	460.34	527.95	961.46	696.48	1252.93	744.07
Q5	73.61	772.54	1075.50	1075.29	373.53	768.34	928.26
Q6	2.85	45.18	6.24	81.18	129.92	62.76	51.34
Q7	60.28	1381.38	854.34	1251.84	713.93	886.28	1407.35
Q8	100.12	1072.43	1183.14	751.93	969.95	1038.33	816.49
Q9	283.00	1166.19	1197.68	1544.34	1421.80	676.47	1740.49
Q10	56.09	423.96	1227.13	723.68	717.12	376.29	370.66
Q11	121.43	594.65	413.77	510.59	324.84	569.52	326.92
Q12	22.97	515.20	300.28	757.14	1035.14	350.94	958.92
Q13	213.33	1136.50	1468.44	1023.07	1184.27	1241.07	1880.25
Q14	12.59	293.89	394.65	74.31	187.00	229.04	96.29
Q15	10.13	97.77	169.74	116.41	208.85	204.35	160.54
Q16	98.38	291.68	445.61	509.77	693.88	769.76	497.25
Q17	36.96	419.10	708.00	1073.62	532.69	445.00	439.60
Q18	361.05	2609.83	2194.27	1990.37	2237.87	2185.72	2023.01
Q19	32.76	993.01	1125.06	545.52	747.04	974.67	481.62
Q20	50.85	466.03	342.36	292.80	201.21	325.59	375.06
Q21	186.26	1061.94	1025.37	1432.37	1919.75	1061.59	1216.70
Q22	96.51	557.57	2833.31	3061.30	3529.27	3017.26	526.89
RF1	224.85	280.31	280.79	274.67	283.16	332.08	274.45
RF2	735.67	1023.29	917.63	1011.68	1148.60	1064.02	1170.38

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

Query	Stream 7	Stream 8	Stream 9	Stream 10	Min Qi	Max Qi	Avg. Qi
<b>Q1</b>	433.8	1111.62	337.73	454.42	29.91	1111.62	476.25
<b>Q2</b>	145.18	93.49	134.82	85.14	20.87	173.35	111.08
<b>Q3</b>	483.15	763.86	1094.67	1040.19	80.80	1182.64	739.73
<b>Q4</b>	547.82	555.37	1124.9	410.74	55.29	1252.93	667.03
<b>Q5</b>	852.86	955.10	342.31	351.86	73.61	1075.50	688.11
<b>Q6</b>	19.66	60.89	63.35	33.16	2.85	129.92	50.59
<b>Q7</b>	503.73	824.48	643.69	808.81	60.28	1407.35	848.72
<b>Q8</b>	1045.39	963.55	1097.88	796.33	100.12	1183.14	894.14
<b>Q9</b>	1213.51	1579.53	698.90	1129.95	283.00	1740.49	1150.17
<b>Q10</b>	847.71	743.97	753.93	938.58	56.09	1227.13	652.65
<b>Q11</b>	239.22	141.28	856.04	659.92	121.43	856.04	432.57
<b>Q12</b>	540.49	1415.53	189.69	992.5	22.97	1415.53	643.53
<b>Q13</b>	1790.25	1488.28	1911.05	1263.03	213.33	1911.05	1327.23
<b>Q14</b>	283.68	265.59	200.49	112.32	12.59	394.65	195.44
<b>Q15</b>	61.65	167.06	94.22	120.81	10.13	208.85	128.32
<b>Q16</b>	808.71	327.33	101.23	615.86	98.38	808.71	469.04
<b>Q17</b>	752.05	1073.68	766.54	883.32	36.96	1073.68	648.23
<b>Q18</b>	2078.14	1308.69	2829.55	2903.8	361.05	2903.80	2065.66
<b>Q19</b>	520.11	183.35	274.13	612.92	32.76	1125.06	590.02
<b>Q20</b>	573.50	587.86	604.77	503.81	50.85	604.77	393.08
<b>Q21</b>	1238.57	1052.81	1123.27	749.97	186.26	1919.75	1097.15
<b>Q22</b>	1967.83	3322.43	3704.89	1260.33	96.51	3704.89	2170.69
<b>RF1</b>	299.38	276.64	309.72	279.51	224.85	332.08	283.23
<b>RF2</b>	1015.32	1146.51	1155.26	1371.15	735.67	1371.15	1069.05