
	Lenovo® ThinkSystem™ SR665		TPC-H™ 2.18.0 TPC Pricing 2.7.0	
			Report Date: 3/29/21 Revision Date: 3/29/21	
Total System Cost		TPC-H Composite Query per Hour Metric		Price/Performance
\$149,906.00 USD		624,778.0 QphH™@3,000GB		\$0.24 \$ / QphH@3,000GB
Database Size	DBMS Manager	Operating System	Other Software	System Availability Date
3,000GB*	Microsoft® SQL Server® 2019 Enterprise Edition	Red Hat® Enterprise Linux® 8.3	N/A	April 28, 2021
				
Database Load Time 00d 04h 02m 09s	Load Includes Backup Y	Memory/Database Size Percentage 34.1%	Total Disk/Database Size 8.74	
Storage Redundancy Level Zero	Base Tables No RAID	Auxiliary Structures No RAID	DBMS Temp Space No RAID	OS and DBMS RAID-1
<u>System Configuration</u>				
Processors/Cores/Threads	2/16/32	AMD EPYC™ 72F3 8-Core Processor, 3.7GHz, 256MB L3 Cache		
Memory	16	64GB TruDDR4 3200 MHz RDIMM		
Total Memory		1TB		
Storage Controllers	1	ThinkSystem RAID 930-8i 2GB PCIe 12Gb Adapter		
Storage Devices	2	2.5" 5210 960GB Entry SATA 6Gb Hot Swap SSD		
	2	U.2 CM5-V 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD		
	6	U.2 PM1733 3.84TB Entry NVMe PCIe 4.0 x4 Hot Swap SSD		
Total Storage		26,226.04GB		
*Database Size includes only raw data (e.g., no temp, index, redundant storage space, etc.).				



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Description	Part Number	Price Source	Unit Price	Quantity	Extended Price	3-Yr. Maint. Price
Server Hardware						
Server : ThinkSystem SR665-3yr Warranty	7D2VCTO1WW	1	60,999	1	60,999	
ThinkSystem 2U 2.5" Chassis with 8, 16 or 24 Bays	B8LZ			1		
ThinkSystem AMD EPYC 72F3 8C 180W 3.7GHz Processor	BF7H			2		
ThinkSystem 64GB TruDDR4 Performance+ 3200 MHz (2Rx4 1.2V) RDIMM-A	BCZZ			16		
ThinkSystem RAID 930-8i 2GB Flash PCIe 12Gb Adapter	AUNJ			1		
ThinkSystem 1610-8P NVMe Switch Adapter	B4PA			1		
ThinkSystem 2.5" 5210 960GB Entry SATA 6Gb Hot Swap QLC SSD	B9AC			2		
ThinkSystem U.2 Toshiba CM5-V 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	B21X			2		
ThinkSystem U.2 PM1733 3.84TB Entry NVMe PCIe 4.0 x4 Hot Swap SSD	BC4Z			6		
ThinkSystem 2U/4U 8x2.5" NVMe Backplane	BCQM			2		
ThinkSystem 2U 8x2.5" SAS/SATA Backplane	B8LU			1		
ThinkSystem Marvell QL41232 10/25GbE SFP28 2-Port OCP Ethernet Adapter	B5SW			1		
ThinkSystem 2U PCIe Gen4 x16/x16 Slot 1&2 Riser 1 or 2	B8LQ			1		
ThinkSystem 1100W (230V/115V) V2 Platinum Hot-Swap Power Supply	B8QC			2		
2.8m, 13A/100-250V, C13 to C14 Jumper Cord	6400			2		
ThinkSystem XClarity Controller Standard to Enterprise Upgrade	AUPW			1		
ThinkSystem 2U Performance Fan Option Kit	B8LY			6		
ThinkSystem Toolless Slide Rail Kit v2	B8LA			1		
ThinkSystem 2U EIA Latch Standard (Left)	B8L7			1		
Lenovo 1m Passive 25G SFP28 DAC Cable	AV1W			1		
ThinkSystem SR665 2U Refresh MB	BF6Z			1		
ThinkSystem 2U EIA Latch with FIO (right)	B8M9			1		
ThinkSystem 2U MS Air Duct Filler(For 2U Gap)	B8MP			2		
FBU345 SuperCap	AUNP			1		
MS 2FH Riser Filler	BC4X			1		
ThinkSystem 2U MS 3FH Riser Filler	B8MM			1		
ThinkSystem 2U MS 3FH Riser1 Cage	B8MN			1		
Premier Essential - 3Yr 24x7 4Hr Resp + YDYP SR665	5PS7A78552	1	2,786	1		2,786
				Subtotal	60,999	2,786
Server Software						
SQL Server 2019 Enterprise Edition (2 Core License)	N/A	2	13,748	8	109,984	
RHEL Server Physical or Virtual Node, 2 Skt Prem RH Sup 3Yr	2020	1	5,290	1	5,290	
Microsoft Problem Resolution Services (1 Incident)	N/A	2	259	1		259
				Subtotal	115,274	259
Infrastructure						
S2 42U Standard Rack	93074RX	1	1,565	1	1,565	
ThinkSystem Pref. Pro II USB Keyboard - US English	AXTL	1	29	1	29	
ThinkSystem Optical Wheel Mouse - USB	B0LN	1	39	1	39	
ThinkVision T1714p 17 Inch Square LED Backlit LCD Monitor	60FELAR1US	1	159	1	159	
Essential Service - 3Yr 24x7 4Hr Response (Rack)	41L2760	1	315	1		315
				Subtotal	1,792	315
				Total	178,065	3,360
Dollar Volume Discount (See Note 1)	44.28%	1			31,519	
Pricing: 1 - Lenovo 1-877-782-7134; 2 - Microsoft				Three-Year Cost of Ownership USD:		\$149,906.00
Note 1: Discount applies to all line items where Source=1; pricing is for these or similar quantities.				QphH@3000GB:		624,778.0
Discounts for similarly sized configurations will be similar to what is quoted here, but may vary based on the specific components priced.				\$ USD/QphH@3000GB:		\$0.24

Benchmark results and test methodology audited by Doug Johnson for InfoSizing, Inc. (www.sizing.com)

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 section of the TPC benchmark specifications. If you find that stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.



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Measurement Results:

Database Scale Factor	3,000
Total Data Storage/Database Size	8.74
Memory/Database Size	34.1%
Start of Database Load	2021-03-14 12:58:01
End of Database Load	2021-03-14 17:00:10
Database Load Time	00d 04h 02m 09s
Query Streams for Throughput Test	8
TPC-H Power (QppH™@3,000)	853,014.6
TPC-H Throughput (QthH™@3,000)	457,609.5
TPC-H Composite Query-per-Hour Metric (QphH@3,000GB)	624,778.0
Total System Price over 3 Years	\$149,906.00 USD
TPC-H Price/Performance Metric (\$/QphH@3,000GB)	\$ 0.24 USD

Measurement Intervals:

Measurement Interval in Throughput Test (Ts)	4153.76
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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
	314170010	2021-03-14 22:52:54	00:07:51	2021-03-14 22:52:35	2021-03-14 23:00:47
		2021-03-14 23:00:45		2021-03-14 22:52:52	2021-03-14 23:01:40
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	314170011	2021-03-14 23:01:40	00:58:21	2021-03-15 00:01:03	2021-03-15 00:01:20
		2021-03-15 00:00:01		2021-03-15 00:01:20	2021-03-15 00:02:14
2	314170012	2021-03-14 23:01:40	00:58:06	2021-03-15 00:02:14	2021-03-15 00:02:32
		2021-03-14 23:59:46		2021-03-15 00:02:32	2021-03-15 00:03:28
3	314170013	2021-03-14 23:01:40	00:56:05	2021-03-15 00:03:29	2021-03-15 00:03:46
		2021-03-14 23:57:45		2021-03-15 00:03:46	2021-03-15 00:04:43
4	314170014	2021-03-14 23:01:40	00:59:21	2021-03-15 00:04:43	2021-03-15 00:05:00
		2021-03-15 00:01:01		2021-03-15 00:05:00	2021-03-15 00:05:56
5	314170015	2021-03-14 23:01:40	00:58:38	2021-03-15 00:05:56	2021-03-15 00:06:15
		2021-03-15 00:00:18		2021-03-15 00:06:15	2021-03-15 00:07:10
6	314170016	2021-03-14 23:01:40	00:58:54	2021-03-15 00:07:11	2021-03-15 00:07:28
		2021-03-15 00:00:34		2021-03-15 00:07:28	2021-03-15 00:08:26
7	314170017	2021-03-14 23:01:40	00:57:40	2021-03-15 00:08:26	2021-03-15 00:08:43
		2021-03-14 23:59:20		2021-03-15 00:08:43	2021-03-15 00:09:41
8	314170018	2021-03-14 23:01:40	00:54:46	2021-03-15 00:09:41	2021-03-15 00:09:58
		2021-03-14 23:56:26		2021-03-15 00:09:58	2021-03-15 00:10:54



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Timing Intervals (in seconds):

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
0	10.97	3.18	14.41	15.03	18.61	0.51	11.97	15.08	67.52	9.10	21.93	5.83
1	60.72	16.91	123.09	61.73	125.89	4.11	158.41	338.81	347.00	111.01	82.39	91.71
2	66.32	25.08	248.57	95.95	127.67	1.28	92.92	182.40	345.44	79.29	48.52	114.00
3	102.13	15.87	83.02	78.45	181.13	8.27	133.37	220.99	303.00	115.73	46.45	42.49
4	107.94	20.10	14.36	86.47	134.99	3.46	82.29	221.40	617.73	75.21	55.57	189.10
5	67.85	20.69	101.84	101.56	127.82	4.91	83.89	357.94	580.85	65.41	92.47	157.53
6	70.56	19.77	85.22	103.69	94.99	6.36	101.16	349.78	325.28	74.26	129.06	210.26
7	83.28	22.38	88.82	94.22	125.45	2.30	156.69	208.05	499.77	150.69	48.61	44.72
8	75.26	22.09	166.75	132.41	172.49	12.58	74.09	340.8	266.51	65.85	45.2	144.85
QI Min	10.97	3.18	14.36	15.03	18.61	0.51	11.97	15.08	67.52	9.10	21.93	5.83
QI Avg	71.67	18.45	102.90	85.50	123.23	4.86	99.42	248.36	372.57	82.95	63.36	111.17
QI Max	107.94	25.08	248.57	132.41	181.13	12.58	158.41	357.94	617.73	150.69	129.06	210.26

Stream ID	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
0	86.31	3.63	3.12	15.89	6.77	78.36	3.57	10.26	43.74	23.61	17.01	53.40
1	485.65	23.44	81.28	98.37	65.63	591.40	89.41	99.72	264.66	178.88	16.40	53.67
2	563.01	26.29	17.76	171.83	57.86	435.26	24.89	114.11	525.89	120.81	17.85	55.95
3	430.24	27.36	25.53	152.11	51.20	681.62	32.27	104.32	420.97	107.75	17.66	56.49
4	434.43	23.42	17.89	169.12	57.11	778.76	27.94	10.19	306.48	126.33	16.63	55.72
5	533.13	22.88	24.46	90.05	51.24	409.22	152.69	113.03	277.79	79.81	19.05	54.84
6	609.66	31.72	24.05	125.23	40.61	681.55	45.92	93.65	136.61	173.38	16.93	58.23
7	486.15	20.63	17.86	120.67	53.18	535.24	55.81	97.60	381.20	166.08	16.85	57.37
8	403.32	22.74	66.56	112.25	47.1	421.72	40.4	105.4	437.46	108.7	16.58	56.59
QI Min	86.31	3.63	3.12	15.89	6.77	78.36	3.57	10.19	43.74	23.61	16.40	53.40
QI Avg	447.99	22.46	30.95	117.28	47.86	512.57	52.54	83.14	310.53	120.59	17.22	55.81
QI Max	609.66	31.72	81.28	171.83	65.63	778.76	152.69	114.11	525.89	178.88	19.05	58.23