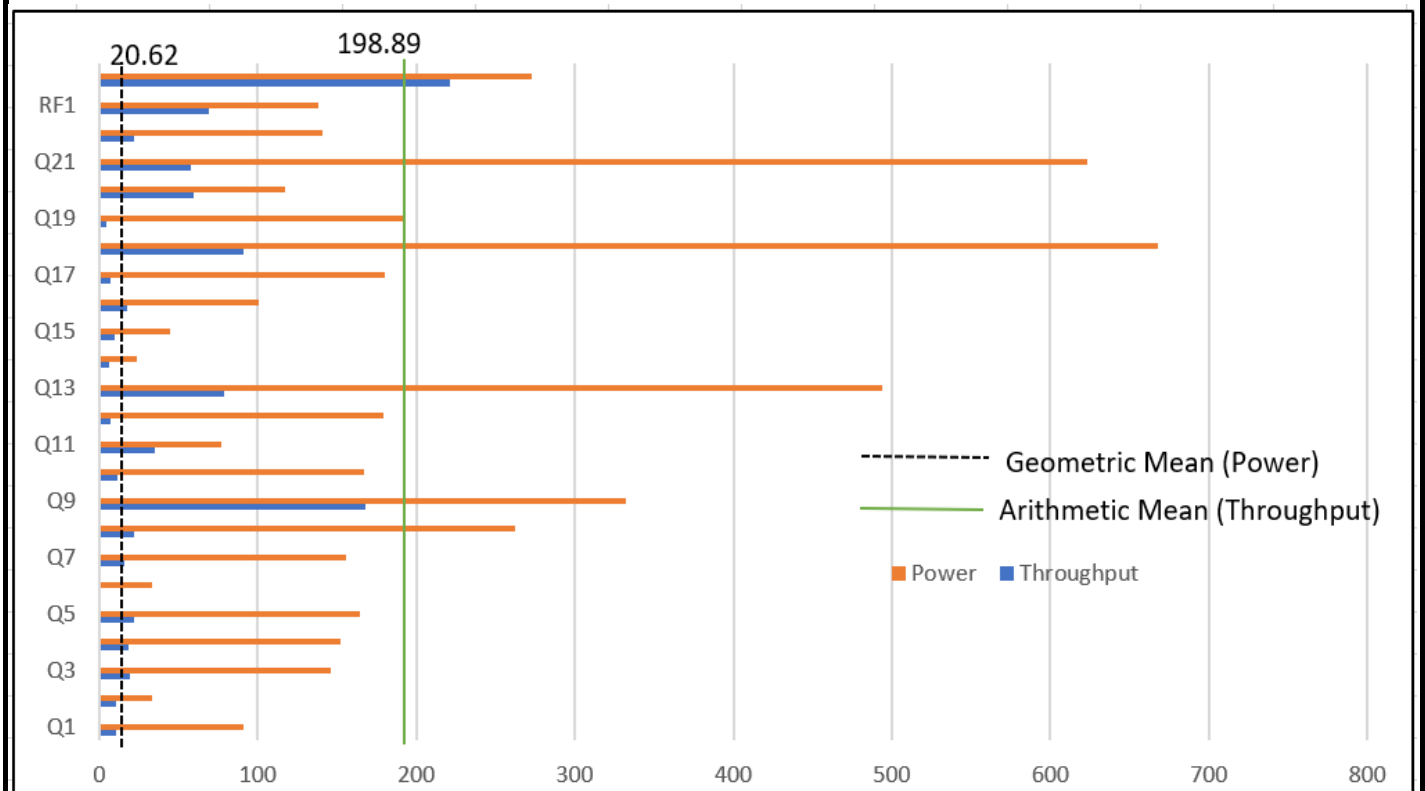
		Cisco UCS C480 M5 Server		TPC-H Rev. 2.18.0 TPC-Pricing Rev. 2.4.0	
				Report Date: 2-Apr-2019	
Total System Cost		Composite Query per Hour Metric		Price / Performance	
1,157,254.12 USD		1,651,514.9 QpH@10000GB		0.71 USD \$ / QpH@10000GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date	
10000GB	Microsoft SQL Server 2017 Enterprise Edition for Linux	Red Hat Enterprise Linux 7.6	None	2-Apr-2019	



Database Load Time = 5h 20m 54s	Storage Redundancy Level	
Load Includes Backup: Y	Base Tables and Auxiliary Data Structures	0
Total Data Storage / Database Size = 2.44	DBMS Temporary Space	0
Percentage Memory / Database Size = 61.4%	OS and DBMS Software	1
System Configuration: Cisco UCS C480 M5 Server		
Processors/Cores/Threads/Model:	4/112/224 Intel 2 nd Gen Xeon Scalable 8280M (2.7GHz, 38.5MB cache)	
Memory:	6 TB	
Storage:	14 x 960GB 2.5 Inch Enterprise Value 6G SATA SSD 4 x Cisco HHHL AIC 3.2T HGST SN260 NVMe Extreme Perf High Endurance	
Table Storage:	23.85 TB	



Cisco UCS C480 M5 Server

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Description	Part Number	Source	Unit Net Price	Qty	Extended Net Price	3 Year Maint. Price
UCS C480 M5 Std base chassis w/o CPU, mem, HDD, PCIe, PSU	UCSC-C480-M5	1	17,195.00	1	17,195.00	
3YR SNTC 24X7X40S UCS C480 M5 Std base chassis w/o CPU, mem,	CON-30SP-9CC480M5	1	5,751.00	1	0.00	5,751.00
UCS C480 M5 CPU Module w/o CPU, mem	UCSC-C480-CM	1	3,500.00	2	7,000.00	
128GB DDR4-2933-MHz LRDIMM/QRx4	UCS-MR-128G8RT-H	1	14,500.00	48	696,000.00	
Cisco UCS 1600W AC Power Supply for Rack Server	UCSC-PSU1-1600W	1	929.00	4	3,716.00	
Power Cord Jumper, C13-C14 Connectors, 2 Meter Length	CAB-C13-C14-2M	1	0.00	4	0.00	
Cable Management Arm for UCS C480 M4	UCSC-CMA-4U-M5	1	150.00	1	150.00	
IMC SW (Recommended) latest release for C-Series Servers.	CIMC-LATEST	1	0.00	1	0.00	
UCS C480 M5 Disk Module Filler	UCSC-C480-DM-FLR	1	0.00	1	0.00	
Rail Kit for UCS C480 M5	UCSC-RAIL-4U-M5	1	0.00	1	0.00	
Super Cap for UCSC-RAID-M5, UCSC-MRAID1GB-KIT	UCSC-SCAP-M5	1	0.00	1	0.00	
Super Cap cable for UCSC-RAID-M5HD	CBL-SC-MR12GM5P	1	0.00	1	0.00	
CPU Heat Sink for UCS C480 M5 Rack Server	UCSC-HS-02-EX	1	0.00	4	0.00	
Intel 8280M 2.7GHz/205W 28C/38.50MB 3DX DDR4 2TB 2933 MHz	UCS-CPU-8280M	1	43,000.00	4	172,000.00	
Cisco 12G Modular RAID controller with 4GB cache	UCSC-RAID-M5HD	1	2,900.00	1	2,900.00	
Cisco HHHL AIC 3.2T HGST SN260 NVMe Extreme Perf High Endrnc	UCSC-NVME-H32003	1	12,672.00	4	50,688.00	
UCS C480 M5 Drive Module for 8x HDD	UCSC-C480-8HDD		800.00	1	800.00	
960GB 2.5 inch Enterprise Value 6G SATA SSD	UCS-SD960G61X-EV	1	3,334.00	6	20,004.00	
UCS C480 M5 Drive Module for 8x HDD	UCSC-C480-8HDD	1	800.00	1	800.00	
960GB 2.5 inch Enterprise Value 6G SATA SSD	UCS-SD960G61X-EV		3,334.00	8	26,672.00	
UCS C-Series M5 SFF drive blanking panel	UCSC-BBLKD-S2	1	0.00	2	0.00	
Cisco R42612 standard rack, w/side panels	RACK2-UCS2	1	6,241.00	1	6,241.00	
GKM513	IOGEAR GKM513Spill Proof Keyboard & Mouse Combo	3	16.93	1	16.93	
VS207D-P	ASUS 19.5" VS207D-P Widescreen LED 1600x900 VGA	3	73.67	1	73.67	
				Subtotal	1,004,166.00	5,751.00
Large Purchase discount	61% for hardware and 35% for service	1		Discounted price	-612,541.26	-2,012.85
				Hardware Subtotal	391,715.34	3,738.15
Software						
SQL Server2017 Enterprise Edition for Linux	NA	2	13,472.50	56	754,460.00	
Red Hat Enterprise Linux Server, 2 Sockets w/ Premium 24x7 support, with 23% discount on 4,598.46	NA	1	3,540.81	2	7,081.63	
Microsoft Problem Resolution Services	NA	2	259.00	1		259.00
				Software Subtotal	761,541.63	259.00
				Total	1,153,256.97	3,997.15
Source: 1-Cisco, 2-Microsoft, 3-Provantage						
Audited by Francois Raab from InfoSizing, Inc. (sizing.com)						
					Three-Year Cost of Ownership	1,157,254.12
						USD
					QphH	1,651,514.90
					\$/QphH	\$0.71
This Price Estimate does not constitute an offer by Cisco to sell products, but is instead an invitation to issue a purchase order to Cisco until the valid date specified in this Price Estimate. Such a purchase order will be subject to Cisco standard procedures, terms and conditions for the acceptance of purchase orders. This order may be subject to sales tax, VAT, duty and freight charges even if not noted on this estimate.						



Cisco UCS C480 M5 Server

TPC-H Rev. 2.18.0
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 Report Date: 2-Apr-2019

Measurement Results

Database Scaling (SF/Size)	10,000
Total Data Storage/Database Size	2.44
Percentage Memory/Database Size	61.4
Start of Database Load Time	03/27/2019 23:19:17
End of Database Load Time	03/28/2019 04:40:12
Database Load Time	00d 05h 20m 54s
Query Streams for Throughput Test (S)	9
TPC-H Power	1,746,029.4
TPC-H Throughput	1,562,116.5
TPC-H Composite	1,651,514.9
Total System Price Over 3 Years	\$1,157,254.12
TPC-H Price/Performance Metric (\$/QpH@10000GB)	\$0.71

Measurement Interval

Measurement Interval in Throughput Test (Ts)	4,563.04
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Duration of stream execution:

Power Run	Seed	Query Start Time	Total Time (hh:mm:ss)	RF1 Start Time	RF2 Start Time
		Query End Time		RF1 End Time	RF2 End Time
	328044012	2019-03-28 06:22:33	00:11:36	2019-03-28 06:21:21	2019-03-28 06:34:11
		2019-03-28 06:34:09		2019-03-28 06:22:30	2019-03-28 06:37:52

Throughput Stream	Seed	Query Start Time	Duration (sec)	RF1 Start Time	RF2 Start Time
		Query End Time		RF1 End Time	RF2 End Time
1	328044013	2019-03-28 06:37:51	01:08:14	2019-03-28 06:37:51	2019-03-28 06:41:03
		2019-03-28 07:46:05		2019-03-28 06:41:03	2019-03-28 06:45:50
2	328044014	2019-03-28 06:37:51	01:11:01	2019-03-28 06:45:50	2019-03-28 06:49:13
		2019-03-28 07:48:52		2019-03-28 06:49:13	2019-03-28 06:53:34
3	328044015	2019-03-28 06:37:51	01:13:42	2019-03-28 06:53:35	2019-03-28 06:55:26
		2019-03-28 07:51:33		2019-03-28 06:55:26	2019-03-28 06:59:47
4	328044016	2019-03-28 06:37:51	01:13:21	2019-03-28 06:59:47	2019-03-28 07:01:50
		2019-03-28 07:51:12		2019-03-28 07:01:49	2019-03-28 07:06:02
5	328044017	2019-03-28 06:37:51	01:15:24	2019-03-28 07:06:03	2019-03-28 07:08:02
		2019-03-28 07:53:15		2019-03-28 07:08:02	2019-03-28 07:12:18
6	328044018	2019-03-28 06:37:52	01:10:25	2019-03-28 07:12:19	2019-03-28 07:14:09
		2019-03-28 07:48:17		2019-03-28 07:14:09	2019-03-28 07:18:26
7	328044019	2019-03-28 06:37:52	01:15:29	2019-03-28 07:18:26	2019-03-28 07:20:04
		2019-03-28 07:53:21		2019-03-28 07:20:03	2019-03-28 07:24:33
8	328044020	2019-03-28 06:37:52	01:16:03	2019-03-28 07:24:33	2019-03-28 07:27:24
		2019-03-28 07:53:55		2019-03-28 07:27:24	2019-03-28 07:32:09
9	328044021	2019-03-28 06:37:52	01:12:50	2019-03-28 07:32:10	2019-03-28 07:34:10
		2019-03-28 07:50:42		2019-03-28 07:34:10	2019-03-28 07:39:36



Cisco UCS C480 M5 Server

TPC-H Rev. 2.18.0
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Report Date: 2-Apr-2019

TPC-H Timing Intervals (in seconds)

Stream ID	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
0	10.41	10.88	19.10	18.61	22.30	0.83	15.69	21.90	167.81	11.64	34.74	7.30
1	127.60	31.77	139.15	166.93	150.99	45.47	137.25	195.51	412.86	166.81	76.80	110.18
2	59.96	35.24	143.34	86.90	150.83	14.88	206.21	309.05	341.40	204.15	81.00	156.93
3	69.42	35.68	63.77	148.81	169.09	69.88	92.82	183.01	399.51	133.44	86.21	125.93
4	75.47	29.21	79.02	115.13	163.71	19.85	169.46	460.29	351.51	138.29	84.70	393.88
5	74.06	25.96	304.83	151.58	203.74	19.43	227.73	184.80	97.99	139.27	75.66	188.68
6	84.16	36.19	118.09	128.91	161.60	37.55	155.57	370.56	309.51	167.07	75.16	113.11
7	87.25	30.55	131.83	201.27	153.04	22.04	99.32	317.97	408.95	56.08	77.70	13.97
8	97.10	37.29	198.16	163.88	186.55	14.27	188.10	158.69	307.93	294.32	39.93	281.66
9	144.16	35.44	134.86	202.53	137.14	57.37	123.49	181.81	360.22	204.07	92.43	229.27
Qi Min	10.41	10.88	19.10	18.61	22.30	0.83	15.69	21.90	97.99	11.64	34.74	7.30
Qi Avg	82.96	30.82	133.22	138.46	149.90	30.16	141.56	238.36	315.77	151.51	72.43	162.09
Qi Max	144.16	37.29	304.83	202.53	203.74	69.88	227.73	460.29	412.86	294.32	92.43	393.88

Stream ID	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
0	78.61	6.53	9.74	17.65	6.97	90.60	4.29	59.83	57.84	21.74	69.05	221.16
1	378.52	27.13	25.24	93.87	89.10	519.55	170.62	127.10	664.11	236.49	190.51	287.43
2	373.76	20.89	49.32	126.42	134.61	961.08	87.15	131.21	454.19	131.07	202.56	261.13
3	517.90	18.63	49.26	252.17	91.36	518.57	384.58	133.14	718.58	159.18	111.43	260.66
4	516.06	18.22	51.45	68.31	302.14	532.75	101.27	84.96	539.63	104.12	122.35	252.69
5	592.04	24.76	44.20	91.55	170.45	766.90	257.56	119.27	661.79	100.55	119.54	256.16
6	483.70	15.96	45.44	83.78	81.15	543.47	371.81	121.52	559.03	160.63	110.23	257.10
7	523.62	14.13	18.25	35.76	337.58	895.15	207.15	65.58	651.74	179.88	96.89	269.12
8	537.74	13.84	59.29	59.83	90.44	708.72	80.10	158.64	763.37	122.59	171.25	285.12
9	520.89	55.50	60.60	92.59	323.74	561.13	80.48	111.01	592.18	68.62	119.85	325.90
Qi Min	78.61	6.53	9.74	17.65	6.97	90.60	4.29	59.83	57.84	21.74	69.05	221.16
Qi Avg	452.28	21.56	41.28	92.19	162.75	609.79	174.50	111.23	566.25	128.49	131.37	267.65
Qi Max	592.04	55.50	60.60	252.17	337.58	961.08	384.58	158.64	763.37	236.49	202.56	325.90