



Cisco UCS C480 M5 Server

TPC-H Rev. 3.0.0
TPC-Pricing Rev.2.7.0

Report Date: 2-Apr-2019

Total System Cost

Composite Query per Hour Metric

Price / Performance

\$1,157,254.12USD

1,651,514.9

\$700.73 USD

\$ / kQphH@10000GB

QphH@10000GB

Database Size

Database Manager

Operating System

Other Software

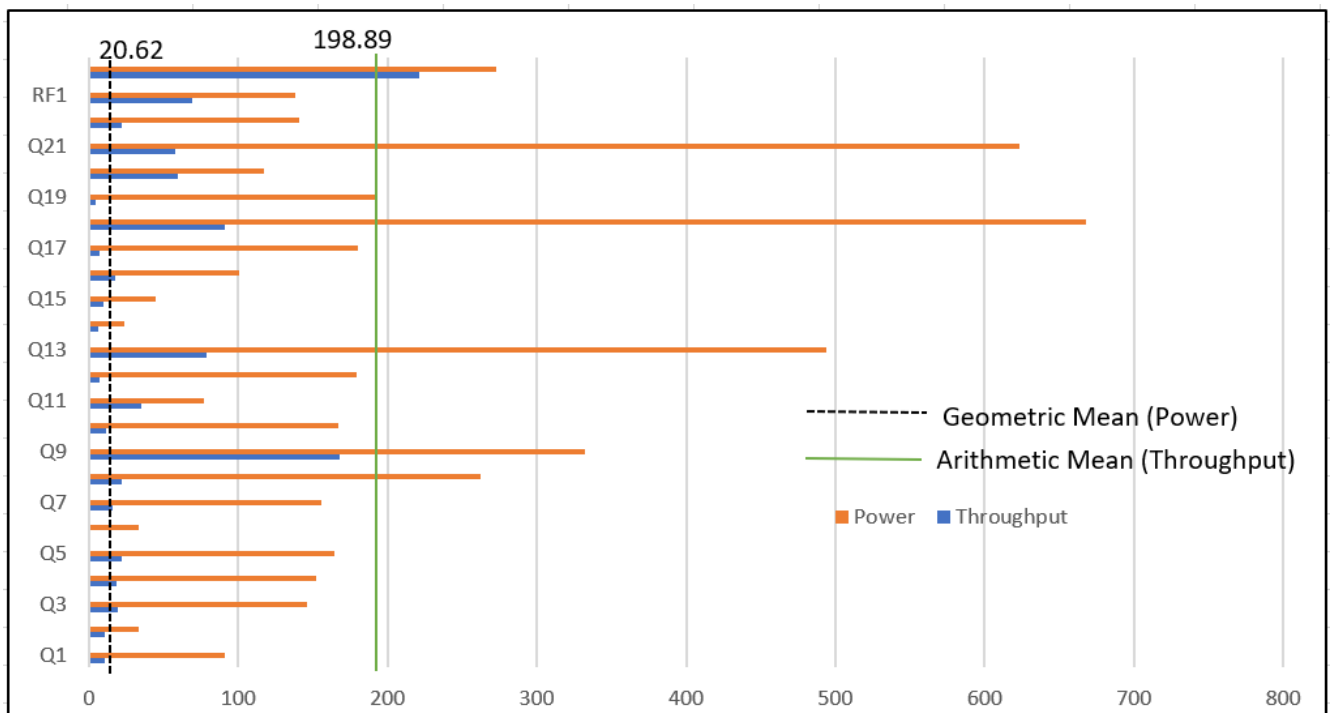
Availability Date

10000GB

**Microsoft SQL Server 2017
Enterprise Edition for Linux**

**Red Hat Enterprise Linux
7.6**

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: 4/112/112 Intel Xeon Platinum 8180M (2.7GHz, 38.5MB L1)

Memory: 6 TB

Storage: 14 X 960TB 2.5 Inch Enterprise Value 6G SATA SSD

4 X Cisco HHHL AIC 3.2T HGST SN260 NVMe Extreme Perf High Endrnc

Table Storage: 23.85 TB



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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 24X7X4OS UCS C480 M5 Std base chassis w/o CPU, mem, | CON-3OSP-SCC480M5 | 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-Microstf, 3-Provantage Audited by Francois Raab from InfoSizing, Inc. (sizing.com) | Three-Year Cost of Ownership | | | | 1,157,254.12 | USD |
| All discounts are based on US list prices and for similar quantities and configurations. The discounts are based on the overall specific components pricing from respective vendors 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 | QpH | | | | 1,651,514.90 | |
| | \$/kQpH | | | | \$700.73 | |
| 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. | | | | | | |



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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 (\$/kQpH@10000GB) | \$700.73 |

Measurement Interval

| | |
|--|----------|
| Measurement Interval in Throughput Test (Ts) | 4,563.04 |
|--|----------|

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 |



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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 |