



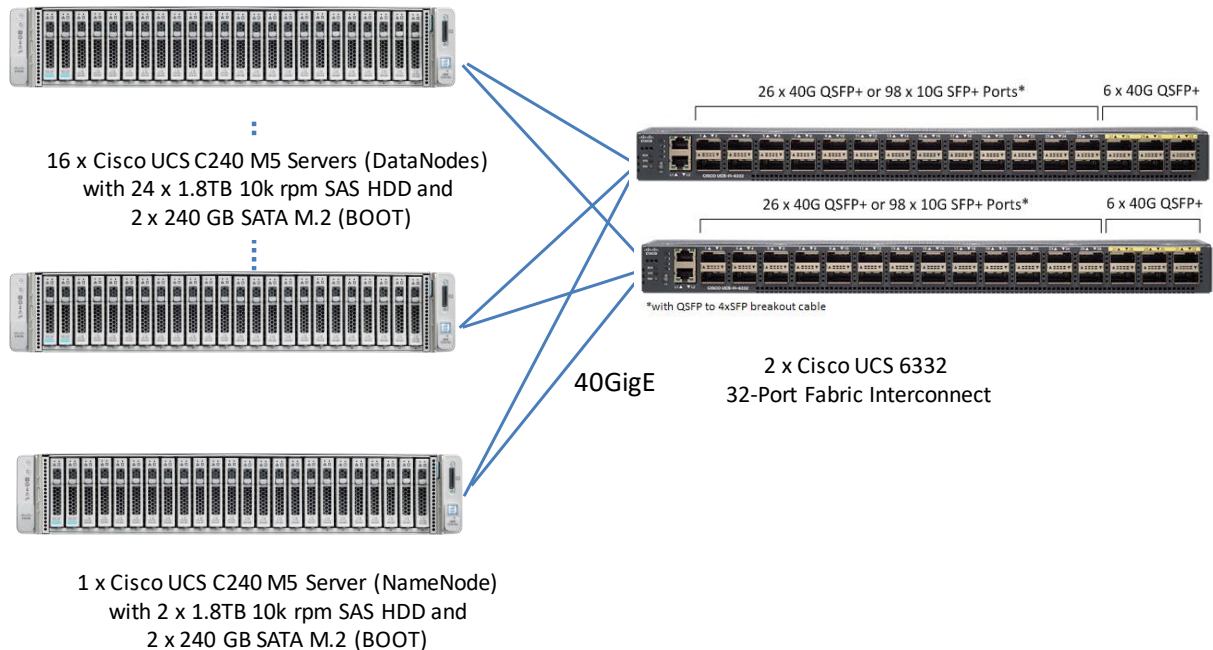
## Cisco UCS Integrated Infrastructure for Big Data and Analytics

TPCx-HS Rev. v2.0.2  
TPC-Pricing Rev. v2.2.0

Report Date:  
**January 30, 2018**

|                    |                                     |   |                |                                     |
|--------------------|-------------------------------------|---|----------------|-------------------------------------|
| Total System Cost  |                                     | TPCx-HS Performance Metric                  |                | Price/Performance                   |
| <b>656,096 USD</b> |                                     | <b>10.96</b><br>HSph@3TB                    |                | <b>59,862.78 USD</b><br>\$/HSph@3TB |
| Scale Factor       | Apache Hadoop Compatible Software   | Operating System                            | Other Software | Availability Date                   |
| 3                  | Cloudera Enterprise Edition V5.13.0 | Red Hat Enterprise Linux Server Release 7.4 | n/a            | January 30, 2018                    |

### System Configuration



Physical Storage/Scale Factor: 234.32

Scale Factor/Physical Memory: 0.94

|                                |   |
|--------------------------------|---|
| Servers:                       | 17 x UCS C240M5   |
| Total Processors/Cores/Threads | 34/476 /952   |
| Server Configuration:          | Per node:   |
| Processors                     | 2 x Intel® Xeon® Gold Processor 6132, 2.60 GHz, 19.25 MB L3   |
| Memory                         | 192GB   |
| Storage Controller             | 1 x Cisco 12G SAS Modular Raid Controller   |
| Storage Device                 | 24 x 1.8TB 10K RPM SAS HDD (data nodes)<br>2 x 1.8TB 10K RPM SAS HDD (name node)<br>2 x 240GB SATA (all nodes, boot disk) |
| Network                        | 1 x Cisco VIC 1387 Dual Port 40Gb QSFP CNA MLOM   |
| Connectivity:                  | 2 x Cisco UCS 6332 32-Port Fabric Interconnect  |
| Total Rack Units:              | $(17 * C240M5) + (2 * FI) = (17 * 2) + (2 * 1) = 36RU$  |



## Cisco UCS Integrated Infrastructure for Big Data and Analytics

TPCx-HS Rev. v2.0.2  
TPC-Pricing Rev. v2.2.0

Report Date:  
January 30, 2018

| Description  | Part Number        | Source | Unit Price   | Qty | Extended Price | 3 Year Maint. Price |
|--|--------------------|--------|--------------|-----|----------------|---------------------|
| UCS C240 M5 24 SFF + 2 rear drives w/o CPU,mem,HD,PCIe,PS  | UCSC-C240-M5SX     | 1      | \$ 4,399.00  | 17  | \$ 74,783.00   |                     |
| 2.6 GHz 6132/140W 14C/19.25MB Cache/DDR4 2666MHz           | UCS-CPU-6132       | 1      | \$ 7,000.00  | 34  | \$ 238,000.00  |                     |
| 16GB DDR4-2666-MHz RDIMM/PC4-21300/single rank/x4/1.2v     | UCS-MR-X16G1RS-H   | 1      | \$ 900.00    | 204 | \$ 183,600.00  |                     |
| Riser 1 incl 3 PCIe slots (x8, x16, x8); slot 3 req CPU2   | UCSC-PCI-1-C240M5  | 1      | \$ 199.00    | 17  | \$ 3,383.00    |                     |
| Cisco VIC 1387 Dual Port 40Gb QSFP CNA MLOM                | UCSC-MLOM-C40Q-03  | 1      | \$ 2,192.00  | 17  | \$ 37,264.00   |                     |
| 240GB SATA M.2   | UCS-M2-240GB       | 1      | \$ 535.00    | 34  | \$ 18,190.00   |                     |
| Cisco UCS 1600W AC Pow er Supply for Rack Server           | UCSC-PSU1-1600W    | 1      | \$ 800.00    | 34  | \$ 27,200.00   |                     |
| Pow er Cord, 125VAC 13A NEMA 5-15 Plug, North America      | CAB-9K12A-NA       | 1      | \$ -         | 34  | \$ -           |                     |
| Ball Bearing Rail Kit for C220 & C240 M4 & M5 rack servers | UCSC-RAILB-M4      | 1      | \$ 220.00    | 17  | \$ 3,740.00    |                     |
| IMC SW (Recommended) latest release for C-Series Servers.  | CIMC-LATEST        | 1      | \$ -         | 17  | \$ -           |                     |
| Heat sink for UCS C240 M5 rack servers 150W CPUs & below   | UCSC-HS-C240M5     | 1      | \$ -         | 34  | \$ -           |                     |
| UCS C-Series M5 SFF drive blanking panel                   | UCSC-BBLKD-S2      | 1      | \$ -         | 56  | \$ -           |                     |
| C240 M5 PCIe Riser Blanking Panel                          | UCSC-PCIF-240M5    | 1      | \$ -         | 17  | \$ -           |                     |
| Mini Storage carrier for M.2 SATA/NVME (holds up to 2)     | UCS-MSTOR-M2       | 1      | \$ -         | 17  | \$ -           |                     |
| Super Cap for UCSC-RAID-M5, UCSC-MRAID1GB-KIT              | UCSC-SCAP-M5       | 1      | \$ -         | 17  | \$ -           |                     |
| Super Cap cable for UCSC-RAID-M5HD                         | CBL-SC-MR12GM5P    | 1      | \$ -         | 17  | \$ -           |                     |
| Cisco 12G Modular RAID controller w ith 4GB cache          | UCSC-RAID-M5HD     | 1      | \$ 2,900.00  | 17  | \$ 49,300.00   |                     |
| Cisco ONE Data Center Compute Opt Out Option               | C1UCS-OPT-OUT      | 1      | \$ -         | 17  | \$ -           |                     |
| UCS SP 1.8 TB 12G SAS 10K RPM SFF HDD (4K) 4Pk             | UCS-SP-H1P8TB-4X   | 1      | \$ -         | 96  | \$ -           |                     |
| 1.8 TB 12G SAS 10K RPM SFF HDD (4K)                        | UCS-SP-H1P8TB      | 1      | \$ 1,500.00  | 384 | \$ 576,000.00  |                     |
| 1.8 TB 12G SAS 10K RPM SFF HDD (4K)                        | UCS-HD18TB10K4KN   | 1      | \$ 1,827.00  | 2   | \$ 3,654.00    |                     |
| SmartNet total care 3YR support (24x7x4)                   | CON-3OSP-C240M5A2  | 1      | \$ 2,364.00  | 17  |                | \$40,188            |
| UCS SP Select 2 x 6332 FI                                  | UCS-SP-FI6332-2X   | 1      | \$ -         | 1   | \$ -           |                     |
| (Not sold standalone) UCS 6332 1RU FI/12 QSFP+             | UCS-SP-FI6332      | 1      | \$ 22,000.00 | 2   | \$ 44,000.00   |                     |
| UCS 6332 Pow er Supply/100-240VAC                          | UCS-PSU-6332-AC    | 1      | \$ -         | 4   | \$ -           |                     |
| 40GBASE-CR4 Passive Copper Cable, 3m                       | QSFP-H40G-CU3M     | 1      | \$ -         | 16  | \$ -           |                     |
| QSFP40G BiDi Short-reach Transceiver                       | QSFP-40G-SR-BD     | 1      | \$ -         | 8   | \$ -           |                     |
| UCS Manager v3.1   | N10-MGT014         | 1      | \$ -         | 2   | \$ -           |                     |
| UCS 6332 Fan Module  | UCS-FAN-6332       | 1      | \$ -         | 8   | \$ -           |                     |
| UCS 6332 Chassis Accessory Kit                             | UCS-ACC-6332       | 1      | \$ -         | 2   | \$ -           |                     |
| 40GBASE-CR4 Passive Copper Cable, 3m                       | QSFP-H40G-CU3M=    | 1      | \$ 250.00    | 20  | \$ 5,000.00    |                     |
| Pow er Cord, 125VAC 13A NEMA 5-15 Plug, North America      | CAB-9K12A-NA       | 1      | \$ -         | 4   | \$ -           |                     |
| 3rd Gen FI Per port License to connect C-direct only       | UCS-LIC-6300-40GC= | 1      | \$ 1,388.00  | 20  | \$ 27,760.00   |                     |
| 3YR SMARTNET24X7X4OS (Not sold standalone) UCS6332         | CON-3OSP-SPFI6332  | 1      | \$ 6,678.00  | 1   |                | \$6,678             |



## Cisco UCS Integrated Infrastructure for Big Data and Analytics

TPCx-HS Rev. v2.0.2  
TPC-Pricing Rev. v2.2.0

Report Date:  
January 30, 2018

| Description   | Part Number                          | Source | Unit Price  | Qty | Extended Price        | 3 Year Maint. Price |
|---|--------------------------------------|--------|-------------|-----|-----------------------|---------------------|
| Cisco R42612 standard rack, w/side panels                     | RACK2-UCS2                           | 1      | \$ 6,341.00 | 1   | \$ 6,341.00           |                     |
| Red Hat Enterprise Linux Server, 3Y 24x7                      | CON-ISV1-EL2S2V3A                    | 1      | \$ 3,897.00 | 17  | \$66,249              |                     |
| Cloudera Enterprise Edition, 3Y 24x7                          | UCS-BD-CEBN-GD=                      | 1      | \$14,057.00 | 17  | \$238,969             |                     |
| <b>Total</b>  |                                      |        |             |     | <b>\$1,603,433.00</b> | <b>\$46,866</b>     |
| Large Purchase Discount <sup>1</sup>                          | 61% for products and 35% for service |        | 1           |     | \$ (978,094.13)       | \$ (16,403.10)      |
| Acer V206HQL-LED monitor -20" (Inc 2 spares)                  | UM.1V6AA.A02                         | 2      | \$ 79.99    | 3   | \$ 239.97             |                     |
| Logitech USB Corded Keyboard/Mouse Combo MK120 (Inc 2 spares) | 920-002565                           | 2      | \$ 17.99    | 3   | \$ 53.97              |                     |

|  |  |                                     |                  |                 |              |                    |                    |
|--|--|-------------------------------------|------------------|-----------------|--------------|--------------------|--------------------|
| Pricing: 1 = Cisco, 2 = CDW<br><br><sup>(1)</sup> 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.<br><br><p style="text-align: center;"><b>Audited by Doug Johnson of InfoSizing</b></p> | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding-right: 20px;"><b>Three-Year Cost of Ownership</b></td> <td><b>\$656,096</b></td> </tr> <tr> <td style="padding-right: 20px;"><b>HSph@3TB</b></td> <td><b>10.96</b></td> </tr> <tr> <td style="padding-right: 20px;"><b>\$/HSph@3TB</b></td> <td><b>\$59,862.78</b></td> </tr> </table> | <b>Three-Year Cost of Ownership</b> | <b>\$656,096</b> | <b>HSph@3TB</b> | <b>10.96</b> | <b>\$/HSph@3TB</b> | <b>\$59,862.78</b> |
| <b>Three-Year Cost of Ownership</b>  | <b>\$656,096</b>   |                                     |                  |                 |              |                    |                    |
| <b>HSph@3TB</b>  | <b>10.96</b>   |                                     |                  |                 |              |                    |                    |
| <b>\$/HSph@3TB</b>   | <b>\$59,862.78</b>   |                                     |                  |                 |              |                    |                    |

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](mailto:pricing@tpc.org). Thank you.



**Cisco UCS Integrated Infrastructure  
for Big Data and Analytics**

TPCx-HS Rev. v2.0.2  
TPC-Pricing Rev. v2.2.0

Report Date:  
January 30, 2018

Numerical Quantities

Performance Run – Run 1

|                         |                         |
|-------------------------|-------------------------|
| Scale Factor            | 3TB                     |
| Run Start Time          | 2018-01-22 18:24:41.000 |
| Run End Time            | 2018-01-22 18:41:04.000 |
| Run Elapsed Time        | 985.000                 |
| HSGen Start Time        | 2018-01-22 18:24:42.000 |
| HSGen End Time          | 2018-01-22 18:28:24.000 |
| HSGen Elapsed Time      | 223.442                 |
| HSSort Start Time       | 2018-01-22 18:28:26.000 |
| HSSort End Time         | 2018-01-22 18:39:14.000 |
| HSSort Elapsed Time     | 648.808                 |
| HSValidate Start Time   | 2018-01-22 18:39:18.000 |
| HSValidate End Time     | 2018-01-22 18:41:04.000 |
| HSValidate Elapsed Time | 107.429                 |

Repeatability Run – Run 2

|                         |                         |
|-------------------------|-------------------------|
| Scale Factor            | 3TB                     |
| Run Start Time          | 2018-01-22 18:41:19.000 |
| Run End Time            | 2018-01-22 18:57:39.000 |
| Run Elapsed Time        | 982.000                 |
| HSGen Start Time        | 2018-01-22 18:41:20.000 |
| HSGen End Time          | 2018-01-22 18:45:00.000 |
| HSGen Elapsed Time      | 220.849                 |
| HSSort Start Time       | 2018-01-22 18:45:02.000 |
| HSSort End Time         | 2018-01-22 18:55:39.000 |
| HSSort Elapsed Time     | 637.555                 |
| HSValidate Start Time   | 2018-01-22 18:55:42.000 |
| HSValidate End Time     | 2018-01-22 18:57:39.000 |
| HSValidate Elapsed Time | 118.572                 |



Run Reports

Run Report for Performance Run – Run 1

=====  
TPCx-HS Performance Metric (HSph@SF) Report

|                    |                |             |
|--------------------|----------------|-------------|
| Test Run 1 Details | Total Time =   | 985         |
|                    | Total Size =   | 30000000000 |
|                    | Scale-Factor = | 3           |

TPCx-HS Performance Metric (HSph@SF): 10.9649

=====  
Run Report for Repeatability Run – Run 2

=====  
TPCx-HS Performance Metric (HSph@SF) Report

|                    |                |             |
|--------------------|----------------|-------------|
| Test Run 2 Details | Total Time =   | 982         |
|                    | Total Size =   | 30000000000 |
|                    | Scale-Factor = | 3           |

TPCx-HS Performance Metric (HSph@SF): 11.0011