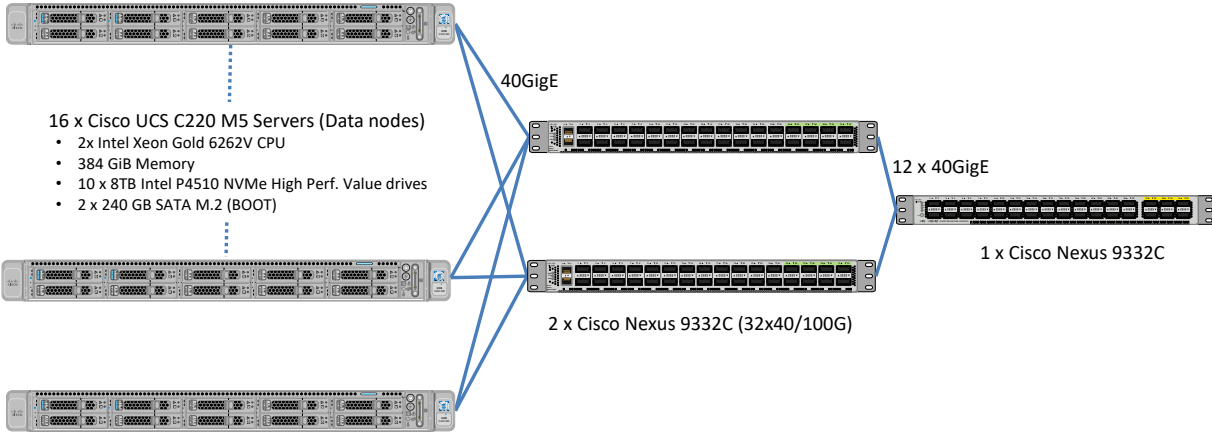

	<h2 style="text-align: center;">Cisco Data Intelligence Platform with All NVMe</h2>		TPCx-HS 2.0.3 TPC Pricing 2.6.0 Report Date Nov. 09, 2020
Availability Date Currently Available	TPCx-HS Performance 16.51 HSph@10TB	Price/Performance \$118,975.11 \$ / HSph@10TB	Total System Cost \$1,964,279 USD
System Under Test Configuration Overview			
Scale Factor 10	Hadoop Software Cloudera Data Platform Private Cloud Base 7.1.1	Operating System Red Hat Enterprise Linux Server 7.7	Other Software None
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>16 x Cisco UCS C220 M5 Servers (Data nodes)</p> <ul style="list-style-type: none"> • 2x Intel Xeon Gold 6262V CPU • 384 GiB Memory • 10 x 8TB Intel P4510 NVMe High Perf. Value drives • 2 x 240 GB SATA M.2 (BOOT) </div> <div style="width: 30%; text-align: center;"> <p>40GigE</p>  <p>2 x Cisco Nexus 9332C (32x40/100G)</p> <p>12 x 40GigE</p> <p>1 x Cisco Nexus 9332C</p> </div> <div style="width: 30%;"> <p>1 x Cisco UCS C220 M5 Servers (Name nodes)</p> <ul style="list-style-type: none"> • 2x Intel Xeon Gold 6230 CPU • 384 GiB Memory • 10 x 1.8TB 10k rpm SAS HDD • 2 x 240 GB SATA M.2 (BOOT) </div> </div>			
Physical Storage/Scale Factor: 130.62		Scale Factor/Physical Memory: 1.57	
Total Number of Servers: Total Processors/Cores/Threads:		17 (16x UCSC-C220-M5SN; 1x UCSC-C220-M5SX) 34/808/1,616	
Server Configuration: Processors Memory Storage Controller Storage Device Network	Per UCSC-C220-M5SN 2x Intel(R) Xeon(R) Gold 6262V CPU 384 GiB None 2x 240GB M.2 SATA SSD 10x 8TB Intel P4510 NVMe 1x VIC 1387 Dual Port 40Gb MLOM	Per UCSC-C220-M5SX 2x Intel(R) Xeon(R) Gold 6230 CPU 384 GiB 1x Cisco 12G SAS Modular RAID 2x 240GB M.2 SATA SSD 10x 1.8TB 12G SAS 10K RPM HDD 1x VIC 1387 Dual Port 40Gb MLOM	
Connectivity: Total Rack Units:		2x Cisco Nexus 9332C, 1x Cisco Nexus 9332C $(17 * C220M5) + (2 * N9332C) + (1 * N9332C) = (17 * 2) + (2 * 1) + (1 * 1) = 37 \text{ RU}$	

	<h2 style="text-align: center;">Cisco Data Intelligence Platform with All NVMe</h2>		TPCx-HS		2.0.3	
			TPC Pricing		2.6.0	
			Report Date		Nov. 09, 2020	
Description	Part Number	Source	Unit Price	Qty	Extended Price	3 Yr. Maint. Price
Data Nodes						
UCS C220 M5 SFF 10 NVMe w/o CPU, mem, HD, PCIe, PSU	UCSC-C220-M5SN	1	\$5,418.15	16	\$86,690.40	
SNTC 24X7X40S UCS C220 M5 SFF NVMe 10 HD w/o CPU, mem, HD, P	CON-OSP-C220M5SN	1	\$2,227.05	16		\$35,632.80
32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v	UCS-MR-X32G2RT-H	1	\$2,050.15	192	\$393,628.80	
8TB 2.5in U.2 Intel P4510 NVMe High Perf. Value Endurance	UCSC-NVMEHW-I8000	1	\$14,726.36	160	\$2,356,217.60	
Cisco VIC 1387 Dual Port 40Gb QSFP CNA MLOM	UCSC-MLOM-C40Q-03	1	\$2,199.67	16	\$35,194.72	
240GB SATA M.2	UCS-M2-240GB	1	\$536.87	32	\$17,179.84	
IMC SW (Recommended) latest release for C-Series Servers.	CIMC-LATEST	1	\$0.00	16	\$0.00	
Cisco UCS 1050W AC Power Supply for Rack Server	UCSC-PSU1-1050W	1	\$731.55	32	\$23,409.60	
Power Cord, 200/240V 6A North America	CAB-N5K6A-NA	1	\$0.00	32	\$0.00	
Ball Bearing Rail Kit for C220 & C240 M4 & M5 rack servers	UCSC-RAILB-M4	1	\$220.77	16	\$3,532.32	
Big Data and Analytics Platform (Hadoop/loT/ITOA/AI/ML)	UCS-SID-INFR-BD	1	\$0.00	16	\$0.00	
Big Data and Analytics (Hadoop/loT/ITOA)	UCS-SID-WKL-BD	1	\$0.00	16	\$0.00	
Mini Storage carrier for M.2 SATA/NVME (holds up to 2)	UCS-MSTOR-M2	1	\$0.00	16	\$0.00	
Heat sink for UCS C220 M5 rack servers 150W CPUs & below	UCSC-HS-C220M5	1	\$0.00	32	\$0.00	
Intel 6262V 1.9GHz/135W 24C/ 33MB DCP DDR4 2400 MHz	UCS-CPU-I6262V	1	\$10,396.26	32	\$332,680.32	
Name Node						
UCS C220 M5 SFF 10 HD w/o CPU, mem, HD, PCIe, PSU	UCSC-C220-M5SX	1	\$4,151.95	1	\$4,151.95	
SNTC 24X7X40S UCS C220 M5 SFF 10 HD w/o CPU, mem, HD, PCIe,	CON-OSP-C220M5SX	1	\$2,227.05	1		\$2,227.05
32GB DDR4-2933-MHz RDIMM/2Rx4/1.2v	UCS-MR-X32G2RT-H	1	\$2,050.15	12	\$24,601.80	
1.8TB 12G SAS 10K RPM SFF HDD (4K)	UCS-HD18TB10K4KN	1	\$1,924.71	10	\$19,247.10	
Cisco VIC 1387 Dual Port 40Gb QSFP CNA MLOM	UCSC-MLOM-C40Q-03	1	\$2,199.67	1	\$2,199.67	
240GB SATA M.2	UCS-M2-240GB	1	\$536.87	2	\$1,073.74	
IMC SW (Recommended) latest release for C-Series Servers.	CIMC-LATEST	1	\$0.00	1	\$0.00	
Cisco UCS 1050W AC Power Supply for Rack Server	UCSC-PSU1-1050W	1	\$731.55	2	\$1,463.10	
Power Cord, 200/240V 6A North America	CAB-N5K6A-NA	1	\$0.00	2	\$0.00	
Ball Bearing Rail Kit for C220 & C240 M4 & M5 rack servers	UCSC-RAILB-M4	1	\$220.77	1	\$220.77	
Performance Optimized setting for C220 M5 servers	UCSC-SW-C220M5-P01	1	\$0.00	1	\$0.00	
Big Data and Analytics Platform (Hadoop/loT/ITOA/AI/ML)	UCS-SID-INFR-BD	1	\$0.00	1	\$0.00	
Big Data and Analytics (Hadoop/loT/ITOA)	UCS-SID-WKL-BD	1	\$0.00	1	\$0.00	
Mini Storage carrier for M.2 SATA/NVME (holds up to 2)	UCS-MSTOR-M2	1	\$0.00	1	\$0.00	
Super Cap cable for UCSC-RAID-M5 on C240 M5 Servers	CBL-SC-MR12GM52	1	\$0.00	1	\$0.00	
Super Cap for UCSC-RAID-M5, UCSC-MRAID1GB-KIT	UCSC-SCAP-M5	1	\$0.00	1	\$0.00	
Heat sink for UCS C220 M5 rack servers 150W CPUs & below	UCSC-HS-C220M5	1	\$0.00	2	\$0.00	
Intel 6230 2.1GHz/125W 20C/27.50MB DCP DDR4 2933 MHz	UCS-CPU-I6230	1	\$6,522.75	2	\$13,045.50	
Cisco 12G Modular RAID controller with 2GB cache	UCSC-RAID-M5	1	\$2,163.55	1	\$2,163.55	
Network						
Nexus 9K ACI & NX-OS Spine, 32p 40/100G & 2p 10G	N9K-C9332C	1	\$36,126.00	3	\$108,378.00	
SNTC-24X7X4 Nexus 9K ACI NX-OS Spine, 32p 40/100G	CON-SNTP-N9KC9332	1	\$8,121.00	3		\$24,363.00
Dummy PID for mode selection	MODE-NXOS	1	\$0.00	3	\$0.00	
Nexus 9500, 9300, 3000 Base NX-OS Software Rel 9.3.5	NXOS-9.3.5	1	\$0.00	3	\$0.00	
Nexus 3K/9K Fixed Accessory Kit, 1RU front and rear removal	NXK-ACC-KIT-1RU	1	\$0.00	3	\$0.00	
Nexus AC 1100W PSU - Port Side Exhaust	NXA-PAC-1100W-PE2	1	\$0.00	6	\$0.00	
Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	CAB-9K12A-NA	1	\$0.00	6	\$0.00	
Nexus Fan, 35CFM, port side exhaust airflow	NXA-FAN-35CFM-PE	1	\$0.00	15	\$0.00	
40GBASE Active Optical Cable, 3m	QSFP-H40G-AOC3M=	1	\$950.97	46	\$43,744.62	
(continued next page)						

	<h2 style="text-align: center;">Cisco Data Intelligence Platform with All NVMe</h2>	TPCx-HS	2.0.3
		TPC Pricing	2.6.0
		Report Date	Nov. 09, 2020

(continued from previous page)

Description	Part Number	Source	Unit Price	Qty	Extended Price	3 Yr. Maint. Price
Infrastructure						
Cisco R42612 standard rack, w/side panels	RACK2-UCS2		\$6,262.84	1	\$6,262.84	
24A Metered Input 1-Phase 6x C19, 36x C13 - 0U PDU (spares)	RP208-30M1P-6-36		\$2,471.62	2	\$4,943.24	
Software						
Cloudera Data Platform Data Center with 3-Yr Gold Support	UCS-BD-CDPDC-GL-3Y		\$60,000.00	17		\$1,020,000.00
price per CCU per year for compute in excess of 16 cores/128GB RAM per node	UCS-BD-CDP-C-3Y		\$450.00	544		\$244,800.00
price per TB per year for TB in excess of 48 TB per Node	UCS-BD-CDP-S-3Y		\$150.00	512		\$76,800.00
Red Hat Enterprise Linux (1-2 CPU, 1-2 VN); 3-Yr Support Req	RHEL-2S2V-3A=		\$0.00	17	\$0.00	
ISV 24X7 RHEL Server 2Socket-OR-2Virtual; ANNUAL List Price	CON-ISV1-EL2S2V3A		\$3,897.00	17		\$66,249.00
Acceptance of Terms, Standalone RHEL License for UCS Servers	UCS-RHEL-TERMS		\$0.00	17	\$0.00	
Misc						
Acer V246HQL - LED monitor			\$93.99	3	\$281.97	
Logitech MK120 USB Wired Keyboard/Mouse Set			\$17.99	3	\$53.97	
Large Purchase Discount 1						
61% for products					-\$2,122,817.98	
61% for Cloudera Data Platform						-\$818,376.00
35% for service and RHEL						-\$44,965.14
Totals					\$1,357,547.44	\$606,730.71


Pricing: 1 = Cisco; 2 = CDW

* Discount applies to all line items where Source = 1. Discount based upon total system cost as purchased by a regular customer.

Audited by Doug Johnson, InfoSizing

Three-Year Cost of Ownership: \$1,964,279
HSph@10TB: 16.51
\$ / HSph@10TB: \$118,975.11

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated Line Items. 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 Line Items. For complete details, see the pricing section of the TPC Benchmark Standard. If you find that the stated prices are not available according to these terms, please inform the TPC at pricing@tpc.org. Thank you.

	Cisco Data Intelligence Platform with All NVMe	TPCx-HS 2.0.3 TPC Pricing 2.6.0 Report Date Nov. 09, 2020
Numerical Quantities		
Performance Run – Run 1		
Scale Factor		10TB
Run Start Time		2020-10-20 07:10:48.000
Run End Time		2020-10-20 07:47:06.000
Run Elapsed Time		2,180.000
HSGen Start Time		2020-10-20 07:10:50.000
HSGen End Time		2020-10-20 07:19:16.000
HSGen Elapsed Time		507.427
HSSort Start Time		2020-10-20 07:19:18.000
HSSort End Time		2020-10-20 07:43:07.000
HSSort Elapsed Time		1,429.601
HSValidate Start Time		2020-10-20 07:43:10.000
HSValidate End Time		2020-10-20 07:47:06.000
HSValidate Elapsed Time		238.196
Repeatability Run – Run 2		
Scale Factor		10TB
Run Start Time		2020-10-20 07:48:11.000
Run End Time		2020-10-20 08:24:17.000
Run Elapsed Time		2,168.000
HSGen Start Time		2020-10-20 07:48:12.000
HSGen End Time		2020-10-20 07:56:36.000
HSGen Elapsed Time		505.173
HSSort Start Time		2020-10-20 07:56:38.000
HSSort End Time		2020-10-20 08:20:32.000
HSSort Elapsed Time		1,434.925
HSValidate Start Time		2020-10-20 08:20:35.000
HSValidate End Time		2020-10-20 08:24:17.000
HSValidate Elapsed Time		223.258

	Cisco Data Intelligence Platform with All NVMe	TPCx-HS	2.0.3
		TPC Pricing	2.6.0
		Report Date	Nov. 09, 2020

Run Reports

Run Report for Performance Run – Run 1

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TPCx-HS Performance Metric (HSph@SF) Report

Test Run 1 Details	Total Time =	2180
	Total Size =	100000000000
	Scale-Factor =	10

TPCx-HS Performance Metric (HSph@SF): 16.5152

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Run Report for Repeatability Run – Run 2

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TPCx-HS Performance Metric (HSph@SF) Report

Test Run 2 Details	Total Time =	2168
	Total Size =	100000000000
	Scale-Factor =	10

TPCx-HS Performance Metric (HSph@SF): 16.6057

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	Cisco Data Intelligence Platform with All NVMe	TPCx-HS 2.0.3 TPC Pricing 2.6.0 Report Date Nov. 09, 2020
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Revision History

Date	Edition	Description
November 9, 2020	First	Initial Publication