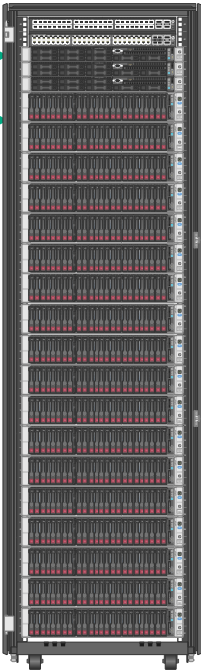
 Hewlett Packard Enterprise		Hewlett Packard Enterprise ProLiant DL for Big Data		TPCx-BB Rev. v1.2.0 TPC-Pricing Rev. v2.1.1	
Total System Cost		TPCx-BB Performance Metric		Report Date: July 9, 2017	
879,682 USD		1,491.23 BBQpm@10000		589.91 USD \$/BBQpm@10000	
Framework	Operating System	Other Software	Availability Date	Scale Factor	Streams
Cloudera for Apache Hadoop (CDH) 5.11.1	Red Hat Enterprise Linux Server 7.3	OpenJDK 1.8.0_102 (1 node) Java 1.8.0_131 (20 nodes)	July 9, 2017	10000	2
System Configuration					
<div style="border: 1px solid black; padding: 5px;"> Ethernet Switch: HPE 1620-24G Switch (ILO connection) HPE FlexFabric 5950 100/25G (main connection) </div>				<div style="border: 1px solid black; padding: 5px;"> Software: Red Hat Enterprise Linux 7.3 Cloudera Enterprise 5.11.1 </div>	
<div style="border: 1px solid black; padding: 5px;"> 3 Management Node: Each: HPE ProLiant DL360 Gen10 2x Intel Xeon Silver 4116@2.10GHz 1x HPE 800GB 6G SATA SSD 192GB Memory </div>				<div style="border: 1px solid black; padding: 5px;"> 18 Worker Nodes: Each: HPE ProLiant DL380 Gen10 2x Intel Xeon Gold 6154@3.00GHz 1x HPE 400GB 6G SATA SSD (5 nodes) 1x HPE 480GB 6G SATA SSD (13 nodes) 1x HPE 800GB 6G SATA SSD 24x HPE 600GB 6G SAS 10K HDD 384GB Memory </div>	
Physical Storage/Scale Factor: 28.42			Scale Factor/Physical Memory: 1.34		
Servers: Total Processors/Cores/Threads		18x HPE ProLiant DL380 Gen10, 3x HPE ProLiant DL360 Gen10 42/720/1440			
Server Configuration:	Per HPE ProLiant DL380 Gen10: 2x Intel Xeon Gold 6154 @ 3.00GHz 384GB HPE Smart Array P4081-a SR 1x HPE 400GB (5 nodes) 1x HPE 480GB (13 nodes) 1x HPE 800GB 6G SATA SSD 24x HPE 600GB 10K HDD HPE Ethernet 25G Adapter		Per HPE ProLiant DL360 Gen10: 2x Intel Xeon Silver 4116 @ 2.10GHz 192GB HPE Smart Array P4081-a SR 1x HPE 800GB 6G SATA SSD HPE Ethernet 25G Adapter		
Processors					
Memory					
Storage Controller					
Storage Device					
Network					
Connectivity:	HPE 1620-24G Switch (ILO connection) HPE FlexFabric 5950 100/25G (main connection)				



**Hewlett Packard
Enterprise**

**Hewlett Packard Enterprise
ProLiant DL for Big Data**

TPCx-BB Rev. v1.2.0
TPC-Pricing Rev. v2.1.1

Report Date:
July 9, 2017

Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
Server Hardware						
HPE DL360 Gen10 8SFF CTO Server	1	867959-B21	\$2,149	3	\$6,447	
HPE DL360 Gen10 Intel Xeon Silver 4116 CPU @ 2.10GHz	1	874449-B21	\$1,569	3	\$4,707	
HPE DL360 Gen10 Intel Xeon Silver 4116 CPU @ 2.10GHz	1	874449-L21	\$1,569	3	\$4,707	
HPE 16GB 1Rx4 PC4-2666V-R Smart Kit	1	835955-B21	\$589	36	\$21,204	
HPE 800W CS Platinum Plus AC Power Supply	1	865414-B21	\$759	6	\$4,554	
HPE 96W Smart Storage Battery 145mm Cbl	1	875241-B21	\$99	3	\$297	
HPE 800GB 6G SATA MU-2 SFF SC SSD	1	872359-B21	\$1,509	3	\$4,527	
HPE Ethernet 25G Network Adapter	1	Q7M97A	\$999	3	\$2,997	
HPE 3Y FC 24x7 DL360 Gen10 SVC	1	H8QF0E	\$1,565	3		\$4,695
HPE iLO Adv incl 3yr TS U E-LTU	1	E6U64ABE	\$469	3		\$1,407
HP W1972a 18.5-In LED Monitor (1 + 2 spare)	1	B7M13A8#ABA	\$80	3	\$240	
HP PS/2 Keyboard And Mouse Bundle (1 + 2 spare)	1	BIT13AA#ABA	\$28	3	\$84	
			Subtotal		\$49,764	\$6,102
HPE DL380 Gen10 24SFF CTO Server	1	868704-B21	\$2,107	18	\$37,926	
HPE DL380 Gen10 High Perf Fan Kit	1	867810-B21	\$239	18	\$4,302	
HPE DL380 Gen10 2SFF Bay Kit	1	826687-B21	\$149	18	\$2,682	
HPE Intel Xeon Gold 6154 CPU @ 3.00GHz Kit	1	826888-B21	\$4,795	18	\$86,310	
HPE Intel Xeon Gold 6154 CPU @ 3.00GHz Kit	1	826888-L21	\$4,795	18	\$86,310	
HPE 32GB 2Rx4 PC4-2666T-R Kit	1	815100-B21	\$985	216	\$212,760	
HPE 600GB SAS 6G 10K SFF SC DS HDD	1	872477-B21	\$545	432	\$235,440	
HPE 480GB 6G SATA RI-2 SFF SC SSD	1	804593-B21	\$609	13	\$7,917	
HPE 400GB 6G SATA RI-2 SFF SC SSD	1	804665-B21	\$719	5	\$3,595	
HPE 800GB 6G SATA WI-2 SFF SC SSD	1	804671-B21	\$1,389	18	\$25,002	
HPE Smart Array P408i-a SR	1	804331-B21	\$659	18	\$11,862	
HPE 12Gb DL380 Gen10 SAS Expander Card	1	870549-B21	\$699	18	\$12,582	
HPE 800W FS Univ Ht Plg LH Pwr Sply Kit	1	865414-B21	\$516	36	\$18,576	
HPE Ethernet 25G Network Adapter	1	Q7M97A	\$999	18	\$17,982	
HPE 3Y FC 24x7 DL380 Gen10 SVC	1	H8QP7E	\$2,127	18		\$38,286
HPE iLO Adv incl 3yr TS U E-LTU	1	E6U64ABE	\$469	18		\$8,442
			Subtotal		\$763,246	\$46,728



**Hewlett Packard
Enterprise**

**Hewlett Packard Enterprise
ProLiant DL for Big Data**

TPCx-BB Rev. v1.2.0
TPC-Pricing Rev. v2.1.1

Report Date:
July 9, 2017

Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price	
Network							
HPE 1620-24G Switch	1	JG913A	\$299	1	\$299		
HPE FlexFabric 5950 32QSFP28 Switch	1	JH321A	\$34,990	1	\$34,990		
HPE 58x0AF 650W AC Power Supply	1	JC680A	\$749	2	\$1,498		
HPE X712 Fan Tray	1	JH389A	\$149	6	\$894		
CAT6 UTP 1G Ethernet Network Cable 7ft (42 cables)	2	C6-UTPSMPVCYL-2M	\$2	42	\$84		
HPE 100Gb QSFP28 to 4x25Gb SFP28 3m DAC	1	845416-B21	\$699	6	\$4,194		
			Subtotal		\$41,959	\$0	
Rack							
HPE 42U 600x1075mm Adv G2 Kit Plt Rack	1	P9K07A	\$1,699	1	\$1,699		
HPE 24A High Voltage Core Only Corded PDU	1	252663-D74	\$259	2	\$518		
			Subtotal		\$2,217	\$0	
Server Software							
Cloudera Ent Basic Ed 1yr 24x7	1	G7M27A	\$2,304	63	\$145,152		
RHEL Svr 2 Sckt/2 Gst 3yr 24x7 E-LTU	1	G3J30AAE	\$3,889	21	\$81,669		
			Subtotal		\$226,821	\$0	
			Total Extended Price		\$1,084,007	\$52,830	
			Total Discounts (30%)		\$257,155	\$0	
Sales contact: HPE WW Headquarters, 3000 Hanover St., Palo Alto, CA 94304-1185 (650) 857-1501 or HPE: 855-472-5233					Grand Total	\$826,852	\$52,830

Pricing:1 = {Source 1}; 2 = {Source 2} ⁽¹⁾ 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. Audited by Doug Johnson of InfoSizing	Three-Year Cost of Ownership	\$879,682
	BBQ pm@10000	1,491.23
	\$/BBQ pm@10000	\$ 589.91

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. Thank you.



Numerical Quantities

Scale Factor	10000
Streams	2
SUT Validation Test	PASS

Performance Run (Run 2)

Overall Run Start Time	2017-06-26 14:36:26.986
Overall Run End Time	2017-06-27 02:51:05.334
Overall Run Elapsed Time	44,078.348
Load Test Start Time	2017-06-26 14:36:26.987
Load Test End Time	2017-06-26 15:11:59.851
Load Test Elapsed Time	2,132.864
Power Test Start Time	2017-06-26 15:11:59.852
Power Test End Time	2017-06-26 20:04:29.616
Power Test Elapsed Time	17,549.764
Throughput Test Start Time	2017-06-26 20:04:29.616
Throughput Test End Time	2017-06-27 02:51:05.334
Throughput Test Elapsed Time	24,395.718
Performance Metric (BBQpm@ 10000)	1,491.23

Repeatability Run (Run 1)

Overall Run Start Time	2017-06-26 01:34:26.908
Overall Run End Time	2017-06-26 13:46:14.824
Overall Run Elapsed Time	43,907.916
Load Test Start Time	2017-06-26 01:34:26.909
Load Test End Time	2017-06-26 02:09:36.513
Load Test Elapsed Time	2,109.604
Power Test Start Time	2017-06-26 02:09:36.515
Power Test End Time	2017-06-26 07:02:24.536
Power Test Elapsed Time	17,568.021
Throughput Test Start Time	2017-06-26 07:02:24.536
Throughput Test End Time	2017-06-26 13:46:14.824
Throughput Test Elapsed Time	24,230.288
Performance Metric (BBQpm@ 10000)	1,496.35



Performance Run Report (Run 2)

TPCx-BB

Result

v1.2

INFO: T_LOAD = 2132.864

INFO: T_LD = 0.1 * T_LOAD: 213.2864

INFO: T_PT = 11526.0848087096

INFO: T_T_PUT = 24395.718

INFO: T_TT = 12197.859

INFO: === Checking validity of the final result ===

INFO: OK: All required BigBench phases were performed.

INFO: OK: All 30 queries were running in the power test.

INFO: OK: All 30 queries were running in the first throughput test.

INFO: OK: Pretend mode was inactive. All commands were executed.

INFO: === Final result ===

INFO: VALID BBQpm@10000 = 1491.23874722434

Repeatability Run Report (Run 1)

TPCx-BB

Result

v1.2

INFO: T_LOAD = 2109.604

INFO: T_LD = 0.1 * T_LOAD: 210.9604

INFO: T_PT = 11528.6296315375

INFO: T_T_PUT = 24230.288

INFO: T_TT = 12115.144

INFO: === Checking validity of the final result ===

INFO: OK: All required BigBench phases were performed.

INFO: OK: All 30 queries were running in the power test.

INFO: OK: All 30 queries were running in the first throughput test.

INFO: OK: Pretend mode was inactive. All commands were executed.

INFO: === Final result ===

INFO: VALID BBQpm@10000 = 1496.35769773795

Summary details of the run reports are shown above. For the complete run reports, see the Support Files Archive.