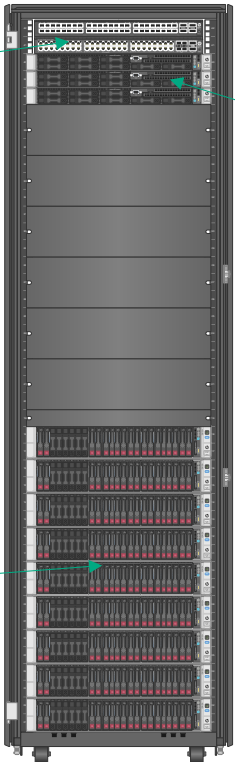
 Hewlett Packard Enterprise		Hewlett Packard Enterprise ProLiant DL for Big Data			TPCx-BB Rev. 1.0.1 TPC-Pricing Rev. 1.7.0	
Total System Cost		TPCx-BB Performance Metric			Report Date: March 23, 2016	
325,156 USD		265.93 BBQpm@3000			1,222.72 USD \$/BBQpm@3000	
Framework	Operating System	Other Software	Availability Date	Scale Factor	Streams	
Cloudera for Apache Hadoop (CDH) 5.6	Red Hat Enterprise Linux Server 6.7	None	March 23, 2016	3000	2	
System Configuration						
Ethernet Switch: HPE 1620-24G Switch (ILO connection) HP5900AF-48XGT-4QSFP+ (main connection)					3 Management Nodes Each: HPE ProLiant DL360 Gen9 2x Intel E5-2640 v3 2.60GHz 1x HPE 480GB SSD 1x HPE 800GB SSD (1 node) 128GB Memory	
9 Worker Nodes Each: HPE ProLiant DL380 Gen9 2x Intel E5-2697 v3 2.60GHz 1x HPE 480GB SSD 16x HPE 1TB HDD 128GB Memory					Software: Red Hat Enterprise Linux 6.7 Cloudera Enterprise 5.6	
Physical Storage/Scale Factor: 50.19			Scale Factor/Physical Memory: 1.95			
Servers:		9x HPE ProLiant DL 380 Gen 9, 3x HPE ProLiant DL360 Gen9				
Total Processors/Cores/Threads		24/300/600				
Server Configuration:	Per HPE ProLiant DL 380 Gen 9:		Per HPE ProLiant DL360 Gen9:			
Processors	2x Intel Xeon E5-2697 v3 @ 2.60GHz		2x Intel Xeon E5-2640 v3 @ 2.60GHz			
Memory	128GB		128GB			
Storage Controller	HPE Smart Array P840/4G		Smart HBA H240ar			
Storage Device	1x HPE 480GB SSD 16x HPE 1 TB HDD		1x HPE 480GB SSD 1x HPE 800GB SSD (1 node)			
Network	HPE Ethernet 10Gb 2P 560FLR-SFP+ Adptr		HPE Ethernet 10Gb 2P 560FLR-SFP+ Adptr			
Connectivity:	HPE 1620-24G Switch, HPE 5900AF-48XG-4QSFP+ Switch					



**Hewlett Packard
Enterprise**

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

TPCx-BB Rev. 1.0.1
TPC-Pricing Rev. 1.7.0

Report Date:
March 23, 2016

Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
Server Hardware						
HPE DL360 Gen9 8SFF CTO Server	1	755258-B21	\$1,797	3	\$5,391	
HPE DL360 Gen9 E5-2640v3 Kit	1	755386-B21	\$1,329	3	\$3,987	
HPE DL360 Gen9 E5-2640v3 FIO Kit	1	755386-L21	\$1,329	3	\$3,987	
HPE 16GB 2Rx4 PC4-2133P-R Kit	1	726719-B21	\$379	24	\$9,096	
HPE Smart Array P440ar/2G FIO Controller	1	749974-B21	\$649	3	\$1,947	
HPE Smart Array P440/4G FIO Controller	1	761872-B21	\$899	3	\$2,697	
HPE 500W FS Plat Ht Plg Pwr Supply Kit	1	720478-B21	\$309	6	\$1,854	
HPE 480GB 6G SATA MU-2 SFF SC SSD	1	832414-B21	\$1,189	3	\$3,567	
HPE 800GB 6G SATA MU-2 SFF SC SSD	1	804671-B21	\$3,038	1	\$3,038	
HPE Ethernet 10Gb 2P 560FLR-SFP+ Adptr	1	665243-B21	\$679	3	\$2,037	
HPE 3Y FC 24x7 DL360 Gen9 SVC	1	U7AL9E	\$1,404	3		\$4,212
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#	\$79	3	\$238	
HP PS/2 Keyboard And Mouse Bundle (1 + 2 spare)	1	B1T13AA#	\$27	3	\$82	
			Subtotal		\$37,920	\$5,619
HPE DL380 Gen9 24SFF CTO Server	1	767032-B21	\$2,107	9	\$18,963	
HPE DL380 Gen9 High Perf Fan Kit	1	719079-B21	\$239	9	\$2,151	
HPE DL380 Gen9 2SFF Bay Kit	1	724864-B21	\$149	9	\$1,341	
HPE DL380 Gen9 Secondary Riser	1	719073-B21	\$99	9	\$891	
HPE DL380 Gen9 E5-2697v3 Kit	1	719055-B21	\$2,599	9	\$23,391	
HPE DL380 Gen9 E5-2697v3 Kit	1	719055-L21	\$2,599	9	\$23,391	
HPE 16GB 2Rx4 PC4-2133P-R Kit	1	726719-B21	\$379	72	\$27,288	
HPE 1TB 6G SATA 7.2k 2.5in SC MDL HDD	1	655710-B21	\$499	144	\$71,856	
HPE 480GB 6G SATA MU-2 SFF SC SSD	1	832414-B21	\$1,189	9	\$10,701	
HPE Smart Array P840/4G Controller	1	726897-B21	\$1,249	9	\$11,241	
HPE 12Gb DL380 Gen9 SAS Expander Card	1	727250-B21	\$699	9	\$6,291	
HPE 800W FS Ti Ht Plg Pwr Supply Kit	1	720482-B21	\$409	18	\$7,362	
HPE Ethernet 10Gb 2P 560FLR-SFP+ Adptr	1	665243-B21	\$679	9	\$6,111	
HPE 3Y FC 24x7 DL380 Gen9 SVC	1	U7AE5E	\$1,821	9		\$16,389
HPE iLO Adv incl 3yr TS U E-LTU	1	E6U64ABE	\$469	9		\$4,221
			Subtotal		\$210,978	\$20,610
Network						
HPE 1620-24G Switch	1	JG913A	\$299	1	\$299	
HPE 5900AF-48XG-4QSFP+ Switch	1	JC772A	\$20,990	1	\$20,990	
HPE 1m Multi-mode OM3 LC/LC FC Cable	1	AJ834A	\$70	12	\$840	
HPE A58x0AF 650W AC Power Supply	1	JC680A	\$749	4	\$2,996	
HPE 58x0AF Bck(pwr)-Frt(ports) Fan Tray	1	JC682A	\$179	4	\$716	
			Subtotal		\$25,841	\$0
Rack						
HPE Universal Rack 11642 1075mm Shock Rack	1	H6J66A	\$1,699	1	\$1,699	
HPE 24A High Voltage Core Only Corded PDU	1	252663-D74	\$259	2	\$518	
			Subtotal		\$2,217	\$0



**Hewlett Packard
Enterprise**

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

TPCx-BB Rev. 1.0.1
TPC-Pricing Rev. 1.7.0

Report Date:
March 23, 2016

Description	Price Key	Part Number	Unit Price	Qty	Extended Price	3 Yr Maint Price
Server Software						
Cloudera Ent Basic Ed 1yr 24x7	1	G7M27A	\$2,304	36	\$82,944	
RHEL Svr 2 Sckt/2 Gst 3yr 24x7 E-LTU	1	G3J30AAE	\$3,889	12	\$46,668	
Subtotal					\$129,612	\$0
Total Extended Price					\$406,568	\$26,229
Total Discounts					\$106,376	\$1,266
Sales contact: HPE WW Headquarters, 3000 Hanover St., Palo Alto, CA 94304-1185 (650) 857-1501 or H-P direct: 800-203-6748		Grand Total			\$300,192	\$24,963

Pricing:1 = HPE

⁽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, Inc.

Three-Year Cost of Ownership **\$325,156**

BBQpm@3000 **265.93**

\$/BBQpm@3000 **\$1,222.72**

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	3000
Streams	2
SUT Validation Status	PASS

Performance Run

Overall Run Start Time	2016-03-12 13:05:16.670
Overall Run End Time	2016-03-13 10:37:51.892
Overall Run Elapsed Time	73,955.222

Load Test Start Time	2016-03-12 13:05:16.671
Load Test End Time	2016-03-12 13:41:59.708
Load Test Elapsed Time	2,203.037

Power Test Start Time	2016-03-12 13:41:59.710
Power Test End Time	2016-03-12 21:20:59.935
Power Test Elapsed Time	27,540.225

Throughput Test Start Time	2016-03-12 21:20:59.936
Throughput Test End Time	2016-03-13 10:37:51.892
Throughput Test Elapsed Time	44,211.956

Performance Metric (BBQpm@SF)	265.93
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Repeatability Run

Overall Run Start Time	2016-03-11 16:44:52.574
Overall Run End Time	2016-03-12 12:39:44.000
Overall Run Elapsed Time	71,691.426

Load Test Start Time	2016-03-11 16:44:52.575
Load Test End Time	2016-03-11 17:21:38.198
Load Test Elapsed Time	2,205.623

Power Test Start Time	2016-03-11 17:21:38.200
Power Test End Time	2016-03-12 00:55:08.677
Power Test Elapsed Time	27,210.477

Throughput Test Start Time	2016-03-12 00:55:08.678
Throughput Test End Time	2016-03-12 12:39:43.999
Throughput Test Elapsed Time	42,275.321

Performance Metric (BBQpm@SF)	272.99
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Run Report – Run 1

```
*****
TPCx-BB
Result
v1.0.1
*****
INFO: T_LOAD = 2205.623
INFO: T_LD = 0.1 * T_LOAD: 220.56230000000002
INFO: T_PT = 18099.997606264762
INFO: T_T_PUT = 42275.321
INFO: T_TT = 21137.6605
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@3000 = 272.99597675236356
```

Run Report – Run 2

```
*****
TPCx-BB
Result
v1.0.1
*****
INFO: T_LOAD = 2203.037
INFO: T_LD = 0.1 * T_LOAD: 220.3037
INFO: T_PT = 18249.03919370655
INFO: T_T_PUT = 44211.956
INFO: T_TT = 22105.978
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@3000 = 265.9385341586281
```

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