New H3C Technologies Co., Limited

TPC Benchmark™ DS

Full Disclosure Report

for

H3C UniServer R4900 G3

using

GBase 8a v9

and

Red Hat Enterprise Linux Server Release 7.8

First Edition

December 23, 2020

First Edition –December 23, 2020

H3C is an industry leader in the provision of Digital Solutions, and is committed to becoming the most trusted partner of its customers in their quest for business innovation and digital transformation. We offer a full portfolio of Digital Infrastructure products, spanning across compute, storage, networking, 5G, security and related domains, and provide a comprehensive one-stop digital platform that includes cloud computing, big data, artificial intelligence (AI), industrial internet, information security, intelligent connectivity, new safety, and edge computing, as well as end-to-end technical services. We are also the exclusive provider of HPE® servers, storage and associated technical services in China.

Abstract

This document contains the methodology and results of the TPC Benchmark™ DS (TPC-DS) test conducted in conformance with the requirements of the TPC-DS Standard Specification, Revision 2.13.0. The test was conducted at a Scale Factor of 10000GB with 8 H3C UniServer R4900 G3 Servers running GBase 8a v9 on Red Hat Enterprise Linux Server Release 7.8.

Measured Configuration

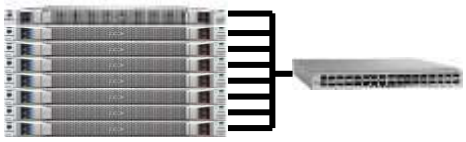
Company Name	Cluster Node	Database Software	Operating System
H3C	UniServer R4900 G3	GBase 8a v9	Red Hat Enterprise Linux Server Release 7.8

TPC Benchmark™ DS Metrics

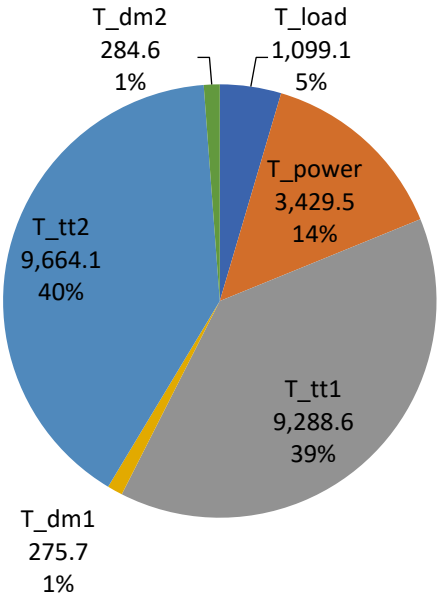
Total System Cost	TPC-DS Throughput	Price/Performance	Availability Date
¥3,784,642RMB	8,944,478 QphDS@10000GB	¥0.43 RMB	23-Dec-2020

H3C The Leader in Digital Solutions	**H3C UniServer R4900 G3**		TPC-DS: 2.13.0 TPC-Pricing: 2.6.0 Report Date: 23-Dec-2020	
Total System Cost	TPC-DS Throughput	Price / Performance	System Available Date	
¥3,784,642 RMB	**8,944,478 QphDS@10000GB**	**¥0.43 RMB**	**23-Dec-2020**	
Dataset Size	Database Manager	Operating System	Other Software	Cluster
10,000 GB	GBase 8a V9	Red Hat Enterprise Linux Server Release 7.8	No	Yes

8 x H3C UniServer R4900 G3, each with:
2 x Intel Xeon Gold 6230R Processor
512 GB DDR4 DRAM
1 x 480GB Sata SSD Drive
6 x 2TB NVMe Drive
1x Intel E810-XXV 25Gb NIC



Benchmarked Configuration



Elapsed Time

Load includes backup = No	RAID = RAID-10
System Configuration	H3C UniServer R4900 G3
Servers:	8 x H3C UniServer R4900 G3
Total Processors/Cores/Threads:	16/416/832
Total Memory:	4,096 GB
Total Storage:	102,144GB
Storage Ratio:	10.22
Connectivity:	1 x Cisco Nexus 3232C Switch
Server Configuration:	Per node
Processors:	2 x Intel Xeon Gold 6230R Processor
Memory:	512 GB
Network:	1x Intel E810-XXV 25Gb NIC
Storage Device:	6 x 2TB NVMe Drive (data disks)

The Leader in Digital Solutions

H3C UniServer R4900 G3

TPC-DS: 2.13.0
TPC-Pricing: 2.6.0
Report Date: 23-Dec-2020

Description	Src	Part Number	Unit Price (RMB)	Qty	Extended Price (RMB)	3 Year Maint. Price
Hardware Components						
H3C UniServer R4900 G3 8SFF CTO Server	1	0235A2CR	9,600	8	76,800	
H3C UniServer R4900 G3 6230R(2.1GHz/26Cores/35.75MB/150W)CPU Module(CMCTO)	1	0231AEEC	36,300	16	580,800	
32GB 2Rx4 DDR4-2933P-R Memory Module(FIO)	1	0231ABDU	3,100	128	396,800	
8SFF HDD Cage Module BAY2(FIO)	1	0231A8QF	600	8	4,800	
8SFF NVMe HDD Cage Module BAY3(FIO)	1	0231A8QE	800	8	6,400	
2TB PCIe*Gen3 X4 NVMe U.2 2.5in RI P4510 SSD General Intelligent Disk Equipment Module(FIO)	1	0231A7P4	10,355	48	497,040	
480GB 6G SATA 2.5in MU S4610 SSD Generic Module-i(FIO)	1	0231AARN	3,380	8	27,040	
FHHL Riser(Slot1/2)(1X16 FHHL and 1X8 FHHL)(FIO)	1	0231A8QR	263	16	4,208	
8 Ports NVMe SSD Expander Module(Supporting 8 NVMe SSD Hard Disks)(FIO)	1	0231A8U5	2,900	8	23,200	
800W AC & 240V HVDC Power Supply(FP-R1-Platinum)(CMCTO)	1	0231A8L0	1,800	16	28,800	
SAS HD Transit Cable,0.71m,SAS HD 72pinS,SAS Cable,2*(SAS HD 36pinA)	1	0404A0U3	170	8	1,360	
OCulink Transit Cable,0.67m,4*(OCulink 42pinS),SAS Cable,4*(OCulink 42pinS)	1	0404A0SX	820	16	13,120	
2U Standard Fan Module(FIO)	1	0231A8QM	100	8	800	
H3C Server Installation and Startup Service	1	8814A0CP	2,118	8	16,944	
3Y 7×24 Remote Technical Support -OS	1	8813A4NA	4,140	8		33,120
H3C RHEL Svr 2Sckt/2Gst 3yr 24x7 LTU	1	3132A05G	43,050	8	344,400	
25G SFP28 Optical Transceiver Module (850nm,100m,SR,MM,LC)	1	0231A7QP	3,100	8	24,800	
Fiber Connector,MTPY(8 core)/PC,4DLC/PC(2.0m),Multimode(OM3),3.0mm,10.0m	1	1413A00H	370	2	740	
QSFP28 100G Optical Transceiver Module(850nm,100m OM4,SR4,MPO)(ODM-T)	1	3407A001	15,000	2	30,000	
CISCO N3K-C3232C 32 ports switch (incl. spares)	4	N3K-C3232C	69,000	3	207,000	
Intel Ethernet Network Adapter E810XXVDA2BLK (incl. spares)	5		2,370	10	23,700	
PDU	3		141	2	282	
Cabinet	3		1,700	1	1,700	
LG 22MK400H 21.5" Monitor	3		699	1	699	
Keyboard & Mouse	3		89	1	89	
			Sub Total		**2,311,522**	**33,120**
Software Componets						
GBase 8a MPP V9 With 1 years 24x7 support	2	GBase 8a MPP	187,500	8	1,500,000	
2 years 24x7 support	2	GBase 8a MPP	240,000	1		240,000
			Sub Total		**1,500,000**	**240,000**
		Total Extended Price			**3,811,522**	**273,120**
		Total Discounts			**300,000**	**0**
Price Key: 1: H3C, 2: GBase, 3: jd.com, 4: Qizhen Electronic, 5: Digital China Group						
Audited by Francois Raab of InfoSizing (www.sizing.com)		**Grand Total**			**3,511,522**	**273,120**
Discount is based on 20% of extended price for GBase licence. Discounts for similarly sized configurations will be similar to those quoted here, but may vary based on the components in the configuration.			**3 year cost of ownership USD:**			**3,784,642**
			QphDS@10000GB			**8,944,478**
			RMB/QphDS@10000GB			**0.43**

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.

Sales Contacts

H3C:
Pengfei Zeng
H3C Technologies Co., Limited
Mobile: +86-18910071300
E-mail: zengpengfei@h3c.com
http://www.h3c.com

GBase:
Shaoyong Zhang
General Data Technology Co. Ltd.
Mobile: +86-13174823772
E-mail: zhangshaoyong@gbase.cn
http://www.gbase.cn

The Leader in Digital Solutions	**H3C UniServer R4900 G3**	TPC-DS: 2.13.0 TPC-Pricing: 2.6.0 Report Date: 23-Dec-2020

Metrics Details:

Name	Value	Unit
Scale Factor (SF)	10,000	GB
Streams	4	Stream
Queries (Q)	396	Queries
T_load	1,099.1	Second
T_ld	0.0123	Hour
T_power	3,429.5	Second
T_pt	3.8106	Hour
T_tt1	9,288.6	Second
T_tt2	9,664.1	Second
T_dm1	275.7	Second
T_dm2	284.6	Second
T_tt	5.2647	Hour
T_dm	0.1557	Hour

Load Step	Start		End		(sec.)	(hh:mm:ss)
Build	12/14/20	22:41:40.88	12/14/20	22:59:59.93	1,099.05	0:18:19
Audit	12/14/20	22:59:59.93	12/14/20	23:18:07.49	1,087.56	0:18:08
Finish	12/14/20	23:18:07.49	12/14/20	23:18:07.49	0.00	0:00:00
Reported	**12/14/20**	**22:41:40.88**	**12/14/20**	**23:18:07.49**	**1,099.05**	**0:18:19**

Test	Start		End		(sec.)	(hh:mm:ss)
Power	12/14/20	23:27:39.49	12/15/20	00:24:48.91	3,429.42	0:57:09
Thruput-1	12/15/20	00:24:48.93	12/15/20	02:59:37.53	9,288.60	2:34:49
DM-1	12/15/20	02:59:37.55	12/15/20	03:04:13.25	275.70	0:04:36
Thruput-2	12/15/20	03:04:13.27	12/15/20	05:45:17.36	9,664.09	2:41:04
DM-2	12/15/20	05:45:17.38	12/15/20	05:50:01.94	284.56	0:04:45

Stream	Start		End		(sec.)	(hh:mm:ss)
Pt - 0	12/14/20	23:27:39.49	12/15/20	00:24:48.91	3,429.42	0:57:09
Tt1 - 1	12/15/20	00:24:48.93	12/15/20	02:57:06.73	9,137.80	2:32:18
Tt1 - 2	12/15/20	00:24:48.93	12/15/20	02:59:37.53	9,288.60	2:34:49
Tt1 - 3	12/15/20	00:24:48.93	12/15/20	02:58:30.93	9,222.00	2:33:42
Tt1 - 4	12/15/20	00:24:48.93	12/15/20	02:59:25.60	9,276.67	2:34:37
Tt2 - 5	12/15/20	03:04:13.27	12/15/20	05:43:44.01	9,570.74	2:39:31
Tt2 - 6	12/15/20	03:04:13.27	12/15/20	05:44:25.93	9,612.66	2:40:13
Tt2 - 7	12/15/20	03:04:13.27	12/15/20	05:45:00.69	9,647.42	2:40:47
Tt2 - 8	12/15/20	03:04:13.27	12/15/20	05:45:17.36	9,664.09	2:41:04
DMt1 - 1	12/15/20	02:59:37.55	12/15/20	03:01:55.16	137.61	0:02:18
DMt1 - 2	12/15/20	03:01:55.16	12/15/20	03:04:13.25	138.09	0:02:18
DMt2 - 3	12/15/20	05:45:17.38	12/15/20	05:47:41.54	144.16	0:02:24
DMt2 - 4	12/15/20	05:47:41.53	12/15/20	05:50:01.94	140.41	0:02:20

Timing Intervals for Queries (in Seconds)

Query	S 0	S 1	S 2	S 3	S 4	Min	25%tile	Median	75%tile	Max	S 5	S 6	S 7	S 8	Min	25%tile	Median	75%tile	Max
1	10.5	75.4	22.8	35.1	33.8	22.8	31.1	34.5	45.2	75.4	45.7	33.3	32.9	48.1	32.9	33.2	39.5	46.3	48.1
2	65.1	138.0	182.7	126.9	189.1	126.9	135.2	160.4	184.3	189.1	166.3	203.4	134.5	102.3	102.3	126.5	150.4	175.6	203.4
3	9.4	20.4	31.2	52.3	39.8	20.4	28.5	35.5	42.9	52.3	22.6	23.4	24.7	13.9	13.9	20.4	23.0	23.7	24.7
4	76.0	264.8	242.5	162.4	258.8	162.4	222.5	250.7	260.3	264.8	341.1	277.6	320.3	240.9	240.9	268.4	299.0	325.5	341.1
5	2.0	13.6	14.5	11.3	7.9	7.9	10.5	12.5	13.8	14.5	21.5	13.1	16.0	10.8	10.8	12.5	14.6	17.4	21.5
6	12.0	45.9	52.5	35.7	30.6	30.6	34.4	40.8	47.6	52.5	22.0	42.4	27.8	27.2	22.0	25.9	27.5	31.5	42.4
7	28.9	55.2	54.4	83.1	53.9	53.9	54.3	54.8	62.2	83.1	59.8	51.3	67.6	58.3	51.3	56.6	59.1	61.8	67.6
8	31.5	100.8	99.8	87.3	63.0	63.0	81.2	93.6	100.1	100.8	72.0	103.5	80.8	98.2	72.0	78.6	89.5	99.5	103.5
9	47.1	100.7	87.7	92.5	79.3	79.3	85.6	90.1	94.6	100.7	116.8	94.7	110.5	103.6	94.7	101.4	107.1	112.1	116.8
10	53.0	135.2	87.8	117.2	157.7	87.8	109.9	126.2	140.8	157.7	176.2	301.4	132.1	293.7	132.1	165.2	235.0	295.6	301.4
11	28.9	107.2	70.7	99.3	108.3	70.7	92.2	103.3	107.5	108.3	142.1	138.3	123.1	163.2	123.1	134.5	140.2	147.4	163.2
12	3.8	24.3	21.4	17.2	11.9	11.9	15.9	19.3	22.1	24.3	8.1	18.2	16.7	18.9	8.1	14.6	17.5	18.4	18.9
13	10.3	39.5	50.5	44.0	24.5	24.5	35.8	41.8	45.6	50.5	117.9	104.1	61.2	69.5	61.2	67.4	86.8	107.6	117.9
14	120.6	270.5	248.0	267.7	295.0	248.0	262.8	269.1	276.6	295.0	218.7	289.3	310.9	271.1	218.7	258.0	280.2	294.7	310.9
15	17.7	77.4	36.6	97.0	66.9	36.6	59.3	72.2	82.3	97.0	40.4	93.9	53.0	42.0	40.4	41.6	47.5	63.2	93.9
16	61.4	140.4	150.8	153.1	169.4	140.4	148.2	152.0	157.2	169.4	168.6	138.4	122.6	88.0	88.0	114.0	130.5	146.0	168.6
17	20.4	47.9	39.3	73.8	44.3	39.3	43.1	46.1	54.4	73.8	40.9	54.3	45.8	47.4	40.9	44.6	46.6	49.1	54.3
18	16.2	70.6	111.5	100.0	160.1	70.6	92.7	105.8	123.7	160.1	80.7	64.0	81.3	120.4	64.0	76.5	81.0	91.1	120.4
19	12.2	52.7	36.2	36.7	32.5	32.5	35.3	36.5	40.7	52.7	34.7	31.2	25.0	31.5	25.0	29.7	31.4	32.3	34.7
20	1.3	4.2	10.3	6.6	7.7	4.2	6.0	7.2	8.4	10.3	12.5	3.6	8.4	6.8	3.6	6.0	7.6	9.4	12.5
21	0.9	6.4	5.4	5.6	8.0	5.4	5.6	6.0	6.8	8.0	3.9	6.4	3.7	6.6	3.7	3.9	5.2	6.5	6.6
22	4.8	9.0	10.0	16.3	9.9	9.0	9.7	10.0	11.6	16.3	11.9	21.9	9.0	15.2	9.0	11.2	13.6	16.9	21.9
23	408.0	744.0	900.5	1,029.0	785.7	744.0	775.3	843.1	932.6	1,029.0	883.1	801.4	1,083.8	1,017.8	801.4	862.7	950.5	1,034.3	1,083.8
24	105.2	264.0	315.3	376.8	408.8	264.0	302.5	346.1	384.8	408.8	420.2	305.6	363.3	327.9	305.6	322.3	345.6	377.5	420.2
25	12.6	40.4	37.4	33.9	34.6	33.9	34.4	36.0	38.2	40.4	32.3	43.2	34.8	27.9	27.9	31.2	33.6	36.9	43.2
26	8.3	23.7	27.1	21.6	19.2	19.2	21.0	22.7	24.6	27.1	24.2	31.1	23.4	23.1	23.1	23.3	23.8	25.9	31.1
27	18.2	72.5	44.9	49.2	34.3	34.3	42.3	47.1	55.0	72.5	61.6	49.0	30.7	45.3	30.7	41.7	47.2	52.2	61.6
28	21.6	110.8	67.6	68.2	62.9	62.9	66.4	67.9	78.9	110.8	87.1	81.6	108.9	84.0	81.6	83.4	85.6	92.6	108.9
29	12.4	30.7	34.2	30.7	38.4	30.7	30.7	32.5	35.3	38.4	41.6	48.9	33.5	45.2	33.5	39.6	43.4	46.1	48.9
30	7.5	21.7	24.0	22.4	37.9	21.7	22.2	23.2	27.5	37.9	34.5	18.4	23.0	55.0	18.4	21.9	28.8	39.6	55.0
31	49.8	119.3	108.8	123.6	119.9	108.8	116.7	119.6	120.8	123.6	105.5	158.5	92.8	82.6	82.6	90.3	99.2	118.8	158.5
32	1.5	4.2	7.1	7.1	5.4	4.2	5.1	6.3	7.1	7.1	6.9	5.5	4.2	6.8	4.2	5.2	6.2	6.8	6.9
33	14.1	51.9	39.3	50.9	42.7	39.3	41.9	46.8	51.2	51.9	64.0	50.4	64.5	54.4	50.4	53.4	59.2	64.1	64.5
34	25.2	68.2	112.1	62.5	49.0	49.0	59.1	65.4	79.2	112.1	53.1	88.8	69.0	80.4	53.1	65.0	74.7	82.5	88.8
35	104.2	284.1	432.7	275.1	233.0	233.0	264.6	279.6	321.3	432.7	251.3	263.3	298.4	293.7	251.3	260.3	278.5	294.9	298.4
36	16.0	24.9	38.8	22.0	37.2	22.0	24.2	31.1	37.6	38.8	43.2	31.3	47.5	38.1	31.3	36.4	40.7	44.3	47.5
37	3.9	11.6	9.2	8.3	16.1	8.3	9.0	10.4	12.7	16.1	6.8	25.8	9.2	9.0	6.8	8.5	9.1	13.4	25.8
38	147.8	337.4	371.0	325.1	485.9	325.1	334.3	354.2	399.7	485.9	465.9	400.9	464.9	440.9	400.9	430.9	452.9	465.2	465.9
39	4.6	13.9	7.9	21.6	22.8	7.9	12.4	17.8	21.9	22.8	13.1	19.1	14.8	23.4	13.1	14.4	17.0	20.2	23.4
40	2.3	3.0	2.4	38.4	13.1	2.4	2.9	8.1	19.4	38.4	12.7	8.5	5.7	7.2	5.7	6.8	7.9	9.6	12.7
41	1.8	16.6	12.1	5.9	12.2	5.9	10.6	12.2	13.3	16.6	13.7	12.7	8.3	14.8	8.3	11.6	13.2	14.0	14.8
42	9.2	21.6	24.0	27.3	24.2	21.6	23.4	24.1	25.0	27.3	22.1	25.0	20.0	30.5	20.0	21.6	23.6	26.4	30.5
43	35.3	95.0	42.8	84.2	101.0	42.8	73.9	89.6	96.5	101.0	118.7	89.7	90.0	64.9	64.9	83.5	89.9	97.2	118.7
44	5.1	25.2	13.5	51.6	51.7	13.5	22.3	38.4	51.6	51.7	30.9	21.7	11.4	25.2	11.4	19.1	23.5	26.6	30.9
45	8.8	32.7	23.1	31.5	33.1	23.1	29.4	32.1	32.8	33.1	27.4	53.9	39.0	37.0	27.4	34.6	38.0	42.7	53.9
46	28.4	88.7	85.6	85.4	95.1	85.4	85.6	87.2	90.3	95.1	100.8	92.3	89.1	103.8	89.1	91.5	96.6	101.6	103.8
47	79.1	146.7	136.9	191.6	171.6	136.9	144.3	159.2	176.6	191.6	239.1	175.2	191.6	161.0	161.0	171.7	183.4	203.5	239.1
48	12.0	40.8	10.0	44.6	20.3	10.0	17.7	30.6	41.8	44.6	40.9	26.7	33.5	19.1	19.1	24.8	30.1	35.4	40.9
49	3.5	12.0	10.2	13.7	15.1	10.2	11.6	12.9	14.1	15.1	13.4	9.1	11.9	11.2	9.1	10.7	11.6	12.3	13.4
50	16.4	44.6	47.5	41.2	42.4	41.2	42.1	43.5	45.3	47.5	63.2	33.0	37.2	33.9	33.0	33.7	35.6	43.7	63.2
51	69.2	222.6	178.6	176.1	188.6	176.1	178.0	183.6	197.1	222.6	122.8	209.1	202.8	264.9	122.8	182.8	206.0	223.1	264.9
52	8.1	22.9	16.2	23.1	13.5	13.5	15.5	19.6	23.0	23.1	28.0	36.5	22.1	21.3	21.3	21.9	25.1	30.1	36.5
53	19.5	47.4	34.3	49.3	39.9	34.3	38.5	43.7	47.9	49.3	52.1	38.3	49.6	47.8	38.3	45.4	48.7	50.2	52.1
54	19.2	59.3	31.8	83.1	60.4	31.8	52.4	59.9	66.1	83.1	86.6	54.9	44.2	63.8	44.2	52.2	59.4	69.5	86.6
55	8.4	23.5	11.2	20.1	18.3	11.2	16.5	19.2	21.0	23.5	20.4	20.6	24.9	25.9	20.4	20.6	22.8	25.2	25.9
56	12.4	58.3	44.8	37.9	49.6	37.9	43.1	47.2	51.8	58.3	54.7	98.3	32.8	68.7	32.8	49.2	61.7	76.1	98.3
57	40.7	77.2	101.2	85.5	93.8	77.2	83.4	89.7	95.7	101.2	85.0	110.2	88.6	92.3	85.0	87.7	90.5	96.8	110.2
58	13.1	44.6	57.0	31.0	46.9	31.0	41.2	45.8	49.4	57.0	34.5	28.5	30.8	43.6	28.5	30.2	32.7	36.8	43.6
59	103.1	230.0	219.7	263.3	258.8	219.7	227.4	244.4	259.9	263.3	223.6	206.1	210.1	205.2	205.2	205.9	208.1	213.5	223.6
60	12.8	87.3	76.2	52.1	61.2	52.1	58.9	68.7	79.0	87.3	35.5	43.2	68.2	44.2	35.5	41.3	43.7	50.2	68.2
61	20.7	66.0	60.2	61.4	68.4	60.2	61.1	63.7	66.6	68.4	71.0	40.7	70.2	68.8	40.7	61.8	69.5	70.4	71.0
62	18.3	45.6	52.1	47.8	45.6	45.6	45.6	46.7	48.9	52.1	39.7	58.1	53.6	57.7	39.7	50.1	55.7	57.8	58.1
63	20.7	41.2	37.2	47.2	51.4	37.2	40.2	44.2	48.3	51.4	56.5	37.7	36.1	19.9	19.9	32.1	36.9	42.4	56.5
64	43.7	242.0	206.8	278.3	190.6	190.6	202.8	224.4	251.1	278.3	224.0	142.6	127.6	188.9	127.6	138.9	165.8	197.7	224.0
65	19.8	55.6	47.8	41.6	49.2	41.6	46.3	48.5	50.8	55.6	37.7	49.0	46.5	56.5	37.7	44.3	47.8	50.9	56.5
66	18.4	58.2	30.4	38.6	49.1	30.4	36.6	43.9	51.4	58.2	52.0	64.0	45.8	48.5	45.8	47.8	50.3	55.0	64.0
67	25.1	68.1	49.1	55.7	73.3	49.1	54.1	61.9	69.4	73.3	79.7	72.3	62.0	76.1	62.0	69.7	74.2	77.0	79.7
68	14.0	80.4	116.4	80.9	38.6	38.6	70.0	80.7	89.8	116.4	59.8	72.1	74.5	53.9	53.9	58.3	66.0	72.7	74.5
69	14.9	4.5	39.3	57.1	44.3	4.5	30.6	41.8	47.5	57.1	8.6	45.6	45.0	35.6	8.6	28.9	40.3	45.2	45.6
70	37.7	94.7	80.3	102.0	73.4	73.4	78.6	87.5	96.5	102.0	87.8	82.2	87.9	73.6	73.6	80.1	85.0	87.8	87.9
71	18.5	51.4	56.5	54.7	42.9	42.9	49.3	53.1	55.2	56.5	48.1	49.9	65.2	45.0	45.0	47.3	49.0	53.7	65.2
72	76.3	186.0	133.0	116.5	162.4	116.5	128.9	147.7	168.3	186.0	155.1	138.2	148.1	190.8	138.2	145.6	151.6	164.0	190.8
73	15.5	38.6	55.1	48.8	60.2	38.6	46.3	52.0	56.4	60.2	85.7	62.8	66.7	51.7	51.7	60.0	64.8	71.5	85.7
74	98.4	295.1	258.4	243.1	242.2	242.2	242.9	250.8	267.6	295.1	277.3	246.9	282.8	299.3	246.9	269.7	280.1	286.9	299.3
75	342.1	776.8	970.6	898.9	781.1	776.8	780.0	840.0	916.8	970.6	910.9	871.5	878.2	923.6	871.5	876.5	894.6	914.1	923.6
76	3.9	13.0	14.9	9.3	21.1	9.3	12.1	14.0	16.5	21.1	10.6	18.2	11.4	13.9	10.6	11.2	12.7	15.0	18.2
77	14.1	43.8	52.7	56.4	57.2	43.8	50.5	54.6	56.6	57.2	64.7	68.3	69.9	61.9	61.9	64.0	66.5	68.7	69.9
78	53.2	236.5	175.8	137.6	167.1	137.6	159.7	171.5	191.0	236.5	45.1	174.9	176.5	188.0	45.1	142.5	175.7	179.4	188.0
79	33.2	149.8	99.1	90.0	136.0	90.0	96.8	117.6	139.5	149.8	85.7	114.5	118.4	128.7	85.7	107.3	116.5	121.0	128.7
80	2.2	31.9	2.2	17.1	26.2	2.2	13.4	21.7	27.6	31.9	16.5	10.0	10.5	20.2	10.0	10.4	13.5	17.4	20.2
81	6.8	38.9	23.7	43.7	49.0	23.7	35.1	41.3	45.0	49.0	23.5	25.3	42.1	22.8	22.8	23.3	24.4	29.5	42.1
82	8.8	21.9	20.3	16.1	16.5	16.1	16.4	18.4	20.7	21.9	22.9	18.4	31.4	26.8	18.4	21.8	24.9	28.0	31.4
83	6.7	26.6	24.3	20.0	49.2	20.0	23.2	25.5	32.3	49.2	23.6	23.9	25.6	22.7	22.7	23.4	23.8	24.3	25.6
84	2.6	11.9	14.3	6.4	6.9	6.4	6.8	9.4	12.5	14.3	14.5	11.9	9.7	12.0	9.7	11.4	12.0	12.6	14.5
85	6.8	21.8	20.8	31.1	11.0	11.0	18.4	21.3	24.1	31.1	29.0	28.8	26.5	21.9	21.9	25.4	27.7	28.9	29.0
86	7.7	24.8	25.6	18.8	33.8	18.8	23.3	25.2	27.7	33.8	28.0	27.9	27.1	28.4	27.1	27.7	28.0	28.1	28.4
87	146.4	366.9	530.3	336.8	385.6	336.8	359.4	376.3	421.8	530.3	451.2	415.3	464.4	329.1	329.1	393.8	433.3	454.5	464.4
88	26.8	71.8	79.0	60.0	47.7	47.7	56.9	65.9	73.6	79.0	66.1	70.0	63.9	61.6	61.6	63.3	65.0	67.1	70.0
89	21.8	49.4	61.9	33.1	39.6	33.1	38.0	44.5	52.5	61.9	71.9	56.6	54.6	72.9	54.6	56.1	64.3	72.2	72.9
90	4.9	16.5	18.2	22.4	10.5	10.5	15.0	17.4	19.3	22.4	12.1	14.5	10.9	21.8	10.9	11.8	13.3	16.3	21.8
91	5.8	16.4	31.7	21.4	11.1	11.1	15.1	18.9	24.0	31.7	6.5	27.4	20.3	12.7	6.5	11.2	16.5	22.1	27.4
92	11.4	40.4	48.8	48.7	44.1	40.4	43.2	46.4	48.7	48.8	37.5	39.5	34.3	41.9	34.3	36.7	38.5	40.1	41.9
93	14.7	2.5	26.3	33.7	61.4	2.5	20.4	30.0	40.6	61.4	34.7	56.6	32.7	32.7	32.7	32.7	33.7	40.2	56.6
94	28.2	61.4	69.9	30.0	71.6	30.0	53.6	65.7	70.3	71.6	63.7	58.1	83.2	65.0	58.1	62.3	64.4	69.6	83.2
95	10.6	24.4	38.1	37.3	10.2	10.2	20.9	30.9	37.5	38.1	51.0	34.7	24.1	32.8	24.1	30.6	33.8	38.8	51.0
96	11.3	12.3	30.1	19.3	24.5	12.3	17.6	21.9	25.9	30.1	20.2	23.5	22.1	19.5	19.5	20.0	21.2	22.5	23.5
97	75.9	203.4	158.5	154.3	182.7	154.3	157.5	170.6	187.9	203.4	153.0	232.2	191.2	202.8	153.0	181.7	197.0	210.2	232.2
98	9.8	37.6	25.8	25.6	49.1	25.6	25.8	31.7	40.5	49.1	27.8	22.8	57.3	29.1	22.8	26.6	28.5	36.2	57.3
99	31.5	75.6	69.8	85.2	85.5	69.8	74.2	80.4	85.3	85.5	63.2	72.0	56.6	75.6	56.6	61.6	67.6	72.9	75.6

Timing Intervals for Refresh Functions (in Seconds)

DM Fx	R-Run 1	R-Run 2	R-Run 3	R-Run 4	Min	25%tile	Median	75%tile	Max
DF_CS	22.7	22.4	24.4	25.0	22.4	22.7	23.6	24.6	25.0
DF_I	8.4	7.8	8.7	8.0	7.8	8.0	8.2	8.5	8.7
DF_SS	54.0	53.9	57.9	54.2	53.9	54.0	54.1	55.1	57.9
DF_WS	23.3	22.5	24.5	25.4	22.5	23.1	23.9	24.7	25.4
LF_CR	52.4	49.2	52.4	53.0	49.2	51.6	52.4	52.5	53.0
LF_CS	57.4	57.8	58.7	60.0	57.4	57.7	58.3	59.0	60.0
LF_I	13.2	13.4	15.2	12.5	12.5	13.1	13.3	13.8	15.2
LF_SR	44.0	35.8	37.7	39.8	35.8	37.2	38.8	40.9	44.0
LF_SS	50.5	47.6	54.9	53.1	47.6	49.8	51.8	53.5	54.9
LF_WR	50.1	50.2	50.3	49.3	49.3	49.9	50.2	50.2	50.3
LF_WS	54.4	57.6	56.5	53.7	53.7	54.2	55.5	56.8	57.6

Preface

TPC Benchmark™ DS Overview

The TPC Benchmark™DS (TPC-DS) is a decision support benchmark that models several generally applicable aspects of a decision support system, including queries and data maintenance. The benchmark provides a representative evaluation of the System Under Test's (SUT) performance as a general purpose decision support system.

This benchmark illustrates decision support systems that:

- Examine large volumes of data;
- Give answers to real-world business questions;
- Execute queries of various operational requirements and complexities (e.g., ad-hoc, reporting, iterative OLAP, data mining);
- Are characterized by high CPU and IO load;
- Are periodically synchronized with source OLTP databases through database maintenance functions.
- Run on "Big Data" solutions, such as RDBMS as well as Hadoop/Spark based systems.

A benchmark result measures query response time in single user mode, query throughput in multi user mode and data maintenance performance for a given hardware, operating system, and data processing system configuration under a controlled, complex, multi-user decision support workload

The purpose of TPC benchmarks is to provide relevant, objective performance data to industry users. To achieve that purpose, TPC benchmark specifications require benchmark tests be implemented with systems, products, technologies and pricing that:

a) Are generally available to users;

b) Are relevant to the market segment that the individual TPC benchmark models or represents (e.g., TPC-DS models and represents complex, high data volume, decision support environments);

c) Would plausibly be implemented by a significant number of users in the market segment modeled or represented by the benchmark.

In keeping with these requirements, the TPC-DS database must be implemented using commercially available data processing software, and its queries must be executed via SQL interface

The use of new systems, products, technologies (hardware or software) and pricing is encouraged so long as they meet the requirements above. Specifically prohibited are benchmark systems, products, technologies or pricing (hereafter referred to as implementations") whose primary purpose is performance optimization of TPC benchmark

results without any corresponding applicability to real-world applications and environments. In other words, all "benchmark special" implementations, which improve benchmark results but not real-world performance or pricing, are prohibited.

TPC benchmark results are expected to be accurate representations of system performance. Therefore, there are specific guidelines that are expected to be followed when measuring those results. The approach or methodology to be used in the measurements are either explicitly described in the specification or left to the discretion of the test sponsor. When not described in the specification, the methodologies and approaches used must meet the following requirements:

a) The approach is an accepted engineering practice or standard;
b) The approach does not enhance the result;
c) Equipment used in measuring the results is calibrated according to established quality standards;
d) Fidelity and candor is maintained in reporting any anomalies in the results, even if not specified in the benchmark requirements.

Further information is available at www.tpc.org

General Items

0.1 Test Sponsor

A statement identifying the benchmark sponsor(s) and other participating companies must be provided.

This benchmark was sponsored by New H3C Technologies.

0.2 Parameter Settings

Settings must be provided for all customer-tunable parameters and options which have been changed from the defaults found in actual products, including by not limited to:

- *Database Tuning Options*
- *Optimizer/Query execution options*
- *Query processing tool/language configuration parameters*
- *Recovery/commit options*
- *Consistency/locking options*
- *Operating system and configuration parameters*
- *Configuration parameters and options for any other software component incorporated into the pricing structure*
- *Compiler optimization options*

This requirement can be satisfied by providing a full list of all parameters and options, as long as all those which have been modified from their default values have been clearly identified and these parameters and options are only set once.

The Supporting File Archive contains the Operating System and DBMS parameters used in this benchmark.

0.3 Configuration Diagrams

Diagrams of both measured and priced configurations must be provided, accompanied by a description of the differences. This includes, but is not limited to:

- *Number and type of processors*
- *Size of allocated memory, and any specific mapping/partitioning of memory unique to the test.*
- *Number and type of disk units (and controllers, if applicable).*
- *Number of channels or bus connections to disk units, including their protocol type.*
- *Number of LAN (e.g. Ethernet) Connections, including routers, workstations, terminals, etc., that were physically used in the test or are incorporated into the pricing structure.*
- *Type and the run-time execution location of software components (e.g., DBMS, query processing tools/languages, middle-ware components, software drivers, etc.)*

Measured Configuration

The measured configuration consisted of:

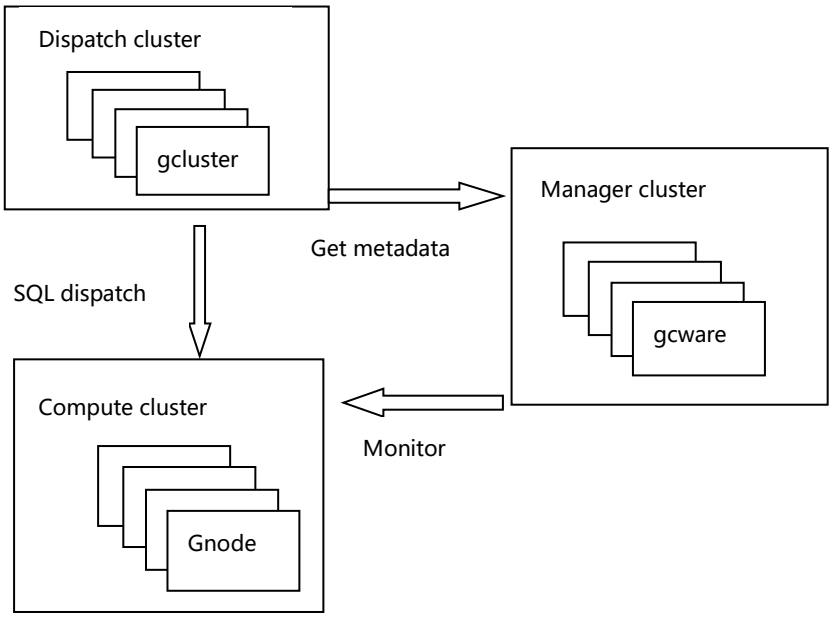
- Total Nodes: 8
- Total Processors/Cores/Threads: 16/416/832
- Total Memory: 4,096 GB
- Total Storage Capacity: 102,144 GB

Server nodes detail:

8 x H3C UniServer R4900 G3, each with:

- Processors/Cores/Threads: 2/52/104
- Processor Model: 2 x Intel Xeon Gold 6230R Processor
- Memory: 512 GB
- Storage Devices:
  - ✓ 6 x 2TB NVMe Drive (data disks)
  - ✓ 1 x 480 GB Sata SSD (boot disk)
- Network: 1x Intel E810-XXV 25Gb NIC

GBase 8a Logical architecture



Priced Configuration

There are no differences between the priced and measured configurations.

GBase 8a Component Configurations

Node	Gcluster	Gcware	Gnode
1-8	1	1	4

NOTE: In this table, gcluster, gcware, gnode are software services，not hardware nodes. We configure one gcluster，one gcware and four gnode services on one hardware node. The dispatch cluster include 8 gcluster services, manager cluster include 8 gcware services, compute cluster include 32 gnode services on 8 nodes.

Clause 2: Logical Database Design

2.1 Database Definition Statements

Listings must be provided for the DDL scripts and must include all table definition statements and all other statements used to set-up the test and qualification databases.

The Supporting File Archive contains the table definitions and all other statements used to set up the test and qualification databases.

2.2 Physical Organization

The physical organization of tables and indices within the test and qualification databases must be disclosed. If the column ordering of any table is different from that specified in Clause2.3 or 2.4, it must be noted.

There is no partition used and default column order used.

2.3 Horizontal Partitioning

If any directives to DDLs are used to horizontally partition tables and rows in the test and qualification databases, these directives, DDLs, and other details necessary to replicate the partitioning behavior must be disclosed.

We use some column as hash key to distribute data on all nodes. They are i_item_sk on item, c_customer_sk on customer, sr_item_sk on store_returns, inv_item_sk on inventory, cr_item_sk on catalog_returns, wr_order_number on web_returns, ws_order_number on web_sales, cs_item_sk on catalog_sales and ss_item_sk on store_sales.

2.4 Replication

Any replication of physical objects must be disclosed and must conform to the requirements of Clause 2.5.3.

No physical object was replicated.

Clause 3: Scaling and Database Population

3.1 Initial Cardinality of Tables

The cardinality (e.g., the number of rows) of each table of the test database, as it existed at the completion of the database load (see Clause 7.1.2) must be disclosed.
Table 3.1 lists the cardinality of each table as they existed upon completion of the build.

Table 3.1 Initial Number of Rows

Table Name	Row Count
call_center	54
catalog_page	40,000
catalog_returns	1,440,033,112
catalog_sales	14,399,964,710
customer	65,000,000
customer_address	32,500,000
customer_demographics	1,920,800
date_dim	73,049
household_demographics	7,200
income_band	20
inventory	1,311,525,000
item	402,000
promotion	2,000
reason	70
ship_mode	20
store	1,500
store_returns	2,879,857,849
store_sales	28,800,162,954
time_dim	86,400
warehouse	25
web_page	4,002
web_returns	720,020,485
web_sales	7,199,963,324
web_site	78

3.2 Distribution of Tables and Logs Across Media

The distribution of tables and logs across all media must be explicitly described using a format similar to that shown in the following example for both the tested and priced systems.

Server Node	Device Type	Volume	Content
1-8	Local SATA SSD	/dev/sda	Operating system, root, swap
	Local NVMe	/dev/md0(/dev/nvme[0-5]n1p1 (Soft RAID 10)	GBase 8a ,Logs, Tables, Temp

All the base Tables were stored on local storage.

3.3 Mapping of Database Partitions/Replications

The mapping of database partitions/replications must be explicitly described.

Neither database partitions nor replications were mapped to specific devices.

3.4 Implementation of RAID

Implementations may use some form of RAID. The RAID level used must be disclosed for each device. If RAID is used in an implementation, the logical intent of its use must be disclosed.

For each node, a soft RAID10 volume is created on six PCIe NVMe drives using the mdadm command and all GBase data is stored in this volume.

3.5 DBGEN Modifications

The version number (i.e., the major revision number, the minor revision number, and third tier number) of dsdgen must be disclosed. Any modifications to the dsdgen source code (see Appendix B:) must be disclosed. In the event that a program other than dsdgen was used to populate the database, it must be disclosed in its entirety.

Dsdgen version v2.13.0 was used. No changes were made to the dsdgen tool.

3.6 Database Load time

The database load time for the test database (see Clause 7.4.3.7) must be disclosed.

The database load time was 1,099.1 seconds.

3.7 Data Storage Ratio

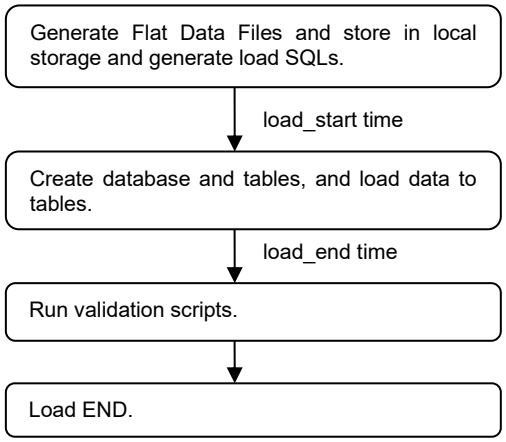
The data storage ratio must be disclosed. It is computed by dividing the total data storage of the priced configuration (expressed in GB) by SF corresponding to the scale factor chosen for the test database as defined in Clause 3.1. The ratio must be reported to the nearest 1/100th, rounded up.

Total Storage Capacity (8 Local nodes) = 8*(2048GB*6+480GB) = 102,144 GB
The data storage ratio is 102,144 / 10,000 = 10.22

3.8 Database Load Mechanism Details

The details of the database load must be disclosed, including a block diagram illustrating the overall process. Disclosure of the load procedure includes all steps, scripts, input and configuration files required to completely reproduce the test and qualification databases.

The database was built as shown in Figure 3.8. All of the related source code and scripts are included in the Supporting Files.



The final database load time is calculated as (load end time – load start time)

3.9 Qualification Database Configuration

Any differences between the configuration of the qualification database and the test database must be disclosed.

The qualification database was built using the same DDL as the test database with the following exceptions:

- The Scale factor is adjusted to1 GB
- The generate script is not parallel run on all nodes，generate 1GB qualification data on one node.

All of the related source code and scripts are included in the Supporting Files

Clauses 4 and 5: Query and Data Maintenance

4.1 Query Language

The query language used to implement the queries must be identified.

SQL was the query language used to implement the queries.

4.2 Verifying Random Number Generation

The method of verification for the random number generation must be described unless the supplied dsdgen and dsqgen were used.

TPC-supplied dsdgen version 2.13.0 and dsqgen version 2.13.0 were used.

4.3 Generating Values for Substitution Parameters

The method used to generate values for substitution parameters must be disclosed. The version number (i.e., the major revision number, the minor revision number, and third tier number) of dsqgen must be disclosed.

TPC supplied dsqgen version 2.13.0 was used to generate the substitution parameters, as follows:
./dsqgen -streams $stream -input ../query_templates/templates.lst -directory ../query_templates -dialect gbase -scale $TPCDS_SCALE -rngseed $SEED -verbose y - output_dir $STREAM_TMP

4.4 Query Text Minor Modifications

The executable query text used for query validation must be disclosed along with the corresponding output data generated during the execution of the query text against the qualification database. If minor modifications have been applied to any functional query definitions or approved variants in order to obtain executable query text, these modifications must be disclosed and justified. The justification for a particular minor query modification can apply collectively to all queries for which it has been used. The output data for the power and Throughput Tests must be made available electronically upon request.

Supporting Files Archive contains the actual query text and query output. Following are the modifications to the query.

The following MQM are used:
- Use sub-query alias (MQM e.1)
  Q2, Q14, Q23, Q49
- Use vendor-specific syntax of date expressions. (MQM f.1)
  Q5, Q12, Q16, Q20, Q21, Q32, Q37, Q40, Q77, Q80, Q82, Q92, Q94, Q95, Q98

- Use column references expression in ORDER BY clause (MQM e.2)
  Q36, Q70, Q86
- Use internal result table to hold the result set for Q64

The Supporting Files Archive contains the full set of executable query text template used in the test.

4.5 Query Substitution Parameters and Seeds Used

All the query substitution parameters used during the performance test must be disclosed in tabular format, along with the seeds used to generate these parameters.

The Supporting Files Archive contains the query substitution parameters and seed used in the test.

4.6 Refresh Setting

All query and refresh session initialization parameters, settings and commands must be disclosed.

The Supporting Files Archive contains the query and scripts.

4.7 Source Code of Refresh Functions

The details of how the data maintenance functions were implemented must be disclosed (including source code of any non-commercial program used).

The Supporting Files Archive contains the source code implementing the refresh functions.

4.8 Staging Area

Any object created in the staging area (see Clause 5.1.8 for definition and usage restrictions) used to implement the data maintenance functions must be disclosed. Also, any disk storage used for the staging area must be priced, and any mapping or virtualization of disk storage must be disclosed.

The staging area is not used.

Clause 6: Data Persistence Properties

The results of the data accessibility tests must be disclosed along with a description of how the data accessibility requirements were met.

The data accessibility test was performed by failing the local storage of one node. This failure was induced during the execution of the first data maintenance test. The storage on each nodes made of 6 PCIe NVMe. The storage failure was simulated by removing access to 1 of the PCIe NVMe. The Supporting Files Archive contains the logs of status before and after the storage failures.

Clause 7: Performance Metrics and Execution Rules

7.1 System Activity

Any system activity on the SUT that takes place between the conclusion of the load test and the beginning of the performance test must be fully disclosed including listings of scripts or command logs.

The only activity between the end of the load test and the beginning of the performance test was the generation of the executable query text.

7.2 Test Steps

The details of the steps followed to implement the performance test must be disclosed.

The Supporting Files Archive contains the scripts and logs.

7.3 Timing Intervals for Each Query and Refresh Function

The timing intervals defined in Clause 7 must be disclosed.

See the Executive Summary at the beginning of this report.

7.4 Throughput Test Result

For each Throughput Test, the minimum, the 25th percentile, the median, the 75th percentile, and the maximum times for each query shall be reported.

See the Executive Summary at the beginning of this report.

7.5 Time for Each Stream

The start time and finish time for each query stream must be reported.

See the Executive Summary at the beginning of this report.

7.6 Time for Each Refresh Function

The start time and finish time for each data maintenance function in the refresh run must be reported for the Throughput Tests.

See the Executive Summary at the beginning of this report.

7.7 Performance Metrics

The computed performance metric, related numerical quantities and the price/performance metric must be reported.

QphDS@10000GB = 8,944,478
See the Executive Summary at the beginning of this report for more detail.

Clause 8: SUT and Driver Implementation

8.1 Driver

A detailed textual description of how the driver performs its functions, how its various components interact and any product functionalities or environmental settings on which it relies must be provided. All related source code, scripts and configuration files must be disclosed. The information provided should be sufficient for an independent reconstruction of the driver.

The GBASE client was used to submit the queries. It connects to the GCLUSTER instance.
The command run a SQL file:

```
gccli -h${host} -P${port} -uroot -Dtpcds -c -f < SQL.sql
```

The command run a SQL command:

```
gccli -h${host} -P${port} -uroot -Dtpcds -c -e "SQL command"
```

The GCLUSTER instance accepts SQL queries from the GBASE clients and processes the queries. All queries are compiled on the GCLUSTER Coordinator node and then dispatched to the GNODE worker nodes as distributed tasks. When the tasks finish, their result is collected by the Coordinator which sends the query output to the GBASE client.
The Supporting Files Archive contains all the command, scripts and logs.

8.2 Implementation Specific Layer(ISL)

If an implementation specific layer is used, then a detailed description of how it performs its functions, how its various components interact and any product functionalities or environmental setting on which it relies must be provided. All related source code, scripts and configuration files must be disclosed. The information provided should be sufficient for an independent reconstruction of the implementation specific layer.

No Implementation Specific Layer was used.

8.3 Profile-Directed Optimization

If profile-directed optimization as described in Clause 7.2.10 is used, such use must be disclosed. In particular, the procedure and any scripts used to perform the optimization must be disclosed.

Profile-directed optimization was not used.

Clause 9: Pricing

9.1 Hardware and Software Used

A detailed list of hardware and software used in the priced system must be reported. The rules for pricing are included in the current revision of the TPC Pricing Specification located on the TPC website (http://www.tpc.org)

A detailed list of all licensed services, hardware and software, is provided in the Executive Summary of this report.

9.2 Availability Date

The System Availability Date (see Clause 7.6.5) must be the single availability date reported on the first page of the executive summary. The full disclosure report must report Availability Dates individually for at least each of the categories for which a pricing subtotal must be. All Availability Dates required to be reported must be disclosed to a precision of 1 day, but the precise format is left to the test sponsor.

The total system is available as of the date of this report.

9.3 Country-Specific Pricing

Additional Clause 7 related items may be included in the full disclosure report for each country specific priced configuration.

The configuration is priced in RMB for the China market.

9.4 Third Party Quotes

GBase Quote

New H3C Technologies Co., Ltd
Located in 466 Changhe Road, Zhijiang Science Park, Hangzhou, China

GBASE®

Here is the information you requested regarding pricing for GBase 8a MPP products to be used in conjunction with your TPC-DS benchmark testing.
All pricing shown is in RMB(￥)

Part Code	Description	Unit Price	Quantity	Discount	Support	Extended Price
GBase 8a MPP	GBase 8a MPP V9 With 1 years 24x7 support	￥187500 per node	8	20%	20% 2 years 24x7 support	￥1,440,000

Zhangshaoyong(GBase Manager of Data Intelligence Product Operation Department)
zhangshaoyong@gbase.cn

Digital China Group Quote

Here is the information you requested regarding pricing to Intel® Ethernet Network Adapter E810XXVDA2 MM: 978331.

All pricing shown is RMB: 2370.00

Part Code	Description	Unit Price	Quantity	Total
E810-XXVDA2 MM: 978331	Intel® Ethernet Network Adapter	￥: 2370.00	8	￥: 18960

Dec 21, 2020

Zhang Xiangyu

Zhangxyas@digitalchina.com

Digital China Group Co., Ltd

Digital China Science and Technology Park, 111 Fuquan Road, Changning District, Shanghai

Tel:021-22019765 Fax:021-22019930

www.digitalchina.com

Qizhen Electronic Quote

上海启臻电子有限公司
Shanghai Qizhen Electronic Co., Ltd.
No.318 Line 388 Du Shi Road, Shanghai, PRC 201100
TEL: +86 (21) 54570227

日期(Date): 2020年(Y) 12 月(M) 18 日(D)
发信人(From): Qzelc.Service@qzelc.com

报价 QUOTATION **Vendor Code:1000011156**

No.	Part Number	Products&Services	Price	QTY	Total	Warranty	Lead Time (working days)
1	N3K-C3232C	CISCO N3K-C3232C 32 ports switch	69000.00	1	69000.00	1year	15
				Total	¥69,000.00		

Terms and Conditions

1 以上价格以人民币(RMB)按相关数量呈报，包含专用增值税发票
Prices quoted are in RMB and based on the stated quantity,include VAT
2 交货地址:北京
Delivery Address:Beijing
3 交货周期: 25 工作日(标准),有现货可以提前交
Lead time: 25 working days,advance with stock
4 报价有效期: 5日
Validity of Quotation: 5 days

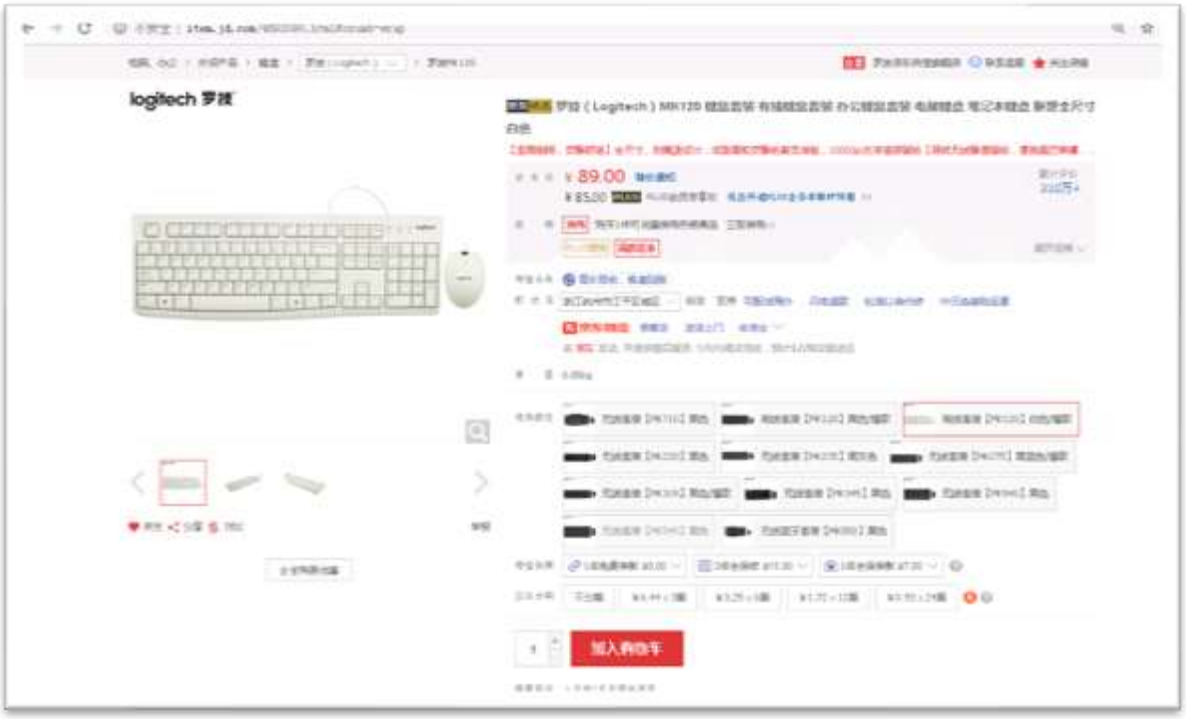
QZelc Beijing Branch
Rm. 412, Building 6, Beijing XiangSu No.2 Wukigiao Street Chaoyang District Beijing, PRC
Office: +86 (10) 57572887 FAX:+86 (10) 57572887-1016

QZelc Chengdu Branch
Room 1102 No.27 shuncheng Street JinjiangDistrict,Chengdu,610000,PRC
Office: +86 (28) 8626 2721 FAX:+86 (28) 8626 2722

QZelc Shenzhen Branch
Rm. 1217, Gelin Wangyuan Bldg., 96 Yannan Rd., Futian Dist., Shenzhen, Guangdong, PRC 518031
Office: +86 (755) 8326 5701 FAX:+86 (755) 8839 1915

QZelc Dalian Branch
Rm. 1807, Block A, Kai Xuan International BLDG, No 129 Jinma Road, Kaifa District, Dalian, PRC 116600
Office: +86 (411) 3926 7085

Jd.com Quotes




京东工业品
麦森特 MAXCENT
京东自营官方旗舰店
机房设备 一站式购齐
镇店之宝
点击抢购
麦森特 MAXCENT
¥1700.00
加入购物车


¥ 141.00
加入购物车

Clause 11: Audit

9.1 Auditors' Report

The auditor's agency name, address, phone number, and Attestation letter with a brief audit summary report indicating compliance must be included in the full disclosure report. A statement should be included specifying who to contact in order to obtain further information regarding the audit process.

This implementation of the TPC Benchmark™ H was audited by Francois Raab of InfoSizing, a certified TPC-DS auditor. Further information regarding the audit process may be obtained from:

Francois Raab
InfoSizing (www.sizing.com)
20 Kreg Ln.
Manitou Springs, CO 80829
(719) 473-7555

TPC Benchmark™ DS Full Disclosure Report and other information can be downloaded from the Transaction Processing Performance Council web site at www.tpc.org.

The Auditor's Letter of Attestation is included below:

InfoSizing

TPC Certified Auditor

Benchmark sponsor: Guoliang Zheng, Director
New H3C Technologies Co., Ltd.
No. 466 Changhe Road, Binjiang District,
Hangzhou, Zhejiang 310052
P.R. China

December 22, 2020

I verified the TPC Benchmark™ DS (TPC-DS™ v2.13.0) performance of the following configuration:

Platform:	H3C UniServer R4900 G3
Operating System:	Red Hat Enterprise Linux Server Release 7.8
Database Manager:	GBase 8a v9

The results were:

Performance Metric	**8,944,478 QphDS@10000GB**
Database Load Time	18m 19s

Servers	**H3C UniServer R4900 G3**		
8 x R4900 G3, each with:			
CPUs	2 x Intel Xeon Gold 6230R (2.1Ghz, 26 Cores)		
Memory	512 GB		
Storage	***Qty***	***Size***	***Type***
	6	2,048 GB	PCIe NVMe
	1	480 GB	SATA SSD

In my opinion, these performance results were produced in compliance with the TPC requirements for the benchmark.

The following verification items were given special attention:

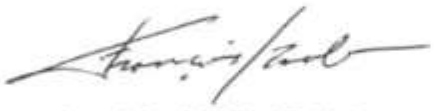
- The database records were defined with the proper layout and size
- The database population was generated using Dsdgen
- The database was properly scaled to 10,000GB and populated accordingly
- The database load time was correctly measured and reported

- The query templates were produced using approved minor query modifications and query variants
- The query input variables were generated by Dsqgen
- The execution of the queries against the qualification database produced compliant output
- The tests were driven and sequenced according to the requirements
- The throughput tests involved 4 query streams
- The execution times for queries and data maintenance functions were correctly measured and reported
- The data accessibility test was performed and verified
- The system pricing was verified for major components and maintenance
- The major pages from the FDR were verified for accuracy

Additional Audit Notes:

None.

Respectfully Yours,



François Raab, TPC Certified Auditor

20 Kreg Lane • Manitou Springs, CO 80829 • 719-473-7555 • www.sizing.com

Supporting Files Index

Clause	Description	Archive File Pathname
Clause 3	Tools for data generation, pre-generated SQL to load base tables	SupportingFiles/Clause_3/generate_data.sh SupportingFiles/Clause_3/doDatagen.sh SupportingFiles/Clause_3/logs/generate_data.log SupportingFiles/Clause_3/sqls/loadsql/
	Scripts and logs for load base tables	SupportingFiles/Clause_3/doLoad.sh SupportingFiles/Clause_3/sqls/ddl.sql SupportingFiles/Clause_3/logs/load_tpcds_time.log SupportingFiles/Clause_3/logs/load_tpcds.out SupportingFiles/Clause_3/logs/create_tpcds_tables.out
	Scripts and SQL for validation and log files	SupportingFiles/Clause_3/doValidate.sh SupportingFiles/Clause_3/sqls/count_tables.sql SupportingFiles/Clause_3/sqls/desc_tables.sql SupportingFiles/Clause_3/sqls/Validate_Data.sql SupportingFiles/Clause_3/sqls/Check_Insert.sql SupportingFiles/Clause_3/sqls/Check_RI.sql SupportingFiles/Clause_3/sqls/create_tpcds_vld.sql SupportingFiles/Clause_3/sqls/load_vld.sql SupportingFiles/Clause_3/logs/row_count.out SupportingFiles/Clause_3/logs/table_schema.out SupportingFiles/Clause_3/logs/validate_data.log SupportingFiles/Clause_3/logs/Check_Insert.log SupportingFiles/Clause_3/logs/Check_RI.log
	pre-generated SQL to data maintenance and output	SupportingFiles/Clause_3/sqls/mtsqls SupportingFiles/Clause_3/logs/fetch*.out
Clause 4	The script to execute qualification test and log file	SupportingFiles/Clause_4/doQualification_test.sh SupportingFiles/Clause_4/logs/qualification.log SupportingFiles/Clause_4/logs/qual_*.out
	SQL for qualification queries	SupportingFiles/Clause_4/queries/
	Output from executing qualification queries	SupportingFiles/Clause_4/output/
	Query templates modify	SupportingFiles/Clause_4/query_templates_modify/ SupportingFiles/Clause_4/gbase.tpl
Clause 5	Data maintenance execution scripts and logs files for each stream [s]	SupportingFiles/Clause_5/doRefresh.sh SupportingFiles/Clause_5/refresh.sh SupportingFiles/Clause_5/logs/mt_[r]_time.log SupportingFiles/Clause_5/logs/refresh_[s]_timing.log
	SQL scripts for DM functions for stream [s]	SupportingFiles/Clause_5/mtloadsql/* SupportingFiles/Clause_5/mtsqls_[s]/LF*.sql SupportingFiles/Clause_5/mtsqls_[s]/DF*.sql SupportingFiles/Clause_5/mtsqls_[s]/ddl.sql

	Output from executing DM functions	SupportingFiles/Clause_5/output/*.out
	Raw data files for maintenance	SupportingFiles/Clause_5/data/delete_[s].dat SupportingFiles/Clause_5/data/inventory_delete_[s].dat
	MT function and data verification sqls and outputs	SupportingFiles/Clause_5/doVerify_mt.sh SupportingFiles/Clause_5/logs/run_verify_mt_[s].log SupportingFiles/Clause_5/mtsqls_[s]/fetch*.sql SupportingFiles/Clause_5/mtsqls_[s]/verify*.sql SupportingFiles/Clause_5/mtsqls_[s]/count_mt_tables.sql SupportingFiles/Clause_5/output/mt_verify/*.out
Clause 6	Data accessibility test scripts, logs and output files	SupportingFiles/Clause_6/data_access.sh SupportingFiles/Clause_6/data_access_test.log SupportingFiles/Clause_6/data_disk_remove.out SupportingFiles/Clause_6 /data_disk_status_fail.out SupportingFiles/Clause_6 /data_disk_status_good.ou
Clause 7	Performance test scripts and logs	SupportingFiles/Clause_7/doQueryGen.sh SupportingFiles/Clause_7/generate_queries.log SupportingFiles/Clause_7/doPower.sh SupportingFiles/Clause_7/doTT.sh SupportingFiles/Clause_7/doStream.sh SupportingFiles/Clause_7/logs/pt_time.log SupportingFiles/Clause_7/logs/tt_[r]_time.log SupportingFiles/Clause_7/logs/stream_[s]_time.log
	Query text for query [q] in stream [s] by order[o]	SupportingFiles/Clause_7/stream[s]/[s][o].query_[q].sql
	Output of query [q] in stream [s] by order[o]	SupportingFiles/Clause_7/stream_[s]_out/[s][o].query_[q].out
Clause 8	System config	SupportingFiles/Clause_8/system_profiles/ SupportingFiles/Clause_8/collect_system_profiles.sh SupportingFiles/Clause_8/collect_system_profiles.log
	Database config	SupportingFiles/Clause_8/gbase_config SupportingFiles/Clause_8/collect_gbase_config.sh SupportingFiles/Clause_8/collect_gbase_config.log
General	Compile tpcds	SupportingFiles/General/compile_tpcds.sh SupportingFiles/General/v2.13.0rc1
	Run all test	SupportingFiles/General/common.sh SupportingFiles/General/config.sh SupportingFiles/General/hosts

		SupportingFiles/General/masterhost SupportingFiles/General/runall.sh SupportingFiles/General/run.log
	Scripts for get q64 result, sort stream outputs and get QphH result	SupportingFiles/General/get_q64_result.sh SupportingFiles/General/result_report.sh SupportingFiles/General/sort_stream_log.sh