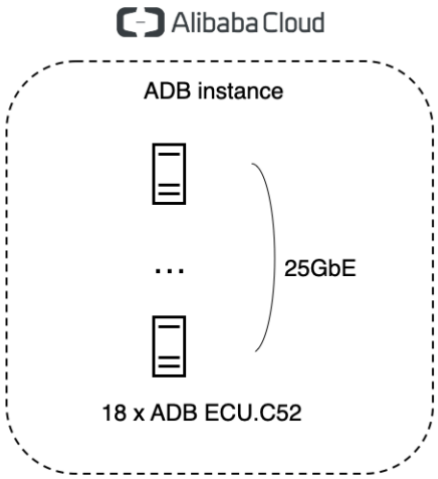
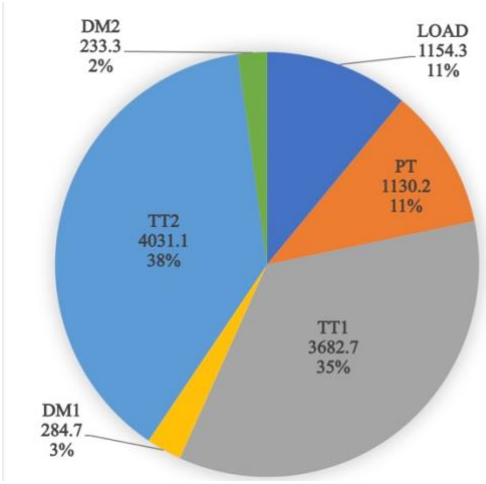
Alibaba Cloud	Alibaba Cloud AnalyticDB		TPC-DS: 2.11.0 TPC-Pricing: 2.5.0 Report Date: May. 02, 2020	
Total System Cost	TPC-DS Throughput	Price/Performance	System Availability Date	
¥1,126,006.68 RMB	**14,895,566** QphDS@10000GB	**¥0.08** RMB/QphDS@10000GB	**As of Publication**	
Dataset Size[1]	Database Manager	Operation System	Other Software	Cluster
10,000 GB	Alibaba Cloud AnalyticDB 3.0.11	Alibaba Group Enterprise Linux Server 7.2 (Paladin)	N/A	Yes



Benchmarked Configuration



Elapsed Time

Load includes backup = No	RAID = No
System Configuration:	**Alibaba Cloud AnalyticDB Cluster**
Servers:	18 x ECU C52
Total Processors/Cores/Threads:	936 virtual cores (threads)
Total Memory:	6,912 GB
Total Storage[2]:	144,000 GB
Storage Ratio[3]:	14.4
Server Configuration:	**Per node (ECU C52)**
Processors/Cores/Threads:	52 virtual cores (threads)
Memory:	384 GB
Network:	25Gbps
Storage Device:	8,000 GB SSD (4 x 2,000 GB NVMe)

1. Dataset Size includes only raw data (i.e., no temp, index, redundant storage space, etc.).
2. Total Storage = 8,000 * 18 (ECU SSD) = 144,000 GB
3. Storage Ratio = Total Storage / SF = 144,000 GB / 10,000 GB

Alibaba Cloud	**Alibaba Cloud AnalyticDB**	TPC-DS: 2.11.0 TPC-Pricing: 2.5.0 Report Date: May. 02, 2020

Description	Part Number	Src	Unit Price (RMB)	Qty	Ext. Price (RMB)	3-Year Maint. (RMB)
Licence Compute and Software Services						
AnalyticDB 3.0 Cluster (3-Year Pre-Pay)	(Eest China 2)	1	1,122,709.68	1	1,122,709.68	included
- C52 Node Group (3 ECU nodes per group)			included	6		
- 8,000GB Storage (per ECU node)			included	18		
- Private Network			included	1		
Licence Computer and Software Services Sub-Total					**1,122,709.68**	**0.00**
Other Components						
Lenovo MIIX 210 Laptop (Includes spares)		2	1,099.00	3	3,297.00	
Other Components Sub-Total					**3,297.00**	**0.00**

1 = Alibaba Cloud, 2 = Tmall.com	**3-Year Cost of Ownership**	**1,126,006.68**
	QphDS@10000GB	**14,895,566**
Audited by Francois Raab, InfoSizing	**RMB/QphDS@10000GB**	**0.08**

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.

Alibaba Cloud	Alibaba Cloud AnalyticDB	TPC-DS: 2.11.0 TPC-Pricing: 2.5.0 Report Date: May. 02, 2020

Metrics Details:

Name	Value	Unit
Scale Factor (SF)	10,000	GB
Streams	4	Stream
Queries (Q)	396	Queries
T_load	1,154.3	Second
T_ld	0.0129	Hour
T_power	1,130.2	Second
T_pt	1.2558	Hour
T_tt1	3,682.7	Second
T_tt2	4,031.1	Second
T_dm1	284.7	Second
T_dm2	233.3	Second
T_tt	2.1428	Hour
T_dm	0.1439	Hour

Load Step	Start	End	(sec.)	(hh:mm:ss)
Build	04/28/20 16:03:24.75	04/28/20 16:22:39.03	1,154.28	0:19:14
Audit	04/28/20 16:22:39.03	04/28/20 17:23:45.80	3,666.77	1:01:07
Finish	04/28/20 17:23:45.80	04/28/20 17:23:45.80	0.00	0:00:00
Reported	**04/28/20 16:03:24.75**	**04/28/20 17:23:45.80**	**1,154.28**	**0:19:14**

Test	Start	End	(sec.)	(hh:mm:ss)
Power	04/28/20 17:35:31.31	04/28/20 17:54:21.51	1,130.20	0:18:50
Thruput-1	04/28/20 17:54:21.52	04/28/20 18:55:44.21	3,682.69	1:01:23
DM-1	04/28/20 18:55:44.22	04/28/20 19:00:28.91	284.69	0:04:45
Thruput-2	04/28/20 19:00:28.92	04/28/20 20:07:40.01	4,031.09	1:07:11
DM-2	04/28/20 20:07:40.01	04/28/20 20:11:33.24	233.23	0:03:53

Stream	Start	End	(sec.)	(hh:mm:ss)
Pt - 0	04/28/20 17:35:31.31	04/28/20 17:54:21.51	1,130.20	0:18:50
Tt1 - 1	04/28/20 17:54:21.52	04/28/20 18:55:44.21	3,682.69	1:01:23
Tt1 - 2	04/28/20 17:54:21.52	04/28/20 18:55:35.59	3,674.07	1:01:14
Tt1 - 3	04/28/20 17:54:21.52	04/28/20 18:54:31.77	3,610.25	1:00:10
Tt1 - 4	04/28/20 17:54:21.52	04/28/20 18:51:59.16	3,457.64	0:57:38
Tt2 - 5	04/28/20 19:00:28.92	04/28/20 20:07:40.01	4,031.09	1:07:11
Tt2 - 6	04/28/20 19:00:28.92	04/28/20 20:06:43.79	3,974.87	1:06:15
Tt2 - 7	04/28/20 19:00:28.92	04/28/20 20:07:20.53	4,011.61	1:06:52
Tt2 - 8	04/28/20 19:00:28.92	04/28/20 20:07:16.88	4,007.96	1:06:48
DMt1 - 1	04/28/20 18:55:44.22	04/28/20 18:58:26.91	162.69	0:02:43
DMt1 - 2	04/28/20 18:58:26.90	04/28/20 19:00:28.91	122.01	0:02:02
DMt2 - 3	04/28/20 20:07:40.01	04/28/20 20:09:34.98	114.97	0:01:55
DMt2 - 4	04/28/20 20:09:34.98	04/28/20 20:11:33.24	118.26	0:01:58

Timing Intervals for Queries (in Seconds)

Query	Stream 0	Stream 1	Stream 2	Stream 3	Stream 4	Min	25%tile	Median	75%tile	Max	Stream 5	Stream 6	Stream 7	Stream 8	Min	25%tile	Median	75%tile	Max
1	1.6	6.9	8.3	16.7	7.9	6.9	7.7	8.1	10.4	16.7	101.6	4.7	63.7	3.4	3.4	4.4	34.2	73.2	101.6
2	7.0	20.6	14.8	12.5	41.1	12.5	14.2	17.7	25.7	41.1	21.4	28.8	17.2	14.0	14.0	16.4	19.3	23.3	28.8
3	5.6	33.4	23.2	21.4	13.2	13.2	19.4	22.3	25.8	33.4	36.9	23.8	34.4	25.0	23.8	24.7	29.7	35.0	36.9
4	30.9	47.0	61.7	43.5	72.6	43.5	46.1	54.4	64.4	72.6	99.2	44.9	49.3	66.9	44.9	48.2	58.1	75.0	99.2
5	9.1	24.7	34.1	30.0	21.3	21.3	23.9	27.4	31.0	34.1	44.9	40.2	47.6	31.9	31.9	38.1	42.6	45.6	47.6
6	1.1	69.1	2.4	7.7	1.9	1.9	2.3	5.1	23.1	69.1	2.2	4.7	2.3	2.4	2.2	2.3	2.4	3.0	4.7
7	6.1	12.1	7.2	9.9	30.1	7.2	9.2	11.0	16.6	30.1	14.4	18.8	10.9	14.4	10.9	13.5	14.4	15.5	18.8
8	1.9	12.0	27.6	17.4	8.2	8.2	11.1	14.7	20.0	27.6	7.5	1.8	15.6	79.6	1.8	6.1	11.6	31.6	79.6
9	16.6	19.2	39.0	20.6	51.1	19.2	20.3	29.8	42.0	51.1	33.8	29.7	29.8	38.6	29.7	29.8	31.8	35.0	38.6
10	1.8	4.5	21.5	10.8	4.4	4.4	4.5	7.7	13.5	21.5	10.8	15.0	11.3	7.4	7.4	10.0	11.1	12.2	15.0
11	20.8	41.1	46.4	37.5	30.9	30.9	35.9	39.3	42.4	46.4	60.9	44.3	56.4	146.8	44.3	53.4	58.7	82.4	146.8
12	0.9	4.6	1.9	2.3	2.6	1.9	2.2	2.5	3.1	4.6	3.3	2.4	6.6	0.8	0.8	2.0	2.9	4.1	6.6
13	18.2	38.9	49.0	86.9	27.7	27.7	36.1	44.0	58.5	86.9	79.7	86.8	39.9	76.3	39.9	67.2	78.0	81.5	86.8
14	26.2	39.7	81.2	64.9	88.6	39.7	58.6	73.1	83.1	88.6	172.9	77.3	68.7	88.1	68.7	75.2	82.7	109.3	172.9
15	1.7	19.9	27.6	6.6	5.2	5.2	6.3	13.3	21.8	27.6	5.4	11.6	10.7	3.4	3.4	4.9	8.1	10.9	11.6
16	13.4	36.8	36.8	74.1	45.4	36.8	36.8	41.1	52.6	74.1	42.6	31.2	45.5	55.6	31.2	39.8	44.1	48.0	55.6
17	3.0	98.9	13.9	20.8	104.2	13.9	19.1	59.9	100.2	104.2	17.6	13.7	16.6	18.2	13.7	15.9	17.1	17.8	18.2
18	3.7	15.5	26.6	9.4	25.6	9.4	14.0	20.6	25.9	26.6	6.2	23.8	35.6	15.7	6.2	13.3	19.8	26.8	35.6
19	1.5	8.1	15.0	34.6	17.4	8.1	13.3	16.2	21.7	34.6	8.1	2.4	5.9	63.9	2.4	5.0	7.0	22.1	63.9
20	0.8	33.5	4.4	5.2	2.4	2.4	3.9	4.8	12.3	33.5	5.9	4.8	4.9	2.6	2.6	4.3	4.9	5.2	5.9
21	0.4	0.5	11.6	2.2	7.6	0.5	1.8	4.9	8.6	11.6	19.7	91.2	2.3	73.5	2.3	15.4	46.6	77.9	91.2
22	1.2	15.9	7.2	3.1	1.4	1.4	2.7	5.2	9.4	15.9	12.0	89.2	10.0	116.7	10.0	11.5	50.6	96.1	116.7
23	195.0	316.1	381.0	246.0	314.3	246.0	297.2	315.2	332.3	381.0	297.7	408.7	329.5	348.3	297.7	321.6	338.9	363.4	408.7
24	49.0	214.5	118.3	148.9	135.1	118.3	130.9	142.0	165.3	214.5	166.4	151.3	180.0	216.8	151.3	162.6	173.2	189.2	216.8
25	2.1	8.3	10.7	6.1	2.9	2.9	5.3	7.2	8.9	10.7	2.3	6.6	7.3	4.7	2.3	4.1	5.7	6.8	7.3
26	2.0	7.6	6.4	5.7	5.5	5.5	5.7	6.1	6.7	7.6	5.7	4.3	13.1	5.1	4.3	4.9	5.4	7.6	13.1
27	2.3	21.1	18.6	10.1	21.2	10.1	16.5	19.9	21.1	21.2	24.8	15.5	7.3	19.2	7.3	13.5	17.4	20.6	24.8
28	18.2	38.6	42.4	27.7	33.1	27.7	31.8	35.9	39.6	42.4	30.8	32.6	36.1	30.7	30.7	30.8	31.7	33.5	36.1
29	4.0	22.3	23.4	23.6	12.4	12.4	19.8	22.9	23.5	23.6	5.6	21.1	17.1	10.7	5.6	9.4	13.9	18.1	21.1
30	2.0	4.0	5.7	9.6	4.8	4.0	4.6	5.3	6.7	9.6	2.9	5.0	6.0	32.9	2.9	4.5	5.5	12.7	32.9
31	15.7	119.6	42.5	33.4	36.7	33.4	35.9	39.6	61.8	119.6	71.4	60.2	87.5	42.6	42.6	55.8	65.8	75.4	87.5
32	1.2	5.1	6.6	3.4	3.2	3.2	3.4	4.3	5.5	6.6	5.5	6.3	52.3	7.7	5.5	6.1	7.0	18.9	52.3
33	1.9	7.3	6.1	8.1	14.0	6.1	7.0	7.7	9.6	14.0	122.8	3.5	6.1	13.3	3.5	5.5	9.7	40.7	122.8
34	10.9	70.1	29.8	38.0	33.6	29.8	32.7	35.8	46.0	70.1	22.6	44.0	42.9	17.7	17.7	21.4	32.8	43.2	44.0
35	5.7	19.4	17.9	42.9	24.1	17.9	19.0	21.8	28.8	42.9	24.6	29.9	40.8	15.3	15.3	22.3	27.3	32.6	40.8
36	4.8	32.4	8.2	20.0	15.4	8.2	13.6	17.7	23.1	32.4	6.8	21.4	28.1	33.2	6.8	17.8	24.8	29.4	33.2
37	4.4	11.7	15.6	9.9	9.2	9.2	9.7	10.8	12.7	15.6	6.3	7.8	16.6	31.7	6.3	7.4	12.2	20.4	31.7
38	16.0	43.4	64.2	41.1	64.2	41.1	42.8	53.8	64.2	64.2	49.9	33.7	76.1	54.9	33.7	45.9	52.4	60.2	76.1
39	1.1	1.0	1.7	1.7	7.0	1.0	1.5	1.7	3.0	7.0	1.3	37.7	3.1	1.8	1.3	1.7	2.5	11.8	37.7
40	2.0	5.2	4.5	8.4	19.4	4.5	5.0	6.8	11.2	19.4	27.5	17.4	20.2	8.3	8.3	15.1	18.8	22.0	27.5
41	0.5	2.0	6.2	18.1	1.4	1.4	1.9	4.1	9.2	18.1	2.8	2.1	7.6	2.9	2.1	2.6	2.9	4.1	7.6
42	0.5	0.5	2.3	3.1	1.9	0.5	1.6	2.1	2.5	3.1	1.8	1.9	1.3	3.3	1.3	1.7	1.9	2.3	3.3
43	6.0	12.1	12.0	19.1	12.3	12.0	12.1	12.2	14.0	19.1	30.9	30.6	14.7	14.9	14.7	14.9	22.8	30.7	30.9
44	1.9	20.5	39.1	71.8	16.9	16.9	19.6	29.8	47.3	71.8	132.5	24.4	116.0	27.0	24.4	26.4	71.5	120.1	132.5
45	1.8	3.4	5.1	15.9	5.9	3.4	4.7	5.5	8.4	15.9	9.0	6.0	17.6	3.3	3.3	5.3	7.5	11.2	17.6
46	9.3	31.8	109.4	128.7	54.0	31.8	48.5	81.7	114.2	128.7	36.4	84.1	46.8	87.7	36.4	44.2	65.5	85.0	87.7
47	16.3	63.5	135.6	75.5	35.9	35.9	56.6	69.5	90.5	135.6	56.7	61.1	53.5	65.6	53.5	55.9	58.9	62.2	65.6
48	11.9	31.1	30.5	31.1	36.1	30.5	31.0	31.1	32.4	36.1	62.7	50.4	41.7	42.9	41.7	42.6	46.7	53.5	62.7
49	2.6	5.5	17.5	9.0	9.0	5.5	8.1	9.0	11.1	17.5	10.1	8.9	8.9	15.6	8.9	8.9	9.5	11.5	15.6
50	12.7	61.8	50.2	41.9	56.1	41.9	48.1	53.2	57.5	61.8	68.3	28.4	49.4	47.5	28.4	42.7	48.5	54.1	68.3
51	13.8	65.5	35.7	54.5	53.6	35.7	49.1	54.1	57.3	65.5	44.1	46.1	51.0	32.0	32.0	41.1	45.1	47.3	51.0
52	0.4	1.0	17.6	1.0	14.7	1.0	1.0	7.9	15.4	17.6	27.4	15.8	1.4	1.3	1.3	1.4	8.6	18.7	27.4
53	0.9	7.2	20.3	4.1	90.0	4.1	6.4	13.8	37.7	90.0	6.2	20.3	8.1	6.7	6.2	6.6	7.4	11.2	20.3
54	1.8	25.3	28.8	10.4	11.1	10.4	10.9	18.2	26.2	28.8	9.5	7.3	5.7	24.9	5.7	6.9	8.4	13.4	24.9
55	0.5	2.5	3.4	13.1	1.3	1.3	2.2	3.0	5.8	13.1	1.9	1.6	10.6	2.7	1.6	1.8	2.3	4.7	10.6
56	1.2	1.6	4.9	4.0	2.7	1.6	2.4	3.4	4.2	4.9	2.7	16.2	2.4	5.1	2.4	2.6	3.9	7.9	16.2
57	15.9	47.7	26.8	39.7	39.7	26.8	36.5	39.7	41.7	47.7	50.8	38.2	31.5	24.7	24.7	29.8	34.9	41.4	50.8
58	1.0	4.9	1.3	4.2	68.9	1.3	3.5	4.6	20.9	68.9	6.4	4.6	2.6	2.9	2.6	2.8	3.8	5.1	6.4
59	11.9	26.4	29.6	27.7	97.0	26.4	27.4	28.7	46.5	97.0	27.9	48.3	39.0	42.1	27.9	36.2	40.6	43.7	48.3
60	1.7	3.1	5.1	27.6	2.8	2.8	3.0	4.1	10.7	27.6	5.1	2.3	8.0	3.3	2.3	3.1	4.2	5.8	8.0
61	2.4	16.5	63.1	5.4	4.0	4.0	5.1	11.0	28.2	63.1	5.8	2.9	8.6	7.0	2.9	5.1	6.4	7.4	8.6
62	4.4	21.4	30.3	30.2	13.3	13.3	19.4	25.8	30.2	30.3	31.9	16.5	35.9	26.3	16.5	23.9	29.1	32.9	35.9
63	1.3	11.0	12.6	11.2	105.0	11.0	11.2	11.9	35.7	105.0	14.3	73.1	45.0	6.5	6.5	12.4	29.7	52.0	73.1
64	53.8	304.5	67.9	130.4	150.9	67.9	114.8	140.7	189.3	304.5	140.5	191.2	131.6	135.1	131.6	134.2	137.8	153.2	191.2
65	8.3	22.2	19.5	53.8	31.3	19.5	21.5	26.8	36.9	53.8	34.8	20.6	32.0	15.5	15.5	19.3	26.3	32.7	34.8
66	5.8	20.7	24.8	14.8	13.0	13.0	14.4	17.8	21.7	24.8	27.7	20.0	110.0	34.9	20.0	25.8	31.3	53.7	110.0
67	26.0	149.8	119.0	118.2	100.7	100.7	113.8	118.6	126.7	149.8	77.3	114.2	219.7	133.0	77.3	105.0	123.6	154.7	219.7
68	7.8	36.6	46.0	27.8	21.7	21.7	26.3	32.2	39.0	46.0	50.9	59.9	39.4	22.3	22.3	35.1	45.2	53.2	59.9
69	2.2	24.6	9.8	7.4	5.9	5.9	7.0	8.6	13.5	24.6	19.6	4.3	10.2	8.8	4.3	7.7	9.5	12.6	19.6
70	11.5	41.2	33.7	59.3	37.7	33.7	36.7	39.5	45.7	59.3	39.2	47.5	29.2	48.5	29.2	36.7	43.4	47.8	48.5
71	4.7	4.6	3.6	3.6	8.2	3.6	3.6	4.1	5.5	8.2	19.9	8.4	4.1	10.3	4.1	7.3	9.4	12.7	19.9
72	20.4	59.0	62.2	41.4	53.2	41.4	50.3	56.1	59.8	62.2	123.4	110.8	69.4	75.2	69.4	73.8	93.0	114.0	123.4
73	2.6	41.3	32.4	15.9	12.9	12.9	15.2	24.2	34.6	41.3	38.1	22.1	10.7	20.9	10.7	18.4	21.5	26.1	38.1
74	42.0	64.4	97.8	122.5	106.8	64.4	89.5	102.3	110.7	122.5	97.7	109.3	149.9	116.4	97.7	106.4	112.9	124.8	149.9
75	65.6	80.3	59.8	84.5	39.9	39.9	54.8	70.1	81.4	84.5	54.4	55.4	41.7	86.1	41.7	51.2	54.9	63.1	86.1
76	12.2	36.9	46.5	148.1	32.7	32.7	35.9	41.7	71.9	148.1	19.9	40.4	22.7	37.2	19.9	22.0	30.0	38.0	40.4
77	2.1	6.2	2.2	13.2	3.2	2.2	3.0	4.7	8.0	13.2	27.9	6.7	66.5	3.4	3.4	5.9	17.3	37.6	66.5
78	49.9	127.9	124.9	119.5	152.1	119.5	123.6	126.4	134.0	152.1	144.9	150.3	124.9	119.3	119.3	123.5	134.9	146.3	150.3
79	11.5	16.3	53.6	123.1	24.4	16.3	22.4	39.0	71.0	123.1	26.1	126.5	62.6	112.2	26.1	53.5	87.4	115.8	126.5
80	7.3	16.2	25.1	10.1	11.4	10.1	11.1	13.8	18.4	25.1	39.1	16.5	24.8	21.4	16.5	20.2	23.1	28.4	39.1
81	1.5	8.6	7.0	29.7	28.1	7.0	8.2	18.4	28.5	29.7	27.7	4.2	9.7	20.0	4.2	8.3	14.9	21.9	27.7
82	8.0	43.9	54.5	41.8	40.0	40.0	41.4	42.9	46.6	54.5	9.8	56.3	43.4	81.4	9.8	35.0	49.9	62.6	81.4
83	1.0	1.0	7.7	3.7	11.8	1.0	3.0	5.7	8.7	11.8	71.1	77.3	1.4	2.9	1.4	2.5	37.0	72.7	77.3
84	1.6	4.0	11.7	32.4	11.4	4.0	9.6	11.6	16.9	32.4	16.7	10.9	11.6	11.9	10.9	11.4	11.8	13.1	16.7
85	14.7	63.4	72.4	32.1	25.0	25.0	30.3	47.8	65.7	72.4	49.1	47.7	147.0	58.0	47.7	48.8	53.6	80.3	147.0
86	3.7	10.1	14.9	3.3	3.8	3.3	3.7	7.0	11.3	14.9	8.8	8.0	9.0	9.9	8.0	8.6	8.9	9.2	9.9
87	15.9	59.5	116.7	47.8	49.8	47.8	49.3	54.7	73.8	116.7	44.7	49.3	97.0	56.7	44.7	48.2	53.0	66.8	97.0
88	32.5	57.6	47.5	132.5	52.3	47.5	51.1	55.0	76.3	132.5	63.5	98.6	65.2	91.7	63.5	64.8	78.5	93.4	98.6
89	6.4	35.4	42.2	9.5	10.5	9.5	10.3	23.0	37.1	42.2	24.1	11.2	29.8	19.9	11.2	17.7	22.0	25.5	29.8
90	5.0	7.0	87.8	12.4	11.4	7.0	10.3	11.9	31.3	87.8	26.0	9.4	10.9	12.9	9.4	10.5	11.9	16.2	26.0
91	1.2	3.1	9.5	8.1	4.5	3.1	4.2	6.3	8.5	9.5	2.6	1.6	1.5	26.6	1.5	1.6	2.1	8.6	26.6
92	0.8	7.0	4.0	4.4	14.4	4.0	4.3	5.7	8.9	14.4	4.7	4.3	1.0	4.6	1.0	3.5	4.5	4.6	4.7
93	15.6	48.5	56.4	45.1	46.3	45.1	46.0	47.4	50.5	56.4	96.5	75.3	51.4	65.3	51.4	61.8	70.3	80.6	96.5
94	3.2	12.4	26.4	13.9	7.4	7.4	11.2	13.2	17.0	26.4	104.9	20.1	25.3	14.4	14.4	18.7	22.7	45.2	104.9
95	8.5	38.8	121.7	21.4	108.3	21.4	34.5	73.6	111.7	121.7	33.3	42.4	34.1	50.7	33.3	33.9	38.3	44.5	50.7
96	7.9	45.9	19.4	62.1	8.3	8.3	16.6	32.7	50.0	62.1	26.2	45.9	24.0	45.0	24.0	25.7	35.6	45.2	45.9
97	27.6	50.8	59.7	61.3	80.1	50.8	57.5	60.5	66.0	80.1	69.1	58.9	87.5	61.5	58.9	60.9	65.3	73.7	87.5
98	1.6	4.5	5.0	6.2	3.3	3.3	4.2	4.8	5.3	6.2	7.6	8.2	2.8	2.3	2.3	2.7	5.2	7.8	8.2
99	12.0	115.9	33.2	83.0	38.9	33.2	37.5	61.0	91.2	115.9	40.4	56.2	51.6	40.1	40.1	40.3	46.0	52.8	56.2

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	64.4	39.3	31.1	36.6	31.1	35.2	38.0	45.6	64.4
DF_I	13.9	13.0	5.1	4.3	4.3	4.9	9.0	13.2	13.9
DF_SS	73.0	62.7	46.0	58.2	46.0	55.1	60.5	65.3	73.0
DF_WS	55.6	29.9	19.3	26.9	19.3	25.0	28.4	36.3	55.6
LF_CR	30.2	17.5	18.3	17.1	17.1	17.4	17.9	21.3	30.2
LF_CS	55.8	37.4	45.5	41.9	37.4	40.8	43.7	48.1	55.8
LF_I	29.7	16.6	15.0	15.3	15.0	15.2	15.9	19.9	29.7
LF_SR	30.1	17.6	18.5	17.3	17.3	17.5	18.1	21.4	30.1
LF_SS	59.6	41.7	50.5	42.8	41.7	42.5	46.6	52.7	59.6
LF_WR	29.7	12.4	13.6	13.7	12.4	13.3	13.6	17.7	29.7
LF_WS	36.0	20.3	31.2	22.0	20.3	21.5	26.6	32.4	36.0