

	Databricks SQL 8.3		TPC-DS: 3.2.0 TPC-Pricing: 2.7.0 Report Date: 2021-11-02																						
Total System Cost	TPC-DS Throughput	Price/Performance	System Availability Date																						
\$5,190,345 USD	32,941,245 QphDS@100000GB	\$157.57 USD/kQphDS@100000GB	As of Publication																						
Dataset Size	Database Manager	Operating System	Other Software	Cluster																					
100,000 GB	Databricks Delta Engine 8.3	Linux	N/A	Yes																					
<p>Benchmarked Configuration</p>		<p>Elapsed Time</p> <table border="1"> <thead> <tr> <th>Metric</th> <th>Value</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>T_load</td> <td>7,929.4</td> <td>23%</td> </tr> <tr> <td>T_tt2</td> <td>9,844.3</td> <td>28%</td> </tr> <tr> <td>T_tt1</td> <td>9,487.6</td> <td>27%</td> </tr> <tr> <td>T_power</td> <td>3,527.8</td> <td>10%</td> </tr> <tr> <td>T_dm2</td> <td>2,065.0</td> <td>6%</td> </tr> <tr> <td>T_dm1</td> <td>1,984.3</td> <td>6%</td> </tr> </tbody> </table>			Metric	Value	Percentage	T_load	7,929.4	23%	T_tt2	9,844.3	28%	T_tt1	9,487.6	27%	T_power	3,527.8	10%	T_dm2	2,065.0	6%	T_dm1	1,984.3	6%
Metric	Value	Percentage																							
T_load	7,929.4	23%																							
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T_power	3,527.8	10%																							
T_dm2	2,065.0	6%																							
T_dm1	1,984.3	6%																							
Load includes backup = No		RAID = No																							
System Configuration:		Databricks DBSQL 4X-Large																							
Servers:		1 x i3.16xlarge + 256 x i3.2xlarge																							
Total Processors/Cores/Threads:		2,112 vCPU																							
Total Memory:		16,104 (GiB)																							
Total Storage:		501.6 TB (Nodes) + 26.6 TB (Amazon S3)																							
Storage Ratio:		5.40																							
Server Configuration:		Per Worker Node (256)	Per Driver Node (1)																						
Processors/Cores/Threads:		8 vCPU	64 vCPU																						
Memory:		61 GiB	488 GiB																						
Network:		Up to 10 Gigabit	Up to 10 Gigabit																						
Storage Device:		1 x 1.9 TB NVMe SSD	8 x 1.9 TB NVMe SSD																						
Amazon S3 Standard Storage:		26.6 TB (Total usage)																							



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TPC-DS: 3.2.0
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 Report Date: 2021-11-02

Description	Part Number	Source	Unit Price	Qty	Extended Price	3 Yr. Maintenance												
Server Hardware																		
i3.2xlarge	i3.2xlarge	2	\$6,937.92	256	\$1,776,107.52													
i3.16xlarge	i3.16xlarge	2	\$55,503.36	1	\$55,503.36													
Hardware Subtotal					\$1,831,610.88	0												
Server Software																		
DBU for 4X-Large (528 DBUs, \$0.22/DBU)	DBU for 4X-Large	1	\$1,017,561.60	3	\$3,052,684.80													
Software Subtotal					\$3,052,684.80	0												
External Server Storage																		
Amazon S3 standard storage	S3 Standard storage GB/month	2	\$0.023	980,582	\$22,553.40													
PUT, COPY, POST, LIST requests to S3 Standard	PUT requests	2	\$1,401.521	36	\$50,454.77													
GET requests to S3 Standard	GET requests	2	\$3,111.186	36	\$112,002.71													
Storage Subtotal					\$185,010.88	0												
Server Subtotal					\$5,069,306.56	0												
Client Hardware																		
i3en.6xlarge	i3en.6xlarge	2	\$26,990	1	\$26,990													
Hardware Subtotal					\$26,990	0												
Client Software																		
Standard All Purpose compute (\$0.40/DBU)	i3en.6xlarge 24 CPUs 192 GB 8.7 DBU/hr \$3.480/hr	1	\$31,069.44	3	\$93,208.32													
Client Subtotal					\$120,198	0												
Network/Infrastructure																		
Lenovo Chromebook S330 Laptop (Included spare)	B07GLV1VC7	3	\$279.99	3	\$839.97													
Network/Infrastructure Subtotal					\$839.97	0												
Source: 1 = Databricks, 2 = Amazon Web Services, 3 = Amazon.com <div style="text-align: center;">Audited by Francois Raab, InfoSizing</div>					<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Totals</td> <td style="text-align: right;">\$5,190,344.40</td> <td style="text-align: right;">0</td> </tr> <tr> <td>3-Year Cost of Ownership</td> <td></td> <td style="text-align: right;">5,190,345</td> </tr> <tr> <td>QphDS@100000GB</td> <td></td> <td style="text-align: right;">32,941,245</td> </tr> <tr> <td>\$/kQphDS@100000GB</td> <td></td> <td style="text-align: right;">157.57</td> </tr> </table>		Totals	\$5,190,344.40	0	3-Year Cost of Ownership		5,190,345	QphDS@100000GB		32,941,245	\$/kQphDS@100000GB		157.57
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Databricks SQL 8.3

TPC-DS: 3.2.0
TPC-Pricing: 2.7.0
Report Date:2021-11-02

Metrics Details:

Name	Value	Unit
Scale Factor (SF)	100,000	GB
Streams	4	Stream
Queries (Q)	396	Queries
T_load	7,929.40	Second
T_ld	0.0882	Hour
T_power	3,527.80	Second
T_pt	3.9198	Hour
T_tt1	9,487.60	Second
T_tt2	9,844.30	Second
T_dm1	1,984.30	Second
T_dm2	2,065.00	Second
T_tt	5.37	Hour
T_dm	1.1249	Hour

Load Step	Start	End	(sec.)	(hh:mm:ss)
Build	08/18/21 19:44:21	08/18/21 21:56:31	7,929.35	2:12:09
Audit	08/18/21 21:56:31	08/18/21 22:13:41	1,030.10	0:17:10
Finish	08/18/21 22:13:41	08/18/21 22:13:41	0.02	0:00:00
Reported	08/18/21 19:44:21	08/18/21 22:13:41	7,929.37	2:12:09

Test	Start	End	(sec.)	(hh:mm:ss)
Power	08/19/21 0:21:18	08/19/21 1:20:05	3,527.77	0:58:48
Thruput-1	08/19/21 1:20:07	08/19/21 3:58:15	9,487.53	2:38:08
DM-1	08/19/21 3:58:17	08/19/21 4:31:22	1,984.24	0:33:04
Thruput-2	08/19/21 4:31:23	08/19/21 7:15:28	9,844.25	2:44:04
DM-2	08/19/21 7:15:40	08/19/21 7:50:05	2,065.00	0:34:25

Stream	Start	End	(sec.)	(hh:mm:ss)
Pt - 0	08/19/21 0:21:18	08/19/21 1:20:05	3,527.77	0:58:48
Tt1 - 1	08/19/21 1:20:07	08/19/21 3:57:05	9,417.35	2:36:57
Tt1 - 2	08/19/21 1:20:07	08/19/21 3:55:11	9,303.69	2:35:04
Tt1 - 3	08/19/21 1:20:07	08/19/21 3:58:15	9,487.53	2:38:08
Tt1 - 4	08/19/21 1:20:07	08/19/21 3:56:55	9,407.67	2:36:48
Tt2 - 5	08/19/21 4:31:23	08/19/21 7:15:26	9,842.48	2:44:02
Tt2 - 6	08/19/21 4:31:23	08/19/21 7:15:16	9,833.11	2:43:53
Tt2 - 7	08/19/21 4:31:23	08/19/21 7:15:11	9,827.77	2:43:48
Tt2 - 8	08/19/21 4:31:23	08/19/21 7:15:28	9,844.25	2:44:04
DMt1 - 1	08/19/21 3:58:17	08/19/21 4:14:53	995.37	0:16:35
DMt1 - 2	08/19/21 4:14:53	08/19/21 4:31:22	988.88	0:16:29
DMt2 - 3	08/19/21 7:15:40	08/19/21 7:32:29	1,009.85	0:16:50
DMt2 - 4	08/19/21 7:32:29	08/19/21 7:50:05	1,055.16	0:17:35



Databricks SQL 8.3

TPC-DS: 3.2.0
TPC-Pricing: 2.7.0
Report Date: 2021-11-02

Timing Intervals for Each Query (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	17.9	56.7	44.1	53.5	53.1	44.1	50.9	53.3	54.3	56.7	56.6	51.7	41	59.6	41	49	54.2	57.4	59.6
2	24.1	58.6	49.2	70.9	56.2	49.2	54.5	57.4	61.7	70.9	61.2	57.6	51.6	52.7	51.6	52.4	55.2	58.5	61.2
3	6.9	14.3	15.4	13.7	27.5	13.7	14.2	14.9	18.4	27.5	15.7	15.6	25.3	16.7	15.6	15.7	16.2	18.9	25.3
4	132.5	401.8	426.4	410.1	467	401.8	408	418.3	436.6	467	412.2	401.9	410.2	394.4	394.4	400	406.1	410.7	412.2
5	40	127.6	117.3	58	80.2	58	74.7	98.8	119.9	127.6	94.1	141.8	160	109.4	94.1	105.6	125.6	146.4	160
6	5.8	18.3	29.8	22.9	11.5	11.5	16.6	20.6	24.6	29.8	16.2	31.2	14.8	14.5	14.5	14.7	15.5	20	31.2
7	21.3	52.7	51.6	33.4	55.7	33.4	47.1	52.2	53.5	55.7	33.6	44.6	48.3	25	25	31.5	39.1	45.5	48.3
8	6.4	17.3	17.3	20.8	21	17.3	17.3	19.1	20.9	21	17.1	15.1	16.6	17.8	15.1	16.2	16.9	17.3	17.8
9	40.7	150.5	104.2	142.9	101.1	101.1	103.4	123.6	144.8	150.5	160.2	156.6	129	130.5	129	130.1	143.6	157.5	160.2
10	12.1	33.6	30.7	20.6	33.6	20.6	28.2	32.2	33.6	33.6	19.6	19.9	41.6	28.2	19.6	19.8	24.1	31.6	41.6
11	72.8	173.5	236.5	239.5	185.5	173.5	182.5	211	237.3	239.5	172.5	162.8	244	204	162.8	170.1	188.3	214	244
12	5.7	15.2	16.4	19.7	13.5	13.5	14.8	15.8	17.2	19.7	12.1	14.5	11.5	12.4	11.5	12	12.3	12.9	14.5
13	19	48.2	52.3	42	18.5	18.5	36.1	45.1	49.2	52.3	41.8	48.5	41	32.2	32.2	38.8	41.4	43.5	48.5
14	142	395.5	406.9	392.3	413.7	392.3	394.7	401.2	408.6	413.7	404	426.4	446.6	395.8	395.8	402	415.2	431.5	446.6
15	7.4	17	18.3	15.1	31.3	15.1	16.5	17.7	21.6	31.3	17.8	13.8	22.4	21	13.8	16.8	19.4	21.4	22.4
16	50.7	48.5	149.8	149.6	126.4	48.5	106.9	138	149.7	149.8	109.8	147.1	167.5	146.5	109.8	137.3	146.8	152.2	167.5
17	29.1	72.5	58.9	58.1	64.3	58.1	58.7	61.6	66.4	72.5	100.3	84.2	63.8	55.7	55.7	61.8	74	88.2	100.3
18	26	62.9	51.3	51.2	38.7	38.7	48.1	51.3	54.2	62.9	40.8	52	42.9	44.1	40.8	42.4	43.5	46.1	52
19	11	34.9	21.4	17.3	13.1	13.1	16.3	19.4	24.8	34.9	18.8	16.3	23.7	16.9	16.3	16.8	17.9	20	23.7
20	6.1	17.9	11.7	20.4	26	11.7	16.4	19.2	21.8	26	21.5	25.6	16.9	24.7	16.9	20.4	23.1	24.9	25.6
21	2.6	7.7	4.5	8.3	8.2	4.5	6.9	8	8.2	8.3	6.8	4.6	6.5	5.6	4.6	5.4	6.1	6.6	6.8
22	3.4	10.7	11.8	22.7	10.5	10.5	10.7	11.3	14.5	22.7	8.6	7.4	7.7	7.8	7.4	7.6	7.8	8	8.6
23	182.3	512	547.7	567.5	543.9	512	535.9	545.8	552.7	567.5	633.5	668.9	597.5	727.5	597.5	624.5	651.2	683.6	727.5
24	228.2	704.1	647.2	749	712.7	647.2	689.9	708.4	721.8	749	818.4	842.6	807	856.2	807	815.6	830.5	846	856.2
25	24.6	59	61.4	66.3	67	59	60.8	63.9	66.5	67	45.2	52.4	65.3	84.3	45.2	50.6	58.9	70.1	84.3
26	13.9	34	36.2	24.4	30.7	24.4	29.1	32.4	34.6	36.2	26.1	35.9	23.4	23.5	23.4	23.5	24.8	28.6	35.9
27	19.4	46	55.5	58.8	27.5	27.5	41.4	50.8	56.3	58.8	28	43.7	44.4	39.6	28	36.7	41.7	43.9	44.4
28	111.6	333.1	258.7	386.5	308.4	258.7	296	320.8	346.5	386.5	318	310.5	329.3	354.1	310.5	316.1	323.7	335.5	354.1
29	70.5	102.6	135.9	96.6	96.2	96.2	96.5	99.6	110.9	135.9	105.8	120.7	120.8	108.1	105.8	107.5	114.4	120.7	120.8
30	17.3	14.9	24.5	25.9	28.4	14.9	22.1	25.2	26.5	28.4	19.4	22.3	26.6	14.3	14.3	18.1	20.9	23.4	26.6
31	27.7	101	50.4	53.7	56.3	50.4	52.9	55	67.5	101	40.1	83.6	57.2	70.9	40.1	52.9	64.1	74.1	83.6
32	9.1	11.7	19.5	33.7	32	11.7	17.6	25.8	32.4	33.7	17.6	22.9	15.6	27.3	15.6	17.1	20.3	24	27.3
33	10.7	24.8	26.8	25.8	25.5	24.8	25.3	25.7	26.1	26.8	27.1	20.8	23.5	29.8	20.8	22.8	25.3	27.8	29.8
34	24.5	40.2	36.9	41.4	30.8	30.8	35.4	38.6	40.5	41.4	55.8	36.8	37.8	56.1	36.8	37.6	46.8	55.9	56.1
35	22.5	67.3	24.7	25.5	47.4	24.7	25.3	36.5	52.4	67.3	59.4	40.6	43.2	46	40.6	42.6	44.6	49.4	59.4
36	15.6	48.1	66.1	58.5	41.3	41.3	46.4	53.3	60.4	66.1	51.1	35.7	32.6	44.5	32.6	34.9	40.1	46.2	51.1
37	24.6	66.3	64.6	85.1	88.8	64.6	65.9	75.7	86	88.8	78.1	102.2	72.8	43.6	43.6	65.5	75.5	84.1	102.2
38	45.7	90.4	79	70.7	105.2	70.7	76.9	84.7	94.1	105.2	118.6	90.4	117.3	69.9	69.9	85.3	103.9	117.6	118.6

39	11.1	14.5	20.7	16.3	21.4	14.5	15.9	18.5	20.9	21.4	23.5	17.3	19.8	20.4	17.3	19.2	20.1	21.2	23.5
40	14.7	52.7	54.9	59.5	39.4	39.4	49.4	53.8	56.1	59.5	43.4	30.9	72.9	41.4	30.9	38.8	42.4	50.8	72.9
41	1	2.3	1.9	3.2	2.2	1.9	2.1	2.3	2.5	3.2	2.7	1.5	3	1.7	1.5	1.7	2.2	2.8	3
42	8.1	10.1	11	14.9	16.9	10.1	10.8	13	15.4	16.9	12.9	19.4	9.4	12.5	9.4	11.7	12.7	14.5	19.4
43	8.8	35.1	35.7	32.1	27.4	27.4	30.9	33.6	35.3	35.7	41.4	21.9	29.5	33.8	21.9	27.6	31.7	35.7	41.4
44	33	92.2	90.9	99.8	107.7	90.9	91.9	96	101.8	107.7	60.8	117.4	123.4	121.5	60.8	103.3	119.5	122	123.4
45	8.2	23.4	17.6	17.1	30.9	17.1	17.5	20.5	25.3	30.9	19.8	15.3	11	13.9	11	13.2	14.6	16.4	19.8
46	17.1	35.1	39.9	26.7	30.7	26.7	29.7	32.9	36.3	39.9	28.9	22.9	39.1	24.9	22.9	24.4	26.9	31.5	39.1
47	36.5	132.5	108.4	98.3	125.7	98.3	105.9	117.1	127.4	132.5	104.8	97.4	97.6	80.1	80.1	93.1	97.5	99.4	104.8
48	12.7	41.3	23.6	43.1	32	23.6	29.9	36.7	41.8	43.1	25	38.6	45.8	40.1	25	35.2	39.4	41.5	45.8
49	26.9	25.9	58.1	28	54.9	25.9	27.5	41.5	55.7	58.1	57.8	45.7	62	47.9	45.7	47.4	52.9	58.9	62
50	96.9	360.1	356.9	269.2	385.3	269.2	335	358.5	366.4	385.3	360.5	322.8	255.6	335.6	255.6	306	329.2	341.8	360.5
51	31.8	40.3	89.9	58.5	57.1	40.3	52.9	57.8	66.4	89.9	63.2	71.5	28.5	62.9	28.5	54.3	63.1	65.3	71.5
52	6.4	15.4	12.9	13.6	11.5	11.5	12.6	13.3	14.1	15.4	10.1	18.1	12.9	19.4	10.1	12.2	15.5	18.4	19.4
53	9	35.6	27.1	32.6	21.7	21.7	25.8	29.9	33.4	35.6	28.4	28.6	18.9	49.5	18.9	26	28.5	33.8	49.5
54	16.9	33	41	46.1	35.5	33	34.9	38.3	42.3	46.1	48.9	44.6	23.3	29.2	23.3	27.7	36.9	45.7	48.9
55	4.8	23	15.1	18.7	13.5	13.5	14.7	16.9	19.8	23	14.8	11.9	14.5	12.2	11.9	12.1	13.4	14.6	14.8
56	13.8	17.6	20.2	32.6	38.8	17.6	19.6	26.4	34.2	38.8	23.4	30.9	22.8	18.4	18.4	21.7	23.1	25.3	30.9
57	28.9	63.7	62.5	80.1	79.2	62.5	63.4	71.5	79.4	80.1	53.7	103.6	88.4	48.2	48.2	52.3	71.1	92.2	103.6
58	5	15	25.9	25.3	11.4	11.4	14.1	20.2	25.5	25.9	17.4	15.7	15.8	15.4	15.4	15.6	15.8	16.2	17.4
59	33.7	82.8	113.9	94.7	89.7	82.8	88	92.2	99.5	113.9	99.6	85.6	105.9	106.3	85.6	96.1	102.8	106	106.3
60	16.3	28.7	37.6	36.2	34	28.7	32.7	35.1	36.6	37.6	32.7	40.3	32.1	31.9	31.9	32.1	32.4	34.6	40.3
61	14.6	30.7	31.1	30.5	30.9	30.5	30.7	30.8	31	31.1	35.6	27	22.8	32.3	22.8	26	29.7	33.1	35.6
62	9	22.2	28.6	26.2	29.6	22.2	25.2	27.4	28.9	29.6	36.8	31.9	30.6	29.5	29.5	30.3	31.3	33.1	36.8
63	8.8	20.7	28.4	23.6	20.9	20.7	20.9	22.3	24.8	28.4	19.8	24.7	31.7	16.7	16.7	19	22.3	26.5	31.7
64	245.9	675.2	425.8	646.6	545	425.8	515.2	595.8	653.8	675.2	694.4	707.4	729.8	621.5	621.5	676.2	700.9	713	729.8
65	62	138.5	146.4	116.5	160.6	116.5	133	142.5	150	160.6	88	131.8	158.2	197.4	88	120.9	145	168	197.4
66	14.8	32.4	32.7	52.6	33	32.4	32.6	32.9	37.9	52.6	25.2	51.2	26.4	34.7	25.2	26.1	30.6	38.8	51.2
67	102.8	297.8	388.2	344	369.9	297.8	332.5	357	374.5	388.2	312.1	311.7	289.1	376.3	289.1	306.1	311.9	328.2	376.3
68	8.2	27.4	15.1	21.5	27.6	15.1	19.9	24.5	27.5	27.6	18.1	16	15.7	23.3	15.7	15.9	17.1	19.4	23.3
69	11.6	23.8	8.2	25	24.9	8.2	19.9	24.4	24.9	25	30	10.2	43.8	7.4	7.4	9.5	20.1	33.5	43.8
70	20.8	30.9	56.2	70.3	84.6	30.9	49.9	63.3	73.9	84.6	68	74.8	40.5	58.9	40.5	54.3	63.5	69.7	74.8
71	19.3	40.1	55.8	38.2	37.1	37.1	37.9	39.2	44	55.8	61	45.7	38	58	38	43.8	51.9	58.8	61
72	41.1	90.3	91.3	89	95.6	89	90	90.8	92.4	95.6	102.3	116.8	79.8	144.1	79.8	96.7	109.6	123.6	144.1
73	6.7	24.5	28.7	12.8	13.3	12.8	13.2	18.9	25.6	28.7	14.9	14.1	14.2	16.4	14.1	14.2	14.6	15.3	16.4
74	57.6	109.2	148.6	151.3	123.9	109.2	120.2	136.3	149.3	151.3	120.3	144.9	122.2	138.3	120.3	121.7	130.3	140	144.9
75	139.5	310.3	301.2	277.9	283.8	277.9	282.3	292.5	303.5	310.3	330	247.1	315.5	329	247.1	298.4	322.3	329.3	330
76	31.5	114	111.6	142.9	148.7	111.6	113.4	128.5	144.4	148.7	101.1	129.2	136.1	103.8	101.1	103.1	116.5	130.9	136.1
77	10.6	52.6	32.4	37.4	23.5	23.5	30.2	34.9	41.2	52.6	36.9	29.7	40.6	34.1	29.7	33	35.5	37.8	40.6
78	104.3	250.9	251.5	282.8	262	250.9	251.4	256.8	267.2	282.8	298	333.3	344.9	278.9	278.9	293.2	315.7	336.2	344.9
79	14.5	49.7	33.1	26.7	20.2	20.2	25.1	29.9	37.3	49.7	24.4	36.6	30.9	26.5	24.4	26	28.7	32.3	36.6
80	44.8	132.1	125.3	128	129.1	125.3	127.3	128.6	129.9	132.1	138.2	102.1	125.3	143.6	102.1	119.5	131.8	139.6	143.6
81	12.7	24.9	22.2	39.3	35.7	22.2	24.2	30.3	36.6	39.3	36.4	31	25.5	25.8	25.5	25.7	28.4	32.4	36.4

82	42.9	178	123	137.6	151.7	123	134	144.7	158.3	178	127.8	177.9	112.3	152.8	112.3	123.9	140.3	159.1	177.9
83	14.6	18.8	20.9	31.1	24.8	18.8	20.4	22.9	26.4	31.1	12.9	22.1	20	25.6	12.9	18.2	21.1	23	25.6
84	9	20	31.4	26.5	22.2	20	21.7	24.4	27.7	31.4	22.5	23.6	21.5	23.2	21.5	22.3	22.9	23.3	23.6
85	19.5	30.5	47.3	31.9	62.8	30.5	31.6	39.6	51.2	62.8	35.5	32.2	42.2	46.5	32.2	34.7	38.9	43.3	46.5
86	10.4	42	25.4	33.5	34.5	25.4	31.5	34	36.4	42	35.8	17.9	25.7	30.7	17.9	23.8	28.2	32	35.8
87	45.5	103.8	71.3	125.8	90.5	71.3	85.7	97.2	109.3	125.8	94.5	78.5	76.5	115.1	76.5	78	86.5	99.7	115.1
88	77.2	307.3	330.9	153.5	381.1	153.5	268.9	319.1	343.5	381.1	393.2	332	377.2	277.2	277.2	318.3	354.6	381.2	393.2
89	10.7	39.7	43.2	20.7	24.1	20.7	23.3	31.9	40.6	43.2	24.7	22.6	34.3	20.7	20.7	22.1	23.7	27.1	34.3
90	8.6	31.9	36.5	32.7	43.4	31.9	32.5	34.6	38.2	43.4	29	22.7	36.4	25.5	22.7	24.8	27.3	30.9	36.4
91	4.6	14.9	16.2	14.9	9.6	9.6	13.6	14.9	15.2	16.2	12.9	10.6	19	16.5	10.6	12.3	14.7	17.1	19
92	5.9	23	13	26.8	13.1	13	13.1	18.1	24	26.8	26.4	33.4	19.3	18.9	18.9	19.2	22.9	28.2	33.4
93	124.8	387.6	358.1	404.6	280	280	338.6	372.9	391.9	404.6	440.7	295.3	381.6	383	295.3	360	382.3	397.4	440.7
94	23.9	87.2	84.2	78.9	77.8	77.8	78.6	81.6	85	87.2	74.9	91.2	70.3	47.6	47.6	64.6	72.6	79	91.2
95	58.7	126.5	171.4	152.3	126.3	126.3	126.5	139.4	157.1	171.4	185.7	156.4	139.8	191	139.8	152.3	171.1	187	191
96	21.3	46.6	66.1	48.1	56.5	46.6	47.7	52.3	58.9	66.1	93	51.5	44.3	49.5	44.3	48.2	50.5	61.9	93
97	32.7	117.1	102.1	120	90.8	90.8	99.3	109.6	117.8	120	112.4	116.1	88.1	77.3	77.3	85.4	100.3	113.3	116.1
98	13.4	38.4	20.1	20.6	32.4	20.1	20.5	26.5	33.9	38.4	22.3	22.8	28.4	29.2	22.3	22.7	25.6	28.6	29.2
99	54.6	38.8	58.5	50.4	26.5	26.5	35.7	44.6	52.4	58.5	54.1	42.9	54.8	43.8	42.9	43.6	49	54.3	54.8

Timing Intervals for Each Refresh Function (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	318.9	312.3	328.7	317.4	312.3	316.2	318.2	321.3	328.7
DF_I	16.9	16.8	18.6	17.4	16.8	16.9	17.1	17.7	18.6
DF_SS	735	722.9	724.2	735.1	722.9	723.9	729.6	735	735.1
DF_WS	402.3	493.1	508	511.3	402.3	470.4	500.5	508.8	511.3
LF_CR	36.3	30	34	31.6	30	31.2	32.8	34.6	36.3
LF_CS	54.6	51.4	54.4	58.4	51.4	53.6	54.5	55.5	58.4
LF_I	13.4	14.5	11.2	17.2	11.2	12.9	14	15.2	17.2
LF_SR	33.2	33.3	28.8	81.6	28.8	32.1	33.3	45.4	81.6
LF_SS	52.2	59.4	75.9	57.8	52.2	56.4	58.6	63.5	75.9
LF_WR	26.8	26.7	27.3	26.9	26.7	26.8	26.9	27	27.3
LF_WS	43.8	50.6	54	46.5	43.8	45.8	48.6	51.5	54