



Consolidated Tape Association

Key Operating Metrics of Tape A&B U.S. Equities Securities Information Processor (CTA SIP)

Quote Feed (Tape A&B)														
System Availability (1)	Peak Messages Per Second (thousands)	Capacity Messages Per Second (millions)	Capacity vs Peak Ratio	Peak Messages Per 100 Milliseconds (thousands) (2)	Capacity Messages Per 100 Milliseconds (thousands)	Capacity vs Peak Ratio	Peak Transactions Per Day (millions)	Capacity Transactions Per Day (billions)	Average Latency (3)	Median Latency (3)	10th Percentile Latency	90th Percentile Latency	99th Percentile Latency	
1Q10	100.00%	215	0.25	1.2:1	n/a	n/a	n/a	619	8	4.04	n/a	n/a	n/a	n/a
2Q10	99.99%	233	0.25	1.1:1	n/a	n/a	n/a	1112	8	6.43	n/a	n/a	n/a	n/a
3Q10	99.99%	299	0.30	1.0:1	n/a	n/a	n/a	849	8	11.45	n/a	n/a	n/a	n/a
4Q10	99.99%	309	0.35	1.1:1	n/a	n/a	n/a	574	8	3.27	n/a	n/a	n/a	n/a
1Q11	100.00%	390	0.50	1.3:1	n/a	n/a	n/a	971	8	1.17	n/a	n/a	n/a	n/a
2Q11	100.00%	453	0.75	1.7:1	n/a	n/a	n/a	839	8	0.52	n/a	n/a	n/a	n/a
3Q11	100.00%	567	1.00	1.8:1	n/a	n/a	n/a	1919	8	0.47	n/a	n/a	n/a	n/a
4Q11	100.00%	581	1.25	2.2:1	n/a	n/a	n/a	1418	8	0.43	n/a	n/a	n/a	n/a
1Q12	100.00%	561	1.50	2.7:1	n/a	n/a	n/a	743	16	0.35	n/a	n/a	n/a	n/a
2Q12	100.00%	553	1.75	3.2:1	n/a	n/a	n/a	809	16	0.30	n/a	n/a	n/a	n/a
3Q12	99.99%	567	2.00	3.5:1	n/a	n/a	n/a	559	16	0.28	n/a	n/a	n/a	n/a
4Q12	100.00%	474	2.25	4.7:1	n/a	n/a	n/a	617	16	0.26	n/a	n/a	n/a	n/a
1Q13	99.99%	508	2.50	4.9:1	n/a	n/a	n/a	607	16	0.69	n/a	n/a	n/a	n/a
2Q13	100.00%	575	2.50	4.3:1	n/a	n/a	n/a	744	16	0.59	n/a	n/a	1.02	n/a
3Q13	100.00%	458	2.75	6.0:1	116.2	275	2.4:1	547	16	0.40	n/a	n/a	0.65	n/a
4Q13	100.00%	516	3.00	5.8:1	120.7	300	2.5:1	634	16	0.40	n/a	n/a	0.65	n/a
1Q14	100.00%	565	n/a	n/a	121.1	300	2.5:1	710	16	0.45	n/a	n/a	0.90	n/a
2Q14	99.99%	559	n/a	n/a	131.7	300	2.3:1	833	16	0.44	n/a	n/a	0.76	n/a
3Q14	100.00%	476	n/a	n/a	121.1	325	2.7:1	596	16	0.45	n/a	n/a	0.88	n/a
4Q14	99.99%	517	n/a	n/a	141.8	325	2.3:1	1397	16	0.41	n/a	n/a	0.75	n/a
1Q15	100.00%	510	n/a	n/a	146.4	350	2.4:1	849	16	0.39	n/a	n/a	0.68	n/a
2Q15	100.00%	526	n/a	n/a	142.6	350	2.5:1	625	16	0.46	n/a	n/a	1.02	n/a
3Q15	100.00%	583	n/a	n/a	158.4	375	2.4:1	952	16	0.51	0.23	n/a	1.13	n/a
4Q15	99.99%	652	n/a	n/a	162.3	375	2.3:1	910	16	0.44	0.21	n/a	0.93	n/a
1Q16	100.00%	615	n/a	n/a	163.3	392	2.4:1	1338	16	0.49	0.22	0.15	1.08	3.89
2Q16	100.00%	618	n/a	n/a	168.4	400	2.4:1	1093	16	0.49	0.22	0.15	1.09	4.00
3Q16	100.00%	541	n/a	n/a	185.5	450	2.4:1	1027	16	0.47	0.21	0.15	0.97	3.86
4Q16	99.99%	785	n/a	n/a	210.8	450	2.1:1	1150	16	0.26	0.08	0.06	0.28	1.57
1Q17	100.00%	530	n/a	n/a	175.7	450	2.6:1	720	16	0.15	0.08	0.06	0.26	1.10
2Q17	100.00%	543	n/a	n/a	189.2	450	2.4:1	676	16	0.15	0.08	0.06	0.28	1.11
3Q17	100.00%	519	n/a	n/a	165.4	450	2.7:1	546	16	0.14	0.08	0.06	0.25	1.02
4Q17	100.00%	527	n/a	n/a	187.2	450	2.4:1	782	16	0.12	0.09	0.07	0.16	0.72
1Q18	100.00%	691	n/a	n/a	182.6	450	2.5:1	1571	16	0.13	0.08	0.07	0.18	0.86
2Q18	100.00%	660	n/a	n/a	195.5	450	2.3:1	985	16	0.13	0.08	0.07	0.17	0.86
3Q18	100.00%	790	n/a	n/a	232.6	450	1.9:1	684	16	0.13	0.09	0.07	0.18	0.81
4Q18	100.00%	942	n/a	n/a	249.6	450	1.8:1	1755	16	0.10	0.06	0.05	0.10	0.37
1Q19	100.00%	853	n/a	n/a	265.1	450	1.7:1	1140	16	0.08	0.06	0.05	0.09	0.34

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1Q10	100.00%	49.6	50	1.0:1	n/a	n/a	n/a	36.8	200	6.46	n/a	n/a	n/a	n/a
2Q10	99.99%	42.9	50	1.2:1	n/a	n/a	n/a	55.5	200	6.17	n/a	n/a	n/a	n/a
3Q10	99.99%	42.1	60	1.4:1	n/a	n/a	n/a	38.3	200	5.73	n/a	n/a	n/a	n/a
4Q10	99.99%	48.4	75	1.5:1	n/a	n/a	n/a	30.2	200	3.24	n/a	n/a	n/a	n/a
1Q11	100.00%	57.2	100	1.7:1	n/a	n/a	n/a	36.9	200	1.96	n/a	n/a	n/a	n/a
2Q11	99.99%	78.2	150	1.9:1	n/a	n/a	n/a	31.6	200	1.25	n/a	n/a	n/a	n/a
3Q11	100.00%	77.8	200	2.6:1	n/a	n/a	n/a	61.6	200	0.80	n/a	n/a	n/a	n/a
4Q11	100.00%	67.5	250	3.7:1	n/a	n/a	n/a	44.8	200	0.73	n/a	n/a	n/a	n/a
1Q12	100.00%	57.2	300	5.2:1	n/a	n/a	n/a	26.9	1000	0.58	n/a	n/a	n/a	n/a
2Q12	100.00%	80.7	350	4.3:1	n/a	n/a	n/a	25.9	1000	0.37	n/a	n/a	n/a	n/a
3Q12	99.99%	72.4	400	5.5:1	n/a	n/a	n/a	25.5	1000	0.36	n/a	n/a	n/a	n/a
4Q12	100.00%	59.5	450	7.6:1	n/a	n/a	n/a	22.8	1000	0.32	n/a	n/a	n/a	n/a
1Q13	100.00%	67.7	500	7.4:1	n/a	n/a	n/a	22.2	1000	0.48	n/a	n/a	n/a	n/a
2Q13	100.00%	68.7	500	7.3:1	n/a	n/a	n/a	27.9	1000	0.38	n/a	n/a	0.50	n/a
3Q13	100.00%	70.8	550	7.8:1	21.4	55	2.6:1	25.0	1000	0.38	n/a	n/a	0.54	n/a
4Q13	100.00%	91.1	600	6.6:1	20.6	60	2.9:1	30.4	1000	0.42	n/a	n/a	0.53	n/a
1Q14	100.00%	111.8	n/a	n/a	21.8	60	2.8:1	36.5	1000	0.51	n/a	n/a	0.71	n/a
2Q14	99.99%	98.7	n/a	n/a	23.5	60	2.6:1	30.0	1000	0.51	n/a	n/a	0.66	n/a
3Q14	100.00%	81.7	n/a	n/a	22.7	65	2.9:1	29.2	1000	0.51	n/a	n/a	0.66	n/a
4Q14	99.99%	109.7	n/a	n/a	24.2	65	2.7:1	49.6	1000	0.45	n/a	n/a	0.60	n/a
1Q15	100.00%	85.5	n/a	n/a	22.1	70	3.2:1	34.6	1000	0.45	n/a	n/a	0.59	n/a
2Q15	100.00%	111.6	n/a	n/a	31.8	70	2.2:1	31.6	1000	0.34	n/a	n/a	0.43	n/a
3Q15	100.00%	79.6	n/a	n/a	27.1	75	2.8:1	56.0	1000	0.32	0.24	n/a	0.41	n/a
4Q15	100.00%	128.1	n/a	n/a	43.7	75	1.7:1	38.0	1000	0.31	0.24	n/a	0.41	n/a
1Q16	100.00%	123.0	n/a	n/a	42.4	86	2.0:1	49.8	1000	0.33	0.25	0.16	0.43	1.73
2Q16	100.00%	91.9	n/a	n/a	37.4	96	2.6:1	45.6	1000	0.34	0.24	0.19	0.45	1.73
3Q16	100.00%	98.2	n/a	n/a	41.5	105	2.5:1	33.8	1000	0.32	0.24	0.20	0.44	1.65
4Q16	100.00%	94.3	n/a	n/a	38.7	105	2.7:1	49.3	1000	0.25	0.16	0.13	0.31	1.41
1Q17	100.00%	121.8	n/a	n/a	45.4	105	2.3:1	32.9	1000	0.17	0.12	0.08	0.22	1.02
2Q17	100.00%	98.2	n/a	n/a	51.0	105	2.1:1	32.4	1000	0.15	0.11	0.08	0.21	0.85
3Q17	100.00%	88.3	n/a	n/a	46.9	105	2.2:1	29.2	1000	0.14	0.11	0.08	0.20	0.71
4Q17	100.00%	67.6	n/a	n/a	39.6	105	2.7:1	38.5	1000	0.15	0.12	0.09	0.21	0.71
1Q18	100.00%	68.0	n/a	n/a	35.8	105	2.9:1	57.3	1000	0.15	0.12	0.09	0.20	0.66
2Q18	100.00%	77.3	n/a	n/a	35.8	105	2.9:1	40.2	1000	0.15	0.12	0.09	0.20	0.72
3Q18	100.00%	77.4	n/a	n/a	31.0	105	3.4:1	40.1	1000	0.15	0.12	0.09	0.21	0.65
4Q18	99.99%	91.9	n/a	n/a	39.8	105	2.6:1	55.3	1000	0.16	0.11	0.09	0.19	0.78
1Q19	100.00%	77.2	n/a	n/a	38.3	105	2.7:1	41.7	1000	0.15	0.10	0.08	0.20	0.82

(1) Service level guidelines: (A) 99.98% system availability; (B) 10 minute recovery time for full system failures; (C) Operations production support 24x5 in primary and backup data center and test support provided on Tuesdays, Thursdays, and Saturdays.

(2) Beginning 1Q14, capacity planning interval changed from 1-second to 100-milliseconds.

(3) Prior to 1Q13, latency was measured from the time a message received from a Participant was time-stamped by CTS/CQS, to the time that processing the message was completed.

Beginning 1Q13, message latency is measured beginning with the time-stamp taken as an inbound Participant message arrives at the network entrance to the CTS/CQS environment, through processing by the system into a consolidated message for Data Recipients, to the time-stamp taken as the outbound message arrives at the network exit from the environment. Latency is represented in milliseconds.