

Key Operating Metrics of U.S. Options Securities Information Processor (OPRA SIP)

	System Availability (1)	Peak Messages Per Second (millions)	Capacity Messages Per Second (millions)	Capacity vs Peak Ratio	Peak Messages Per 100 Milliseconds (millions) (2)	Capacity Messages Per 100 Milliseconds (millions)	Capacity vs Peak Ratio	Peak Transactions Per Day (billions)	Capacity Transactions Per Day (billions)	Average Latency (3)	Median Latency	10th Percentile Latency	90th Percentile Latency	99th Percentile Latency
1Q10	100.00%	1.4	3.2	2.3:1	n/a	n/a	n/a	3.9	24	2.19	n/a	n/a	n/a	n/a
2Q10	100.00%	1.7	3.2	1.9:1	n/a	n/a	n/a	6.3	24	2.08	n/a	n/a	n/a	n/a
3Q10	100.00%	2.0	4.2	2.1:1	n/a	n/a	n/a	5.1	24	1.25	n/a	n/a	n/a	n/a
4Q10	100.00%	2.2	4.2	2.0:1	n/a	n/a	n/a	4.5	24	1.32	n/a	n/a	n/a	n/a
1Q11	99.99%	2.6	6.0	2.3:1	n/a	n/a	n/a	8.0	24	0.96	n/a	n/a	n/a	n/a
2Q11	100.00%	3.7	6.0	1.6:1	n/a	n/a	n/a	7.1	48	0.76	n/a	n/a	n/a	n/a
3Q11	100.00%	3.9	6.0	1.5:1	n/a	n/a	n/a	14.6	48	0.72	n/a	n/a	n/a	n/a
4Q11	100.00%	3.9	7.0	1.8:1	n/a	n/a	n/a	11.2	48	0.61	n/a	n/a	n/a	n/a
1Q12	99.99%	4.6	10.5	2.3:1	n/a	n/a	n/a	5.2	48	0.47	n/a	n/a	n/a	n/a
2Q12	100.00%	4.6	10.5	2.3:1	n/a	n/a	n/a	6.2	48	0.40	n/a	n/a	n/a	n/a
3Q12	100.00%	4.6	12.0	2.6:1	n/a	n/a	n/a	5.6	48	0.37	n/a	n/a	n/a	n/a
4Q12	100.00%	5.0	12.0	2.4:1	n/a	n/a	n/a	7.6	48	0.34	n/a	n/a	n/a	n/a
1Q13	100.00%	6.8	15.0	2.2:1	n/a	n/a	n/a	7.1	48	0.82	n/a	n/a	n/a	n/a
2Q13	100.00%	6.8	15.0	2.2:1	n/a	n/a	n/a	11.1	48	0.83	n/a	n/a	1.8	n/a
3Q13	99.96%	6.8	15.0	2.2:1	0.9	1.5	1.6:1	8.5	48	0.85	n/a	n/a	1.8	n/a
4Q13	100.00%	6.8	21.0	3.1:1	1.0	3.2	3.1:1	11.2	48	0.85	n/a	n/a	1.8	n/a
1Q14	100.00%	7.5	n/a	n/a	1.2	3.2	2.7:1	12.0	75	0.78	n/a	n/a	1.7	n/a
2Q14	100.00%	7.9	n/a	n/a	1.3	3.2	2.5:1	13.9	100	0.55	n/a	n/a	1.2	n/a
3Q14	100.00%	7.9	n/a	n/a	1.4	5.0	3.6:1	9.9	100	0.51	n/a	n/a	1.2	n/a
4Q14	99.98%	9.6	n/a	n/a	1.6	5.5	3.4:1	15.2	100	0.40	n/a	n/a	0.75	n/a
1Q15	100.00%	10.2	n/a	n/a	1.6	5.5	3.4:1	11.0	100	0.35	n/a	n/a	0.60	n/a
2Q15	100.00%	8.7	n/a	n/a	1.6	5.5	3.4:1	10.1	100	0.37	n/a	n/a	0.62	n/a
3Q15	100.00%	9.8	n/a	n/a	1.7	5.5	3.2:1	18.0	100	0.41	0.21	n/a	0.70	n/a
4Q15	99.99%	9.9	n/a	n/a	1.9	5.5	2.9:1	15.3	100	0.39	0.20	n/a	0.64	n/a
1Q16	99.99%	11.1	n/a	n/a	2.3	6.0	2.6:1	23.1	100	0.40	0.15	0.11	0.59	4.44
2Q16	99.99%	11.3	n/a	n/a	2.2	6.5	3.0:1	14.7	150	0.11	0.06	0.05	0.13	0.87
3Q16	100.00%	10.4	n/a	n/a	3.1	7.3	2.4:1	15.0	200	0.11	0.06	0.05	0.12	0.70
4Q16	100.00%	14.5	n/a	n/a	2.8	7.3	2.6:1	17.7	200	0.10	0.05	0.04	0.12	0.67
1Q17	100.00%	10.5	n/a	n/a	2.9	7.3	2.5:1	11.4	200	0.08	0.05	0.04	0.11	0.66
2Q17	100.00%	11.0	n/a	n/a	2.2	8.5	3.9:1	16.4	200	0.07	0.04	0.03	0.09	0.61
3Q17	100.00%	12.9	n/a	n/a	2.3	8.5	3.7:1	15.4	200	0.08	0.04	0.03	0.10	0.89
4Q17	100.00%	10.9	n/a	n/a	2.3	8.5	3.6:1	13.9	200	0.08	0.04	0.03	0.10	0.73
1Q18	100.00%	13.5	n/a	n/a	2.8	8.5	3.0:1	30.6	200	0.09	0.04	0.03	0.12	0.92
2Q18	100.00%	13.0	n/a	n/a	2.7	8.5	3.2:1	27.5	200	0.09	0.04	0.03	0.12	0.95
3Q18	100.00%	18.0	n/a	n/a	3.3	8.5	2.6:1	24.4	200	0.15	0.04	0.03	0.12	2.56
4Q18	100.00%	19.8	n/a	n/a	4.2	8.5	2.0:1	45.9	200	0.11	0.04	0.03	0.10	1.65

(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 OPRA, to the time that processing the message was completed. 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 OPRA environment, OPRA 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.