



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 |

| Trade Feed (Tape A&B) | | | | | | | | | | | | | | |
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| System Availability (1) | Peak Messages Per Second (thousands) | Capacity Messages Per Second (thousands) | 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 (millions) | Average Latency (3) | Median Latency (3) | 10th Percentile Latency | 90th Percentile Latency | 99th Percentile Latency | |
| 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 | 100 | 2.4:1 | 33.8 | 1000 | 0.32 | 0.24 | 0.20 | 0.44 | 1.65 |
| 4Q16 | 100.00% | 94.3 | n/a | n/a | 38.7 | 100 | 2.6:1 | 49.3 | 1000 | 0.25 | 0.16 | 0.13 | 0.31 | 1.41 |

(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.