

Sybase® Aleri CEP Platform Performance Testing: STAC Certified



SOLUTIONS OVERVIEW

RESULTS AT A GLANCE

- Mean latency not exceeding approximately 1.5 milliseconds at ingress rates of up to 180,000 order book updates per second and 1.6 ms at 300,000 updates per second.
- 99th percentile latency not exceeding approximately 3.0 milliseconds at ingress rates of up to 180,000 order book updates per second and 3.2 ms at 300,000 updates per second.
- All Aleri components ran on a single Intel-powered, Solaris-based server, including the Aleri adapter for RMDS/ OMM, the Aleri event processing platform, and the STAC test client consuming data from the Aleri platform through the Aleri API.
- With only a 50% increase in the number of cores, Aleri achieved a 67% increase.

The following documents the STAC certification of Sybase's Aleri CEP platform, which was formerly known as the Aleri CEP platform.

VERIFYING CEP PERFORMANCE CLAIMS

Companies that rely on complex event processing (CEP) applications typically have very high performance standards. They require their CEP applications to process event data at very high message rates in scenarios where minimizing latency (the time required to process an event message) is a top priority.

Technology vendors boast about the performance of their solutions in demanding situations, but their claims usually lack independent, verifiable evidence. Recently, Aleri, Sun Microsystems, and Intel jointly commissioned the Securities Technology Analysis Center (STAC) to provide objective performance data on a commercial CEP platform. STAC is an independent organization that provides technology evaluation services to clients in capital markets. They analyzed the Aleri Streaming Platform in two separate tests to provide dual data points to better characterize CEP application performance. The first test involved Intel's quad-core Tigerton processors, and the second test involved Intel's six-core Dunnington processors. All other system specifications remained the same for each test.

The tests represent the first time a vendor has provided demonstrable performance benchmarks for a CEP application.

CREATING REALISTIC TEST CONDITIONS

To simulate real-world conditions, the test used an order book aggregation model that consolidated equity order book data across multiple exchanges. The specific model chosen for testing required the CEP platform to maintain the state of all order books and apply new messages from each exchange as inserts (new orders), updates (changes to an existing order), and deletes (order cancellations). This model involved more intensive processing than models that operate against simple time series data where state maintenance is not required. Also, the test model did not filter data, meaning that every incoming message triggered updates to the output stream.

The test model was fed by the Aleri Reuters OMM adapter, which subscribed to order book data in OMM format from a Reuters RMDS test system. Throughput was measured at the event source, with message rates representing the total number of messages per second being input into the Aleri server. Latency was defined as the time starting when the Reuters RMDS test system first sent the message to the Aleri OMM adapter and ending when the client application subscribing to the output of the Aleri server received the resultant update.

SYSTEM SPECIFICATIONS

Event Processor	Aleri Streaming Platform 2.4.2
Server	SunFire X4450
Processor (test 1) Processor (test 2)	Quad-Core Intel Xeon X7350 2.93 GHz 6-Core Intel Xeon X7460, 2.66 GHz
Processors	4
Operating System	Sun Solaris 10
Cache (test 1) Cache (test 2)	8MB L2 16MB L3
Bus Speed	1066 MHz FSB
Memory	32 GB

RESULTS

For the first benchmark with a quad-core configuration, end-to-end latency was measured for constant order event throughput rates from 20K/sec up to 180K/sec in 20K/sec increments. The second benchmark with the six-core configuration measured throughput rates from 20K/sec up to 300K/sec in 20K/sec increments.

The most telling statistic from the second test is that throughput increased by 67% with just a 50% increase in the number of processor cores. This clearly demonstrates Aleri's scalability across a multi-core architecture. The data used was actual captured market data, played back via STAC utilities that mimicked the dynamics (such as "micro-burstiness") of live market data. Two five-minute runs were used to determine each throughput rate.

The latency statistics for each run were taken from the Aleri RMDS adapter's reading of the order events, beginning with the simulated market feed all the way through the subscribing client's reading of the event from the consolidated order book (which represents the longest derived stream path). This simulates a customer's experience in monitoring latency during the changes in the consolidated order book triggered by an event arriving on the market feed. Please see the official STAC report at <http://www.stacresearch.com/aleri/> for the specific results of each run and for further detail on the certification process.

BENCHMARK TEST 1: QUAD CORE
Throughput
+ 180,000 messages per second
Latency
+ Mean: 1.173 - 1.502 ms, (from 20K to 180K)
+ Medium: 1.009 - 1.479 ms
+ Std Dev: 0.458 - 0.629 ms
+ Min: 0.118 - 0.143 ms
+ 99%: 2.276 - 3.018 ms

BENCHMARK TEST 2: SIX-CORE
Throughput
+ 300,000 messages per second
Latency
+ Mean: 1.296 - 1.568 ms, (from 20K to 300K)
+ Medium: 1.177 - 1.502 ms
+ Std Dev: 0.567 - 1.104 ms
+ Min: 0.091 - 0.115 ms
+ 99%: 2.479 - 3.165 ms