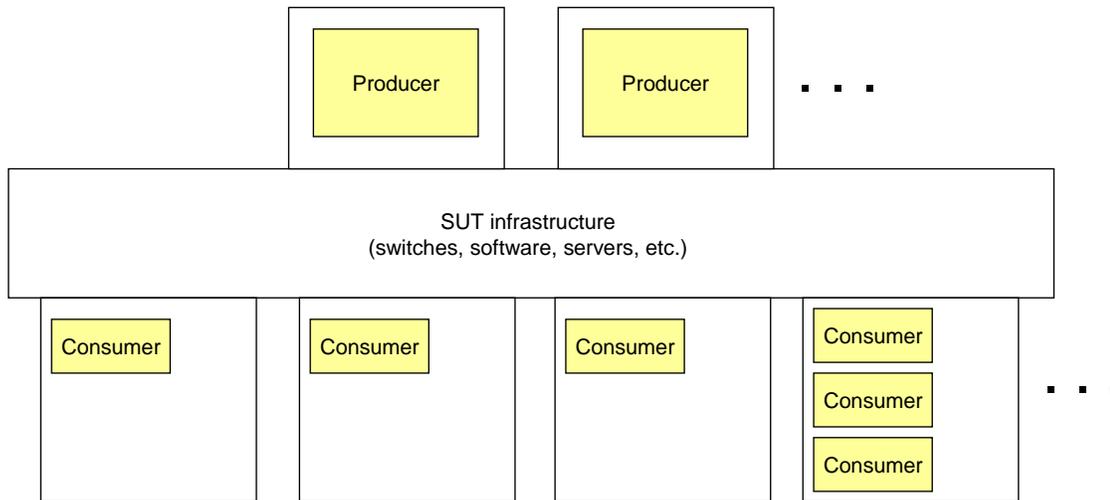




## Overview of the STAC-M2 Test Harness (v1.0)

The STAC-M2 Benchmark specifications test the ability of a solution such as messaging middleware to handle real-time market data in a variety of configurations. The specs reflect the input of seven leading trading firms and six vendors of high-performance messaging. They provide key performance metrics such as throughput, latency, power efficiency, and CPU/memory consumption under several scenarios.

As shown in Figure 1, the software binaries required for a STAC-M2 test are Producer and Consumer applications written to interface to the “stack under test” (SUT). These incorporate the STAC-M2 Library to control behavior. The test specs make no assumption about the architecture of the SUT (brokerless vs broker-based, appliance vs software, Ethernet vs InfiniBand, etc.). The fundamental hardware requirement is a small number of machines to host the Producers and Consumers. Some specs are designed to enable arbitrarily large test harnesses for scale testing, but such testing is not required. STAC-M2 does not require any proprietary hardware for time sync or wire capture.



**Figure 1 – High-level view of STAC-M2 test harness**

The harness uses a "reflection" methodology for round-trip latency measurement, illustrated in Figure 2. A Producer transmits a “primary” message; a Consumer consumes the message and selectively republishes it as a “reflected” message; and the Producer consumes the reflected message. Multiple Consumers can receive primary messages from a given Producer, which in turn can receive reflected messages from multiple Consumers. Latency is measured from the earliest moment a primary message is available for sending in the Producer to the moment the reflected message payload is available for consumption in the proper format in the Producer (ReceiveTime minus SupplyTime in Figure 2). This result is divided by two to provide a “Hybrid Latency.” Hybrid Latency is indicative of one-way latency but may not be exact, because the reflected message rate is always a fraction of the primary message rate.

Version 1.0 of STAC-M2 draws from equities and options use cases: smart order routing, pairs trading, market-making, and black-box trading. Some specs emulate “latency minimizing” deployments, where application owners tend to over-provision resources to avoid contention. Other specs emulate “cost-minimizing” deployments, where application owners care more about total cost, meaning that they may load multiple apps onto a given machine.

The specs vary the number of Producers and Consumers, the watchlist sizes and commonality among Consumers, whether the SUT must cache, and whether it must deliver parsed or opaque messages. They test common exception conditions like slow Consumers and application restarts. Version 1.0 supplies messages modeled on US equities order-book data, at steady-state rates. Future versions will include more data types and complex timing patterns.

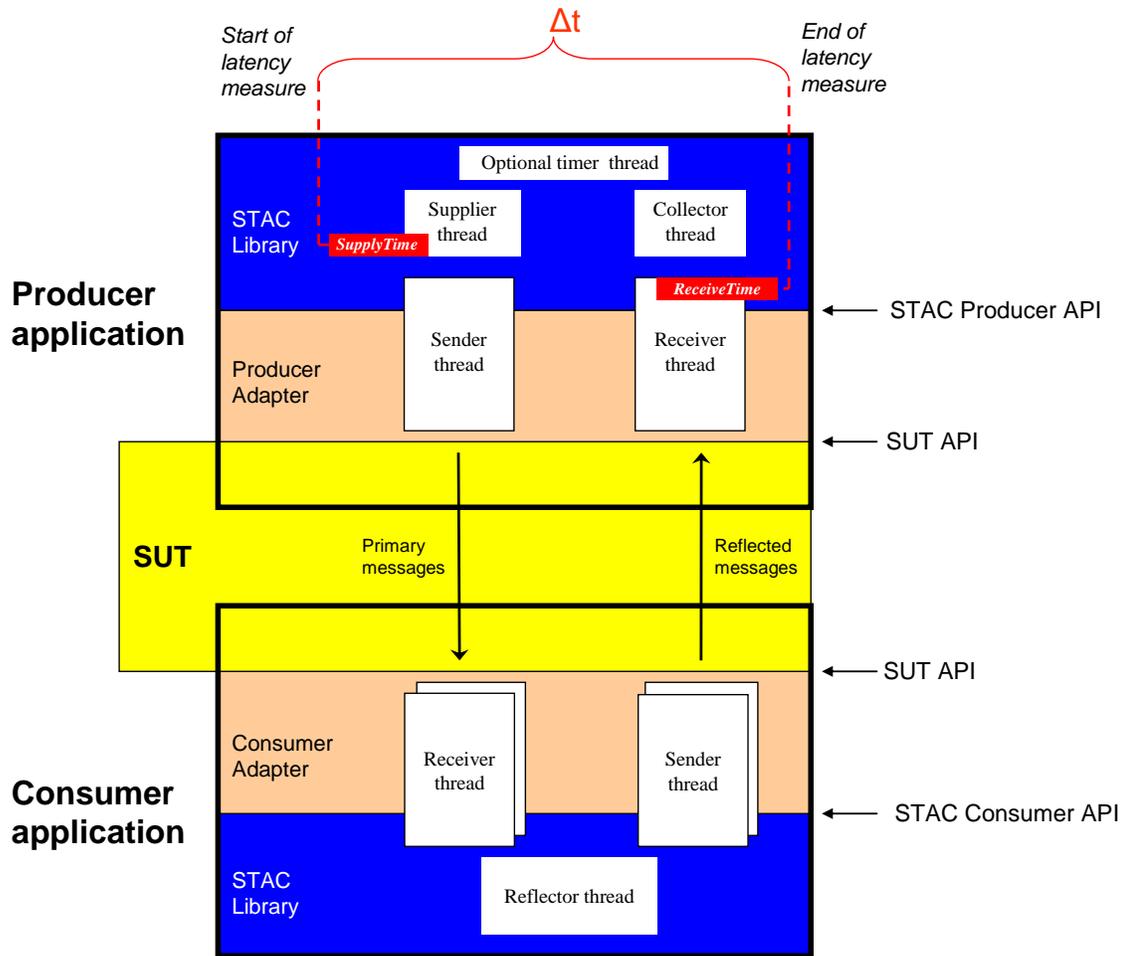


Figure 2 – Component-level view of STAC-M2 Producer/Consumer methodology

## Using the STAC-M2 Test Harness in your own lab

STAC Benchmark Council members who license the STAC-M2 Test Harness can run rigorous STAC-M2 tests on any system of their choosing. By comparing your results to published STAC Reports, this enables you to “mark your system to market” in the privacy of your own lab and quickly generate results for many system configurations.

The STAC-M2 Test Harness is a flexible toolset that you can adapt to run your own test specifications. For example, you can specify new data patterns, run an arbitrarily large number of Producers and Consumers, or alter the behavior of slow consumers. By handling the details of test generation, measurement, and reporting, the STAC-M2 Test Harness allows you to spend more time understanding and optimizing the technologies you’re testing.

The STAC-M2 Test Harness package consists of:

- The latest STAC-M2 Benchmark Specifications
- Standard configuration and data files required to run STAC-M2 test sequences
- Tools to create your own data patterns (message types, sizes, fields, etc.)
- Analysis tools that generate throughput and latency statistics and create a full report with charts and tables
- Documentation for developers and testers, plus access to the online STAC-M2 Practitioner’s Forum
- Ability to use STAC Packs (pre-optimized STAC-M2 Producers and Consumers) from participating vendors
- STAC Library (‘C’) with Developers Guide, API Reference Manual, and example code that enable you to create Producer and Consumer applications for any proprietary or off-the-shelf messaging system. (Ask STAC for supported compilers and platforms.)

***For more information, please contact [council@STACresearch.com](mailto:council@STACresearch.com).***