

# TREP Infrastructure Testing & Capacity Planning

## Meeting the OPRA Challenge

### The Issue

One of North America's largest Tier 1 banking institutions was experiencing occasional disruptions of service in their Options Trading infrastructure. These disruptions were typically related to their OPRA data but were potentially problematic for their IDN data as well. While the disruptions were infrequent, they could pose potentially serious trading disruptions as they typically occurred during unusually high market activity.

### The Choices

The bank's trading groups mandated that in order to prevent these disruptions in the future, all of the TREP infrastructure would have to be regularly tested. The mandate required testing with real time update rates as well as projected increased market data rates. The bank's universe of symbols across their market data feeds is well over 1 million RICs. The QA group required a test environment that could produce these update rates and allow for modern automated test methodologies to be applied.

The bank's QA group turned to CodeStreet ReplayService for their solution.

### The Solution

Pouring random data at increasing rates into an TREP environment is a fairly common method of testing market data environments. However, repeating the same update does not recreate the issues typically observed under high stress conditions. For testing to be effective, the test data must be realistic and mimic actual conditions observed or anticipated in the future. CodeStreet ReplayService for TREP meets these needs.

CodeStreet engineers built a recording backbone of ReplayServers capable of recording hundreds of thousands of RICs at market rates. Upon replay, the updates can be replayed preserving timing relationships, or accelerated to simulate extremely high rates, scalable to the most severe levels anticipated. By employing ReplayService in a variety of tests, the bank was able to determine the anticipated performance of its infrastructure under a wide range of repeatable scenarios. Having repeatable scenarios allowed the bank to tune its infrastructure and observe and measure the improvements the adjustments produced.

### The Deployment

Using the recording backbone, the bank creates daily recordings of over 250,000 RICs. These recordings are fed into the QA market data environment with ReplayService simulating an RDF data feed at whatever rate the test requires. The powerful features of ReplayService allow for automated testing of specific scenarios including TREP error conditions, dynamic scenario testing and functional testing of downstream applications. Once a quarter, the QA group performs after hours testing of the production TREP environment to ensure its components are robust and failsafe.

The QA group also built repeatable tests that continually and automatically test, revealing network or application latency and capacity issues.

### The Benefits

The client achieved significant savings by automating a complex testing process where none existed before. This has resulted in uncovering application performance deficiencies and TREP throughput issues. The savings that result from uncovering these issues in advance of a potential failure during market hours are sizable.

There are significant residual benefits to this deployment as well. Now the institution has a fully automated after hours development environment as well as a library of regression tests for their application UAT and QA groups. The savings in man hours alone for the development groups by improving efficiency and automating their test processes provided a rapid ROI for the ReplayService deployment.

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