# Case Study: Network Capacity and Latency Testing for a Trading Platform

1. BACKGROUND

As market data volumes continue to grow, trading systems face significant technological challenges. To be successful in today's highly competitive market, a system has to satisfy a number of aggressive non-functional requirements, namely: low latency, high capacity and high availability.
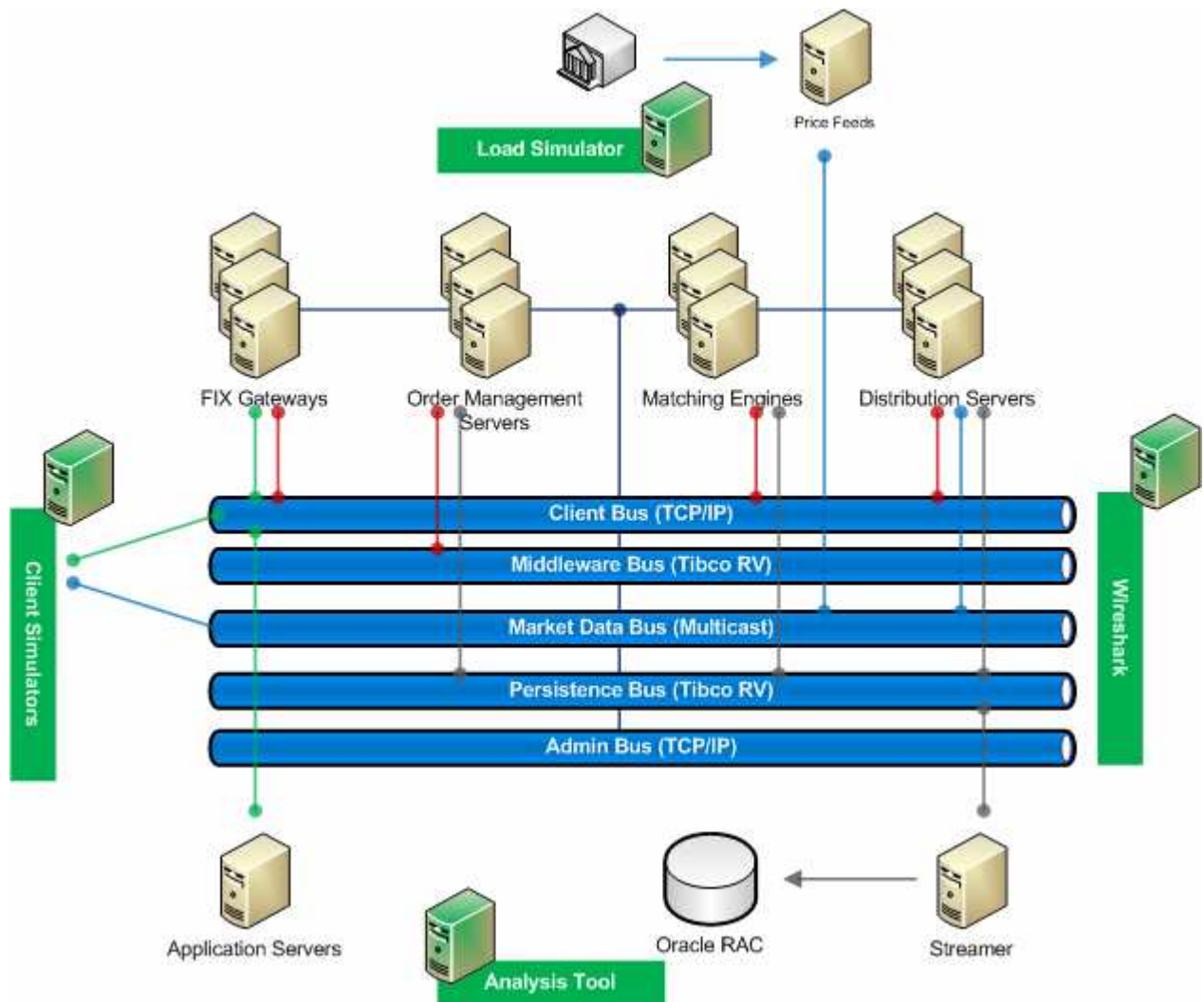
2. CHALLENGE

The client, a new pan-European exchange, needed to accurately benchmark performance and capacity of the network infrastructure behind their advanced trading platform. To optimize internal communications, the network was split into several VLANs: client, market data, middleware, persistence, and administrative. A set of firewalls, VPNs and communication lines existed between the system and clients/suppliers. A dedicated line was responsible for replication between primary and backup data centers. Taking into account internal resource availability and the complexity of the task, the client's management team decided to engage Allied Testing to assist IT Operations with network testing.

3. ALLIED'S APPROACH

The project started with research phase, during which Allied's analyst collected all relevant documentation regarding protocols and transports, transaction volumetric and network organization. A few gaps were identified in the available data, which Allied team closed by additionally investigating the issue.

The next step was a static analysis of the data based on a realistic business model and volumetric in order to identify theoretical network limitation.

Client's IT Operations and the Allied team executed simulated tests in pre-production and production environments to measure real network capacity. In order to run the tests, the team had to use multi-threaded injectors and sinks for simulated external inbound and outbound data flows. Some of the tools were already available within network operations team, while others required additional development and fine tuning to satisfy project requirements.

The test system was monitored using the same set of tools that is used to support the production system. Additionally, Wireshark capture was used to verify that no packets were lost under stress. During the tests, the team identified and fixed a serious issue with NFS configuration. Stress testing, latency measurements, and recovery testing were also conducted, which required well coordinated efforts between the test team and IT Operations.

4. RESULTS

All results were obtained in a very short period, as the system was being delivered on a very aggressive schedule.

The project accomplished the following:

▶ Systems technical capability to satisfy projected volumes was successfully validated

▶ The client received accurate measurements of the impact of networks, firewalls and sub-components on the overall latency

▶ Disaster Recovery link was verified under stress conditions