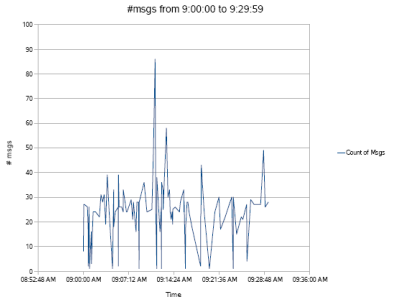
BACKGROUND

Since 1867 when the New York Stock Exchange first opened, time has been of the essence and so the saying: “time is money”, applies to the financial-technology world. Different systems and methods have been employed over the years to ensure that the time period is efficiently utilized to produce maximum profit achievable.

In this day and age the demand for information to be sent over long distances between buyers and sellers during a very short period of time has increased tremendously with the quote volume doubling every year, this leads to problems such as overload of the system as a whole and In more technical terms bandwidth not keeping up with the volume at a particular instance(s) in time and there is high latency.



Options Price Reporting Authority (OPRA)

OPRA provides, through Market Data Vendors, last sale information and current options quotations acquired from a group of Participant Exchanges designated as the Options Price Reporting Authority. Current OPRA participants include: AMEX, BSE, CBOE, ISE, NASDAQ, NYSE Arca, and PHLX

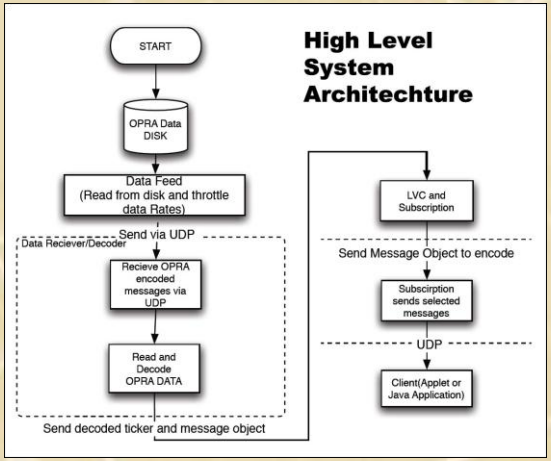
PROBLEM STATEMENT

The aim of IPRO 313 is to create a high performance data ticker plant. Ideally, the data ticker plant has to have a sustained optimal throughput of three million price quotes per second – the current industry state of the art - with minimal latency.

OBJECTIVES

As part of a multi-semesters project, for this semester, the team has set forth the following objectives:

- Explore competitors' solutions as well as available technologies
- Develop a functioning ticker plant system
- Research methods & algorithm to be used
- Determine hardware requirements
- Update the technical user manual
- Create a website contain all information regarding this project



ACCOMPLISHMENT

- We had achieved novel work by testing multiple hashing algorithms and compare results using the statistic significance test.
- Tested hashing algorithms include CRC32, CRC32 Parallel, FNV Hash, OneAtATime, SuperFast Hash, Bob-Jenkins, Alpha numeric, and other widely used hashing algorithms.
- The team has successfully developed a base system capable of processing actual market data as well as handling multiple clients.
  - Client can be ran independently or embedded in a webpage.
- Gathered many statistics about OPRA data.

TECHNICAL CHALLANGES

One of the biggest challenges of this project is understanding the specifications set forth by the real-world market. They include the protocol, the structure of the data feed as well as domain knowledge of the market and financial technology.

Other challenges identified are typical of a computer engineering project. Lack of knowledge and experience on the program-ming language in use, inconsistencies in programming environments used, etc. all add to the obstacles encountered.

Hardware limitation is also an obstacle preventing the team from achieving desirable result.

RECOMMENDATIONS

For future work, different components of the system should be separated to run on separate machines, In depth testing of the system over the network should be performed to accurately assess the system's performance. To further increase the performance, future project should not rely on software alone but also explore more hardware solutions to the problem.

Computer Science Department
Stuart Building - Room 107
3301 S. Dearborn Street
Chicago, IL 60616
http://www.iit.edu/~ipro313s08/

TEAM DESIGNATION

Software Team

The software team is responsible for writing the code for the individual modules that the system consists of as well as testing and optimizing them. Basically, the team is responsible for creating the system.

- Konstantin Roytman, CS – Leader
- Jose Acuna-Rohter, CS
- Jong Su Yoon, CS
- Lance Cooper, CS

Research Team

The team is responsible for researching & testing different algorithms that could be used by the software team.

- Tarun Anupoju, CPE – *Leader*
- Jing Kai Tan, ECE

Web Design/ IPRO Team

The team is responsible for handling all the IPRO deliverables as well as design a website for the project.

- Khanh Duong, CPE – *Leader*
- Martin Kolodziej, ECE
- Oluwaseun Shonubi, ECE

IPRO 313 ULTRA-HIGHSPEED MARKET DATA TICKER SYSTEM

Team Members

Oluwaseun Shonubi, *Team leader*
Khanh Duong
Jose Acuna-Rohter
Tarun Anupoju
Lance Cooper
Martin Kolodziej
Konstantin Roytman
Jing Kai Tan
Jong Su Yoon

Faculty Advisor

Wai Gen Yee
Ben Van Vliet

ILLINOIS INSTITUTE OF TECHNOLOGY
Transforming Lives. Inventing the Future. www.iit.edu