

Stock-mesh: Cross-Platform Mobile Stock Quote Application

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Introduction

Stock-mesh is a **cross-platform mobile stock quote streaming application**. By applying the cutting-edge streaming technology developed by HKUST and **push-based data delivery**, Stock-mesh achieves **sub-second delays** between server and client, bringing faster, more accurate stock quote data to smart-phone users. Stock-mesh supports **iOS, Android and Windows Phone**, and provides a myriad of functions including stock search, portfolio, price notification and financial news to its users.

In recognition of its innovation and technological prowess, Stock-mesh was awarded **“Special Mention” and “Special Mention(Commercial Value)” in Best Research & Innovation(College & Undergraduate) Award, HKICTA2013.**



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Streamphony



Stock-mesh utilizes Streamphony, a streaming software suite developed by the Multimedia Technology Research Center of HKUST. The **sub-stream** model, **optimized-push mechanism** and other innovative designs make Streamphony capable of supporting large-scale live multimedia streaming over public Internet with minimal delays and costs.

With Streamphony, Stock-mesh is able to minimize the delays caused by the traditional pull-based data delivery and bandwidth limits, hence realizing real-time stock quote streaming in mobile phones.

Products and Features

Our applications are available on the Android, iOS and Windows Phone platform. The applications use streaming technology to receive data from our server, so that the data will always be updated and no manual refresh is needed.

There are several main features:

1. Real-time quote of HSI, HSCEI and a selected list of stocks
2. Searching of stocks
3. Charts
4. Portfolio to store the user's selected stocks for quick access
5. Financial news of stocks
6. Price alert can be set up to notify the user when price reaches certain value



Figure: Screenshots of Windows Phone, Android and iOS (from left to right)



Figure: Financial news page of Windows Phone, Android and iOS (from left to right)

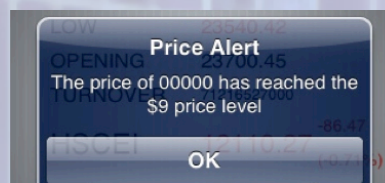
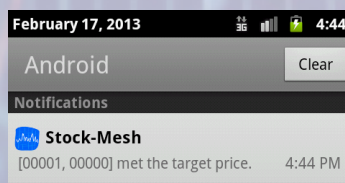
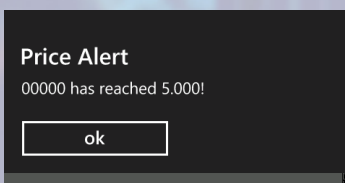
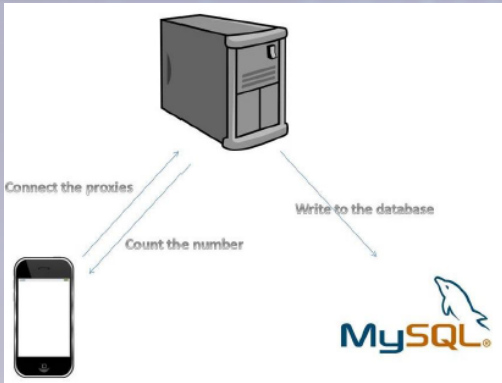


Figure: Price alert (cropped to fit) of Windows Phone, Android and iOS (from left to right)

System Monitoring



To analyze and monitoring the performance and usage of each proxy, a system monitoring webpage is designed. The proxies are continuously collecting data from the mobile devices and the data is written to the database.

There are two types of data collected for system monitoring, including

- 1.) the number of users and
- 2.) the number of views of each stocks.

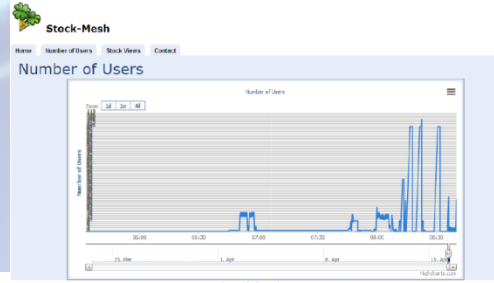


Figure : Number of users in a selected time period

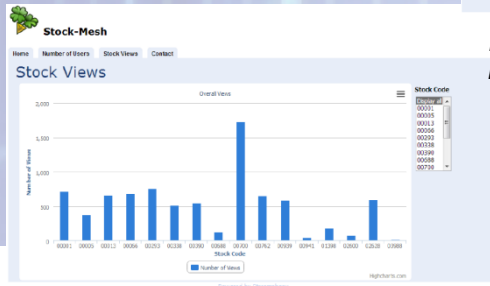


Figure : Summary of number of views

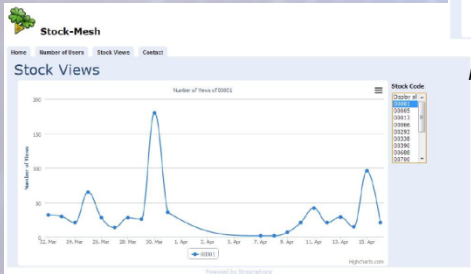
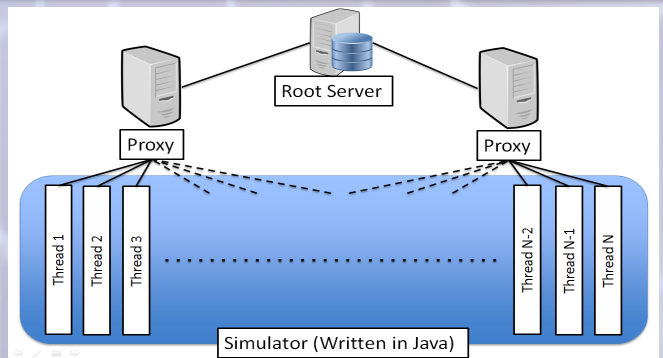


Figure : Number of Views of a particular stock

Data collected will be displayed in the monitoring websites using Highcharts and Highstocks.

Testing and Evaluation

Load testing was employed to test the performance of the system. A Java program was designed for this purpose and it was executed to simulate a large-scale deployment.



Testing results showed that the system is still capable of achieving sub-second delays on average while streaming stock information to the mobile devices from the content server when there are a large amount of connections to the servers.

