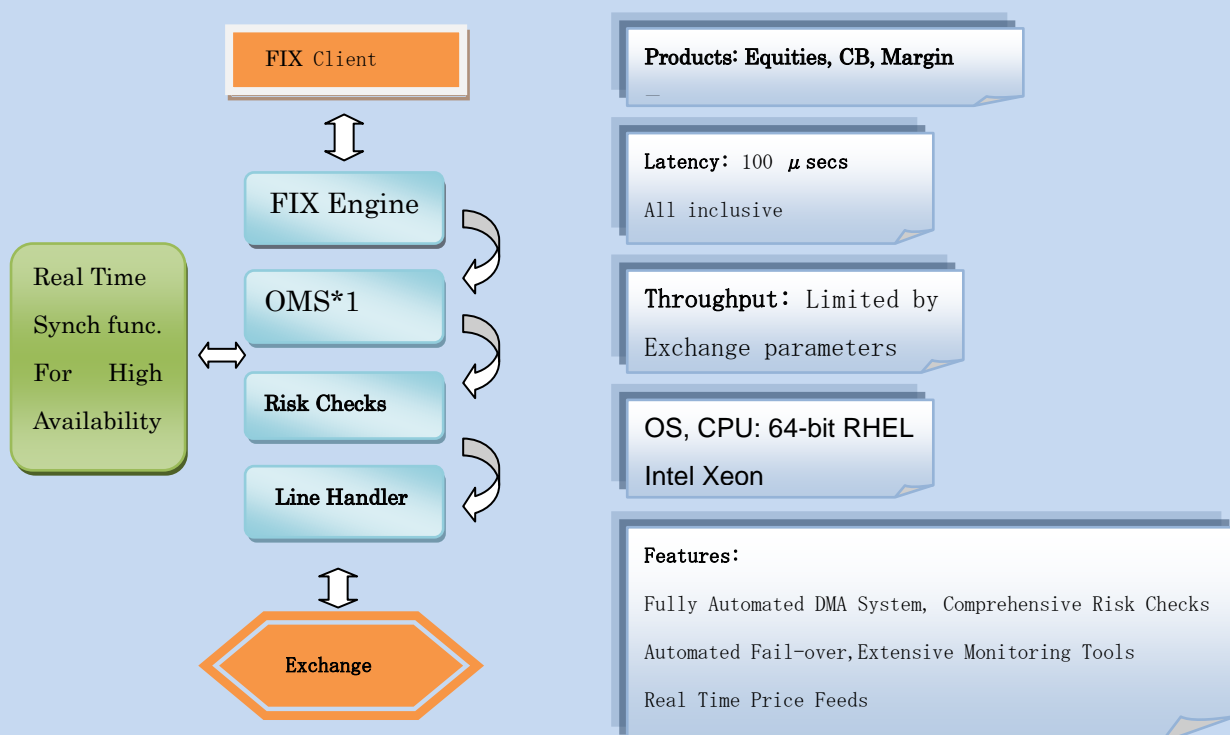# Ryuusei

Low Latency DMA Application

Ryuusei is high-frequency direct market access system (DMA) that allows the brokerage houses to provide no-touch stock exchange access for their clients viz., the buy-side companies. Ryuusei is presently functional at Daiwa Securities, Tokyo and has proven to be very stable and able to handle high throughput; close to two million orders per day and around 6 million messages per day. The modules implemented also include comprehensive risk checks, high-availability and a FIX interface. The order processing time is in the order of 50 micro seconds.

Apart from handling common stocks (cash equities) it also handles CB's, margin orders, multiple-accounts and position-based risk checks for margin orders in addition to the standard risk checks for the automated orders. Ryuusei also does FIX routing for venues that are not the co-location environment (simple destination based order routing using FIX protocol) and pre-market open queuing functionality.
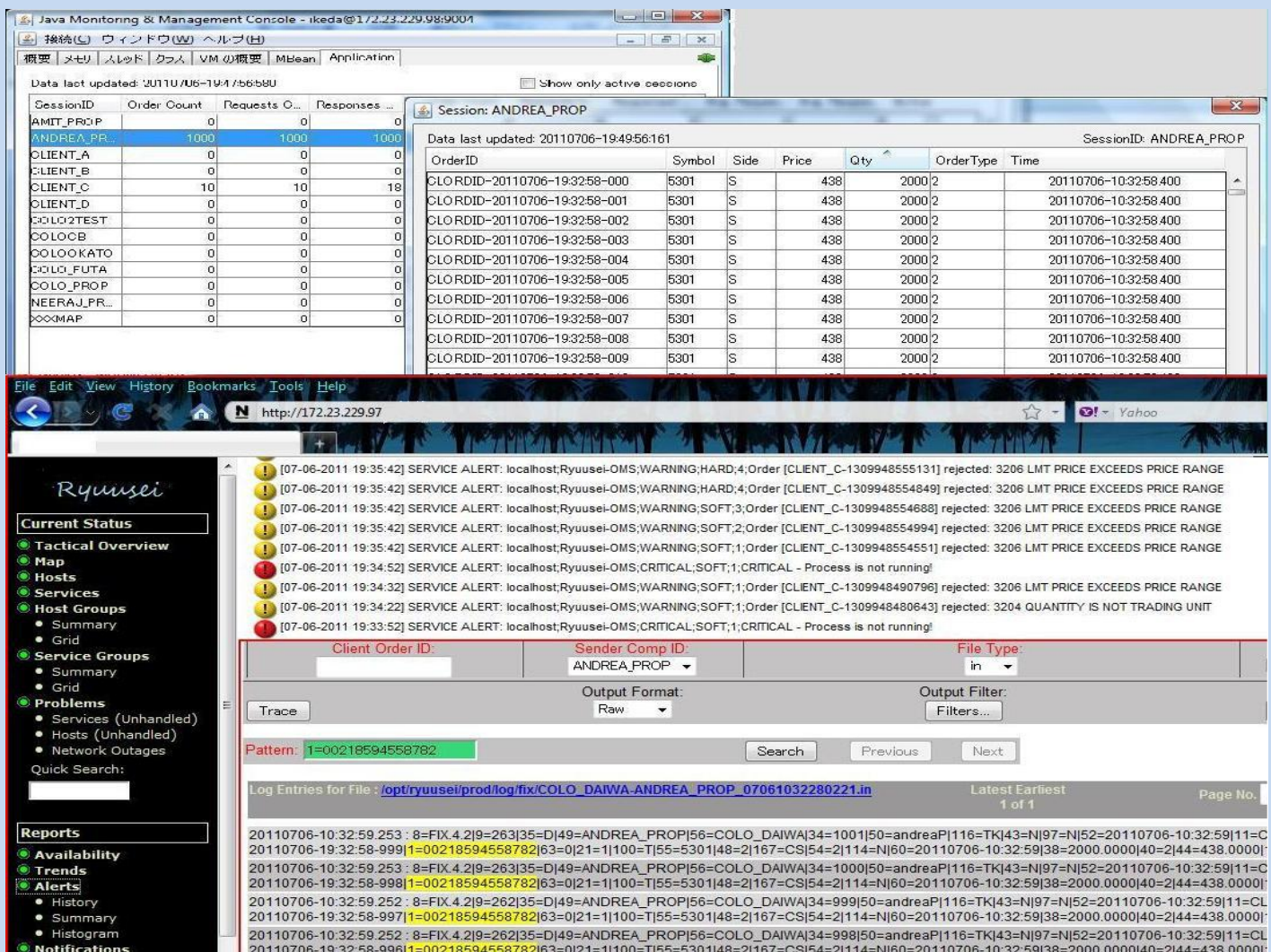
High Frequency DMA System Components

FIX Client

FIX Engine

Real Time Synch func. For High Availability

OMS*1

Risk Checks

Line Handler

Exchange

Products: Equities, CB, Margin

Latency: 100 μ secs
All inclusive

Throughput: Limited by Exchange parameters

OS, CPU: 64-bit RHEL Intel Xeon

Features:
Fully Automated DMA System, Comprehensive Risk Checks
Automated Fail-over, Extensive Monitoring Tools
Real Time Price Feeds

*1: Order Management System

関連記事： **http://fixprotocol.org/discuss/read/b69470ab**

The following components of a standard DMA architecture are implemented in Ryuusei :

1. **FIX Engine**: However native-protocol based solutions to further achieve ultra-low latency are offered as a custom service. (It would be possible to reduce the latency by about 25% if native protocol is used).

1. **Order Management System:** The core of the system which manages orders going to the exchanges (and responses coming back from the exchanges). Manages the state of all the orders and executions in its cache.

2. **Risk Checks :** Ensures that all orders going through to the exchange are subjected to compliance checks to reduce risks (credit, operational, compliance risks as stipulated by different financial regulatory authorities)

3. **Exchange connectivities or Line-handlers:** This is exchange-specific component in Ryuusei that is specifically written for each exchange based on its native protocol.

4. **Automated fail-over or hot-standby :** Optional high-availability feature. Ryuusei guarantees absolutely no message loss in case of HW or OS failure. Application recovery takes less than 30 seconds.

5. **Feed-handler** : Automated market price feeds for current stock prices.

6. **Drop-copy feeds:** This stores all the trade details in a database for settlement processing (in a non-intrusive way so that it does   not affect latency figures).

7. Monitoring: Extensive monitoring for support related activities. In brief the following features are part of default monitoring: session monitoring, Order details of active orders, Single-or-bulk cancel etc.