

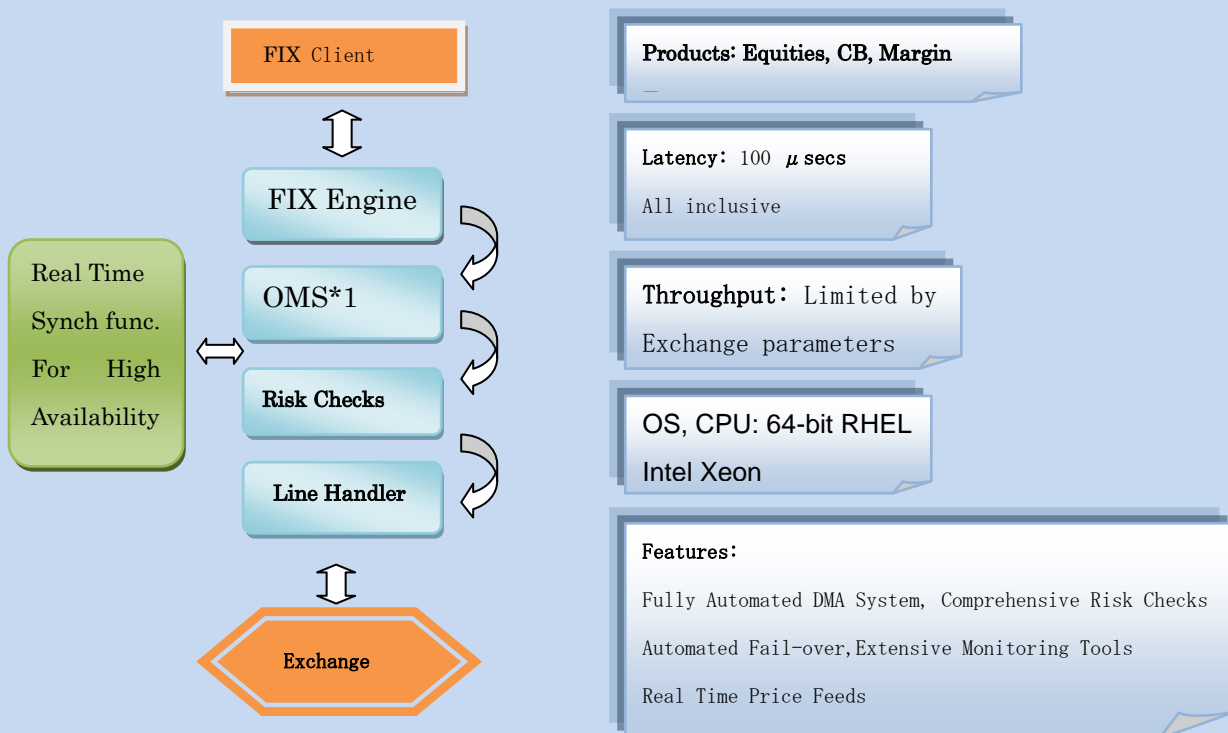
Ryuusei

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

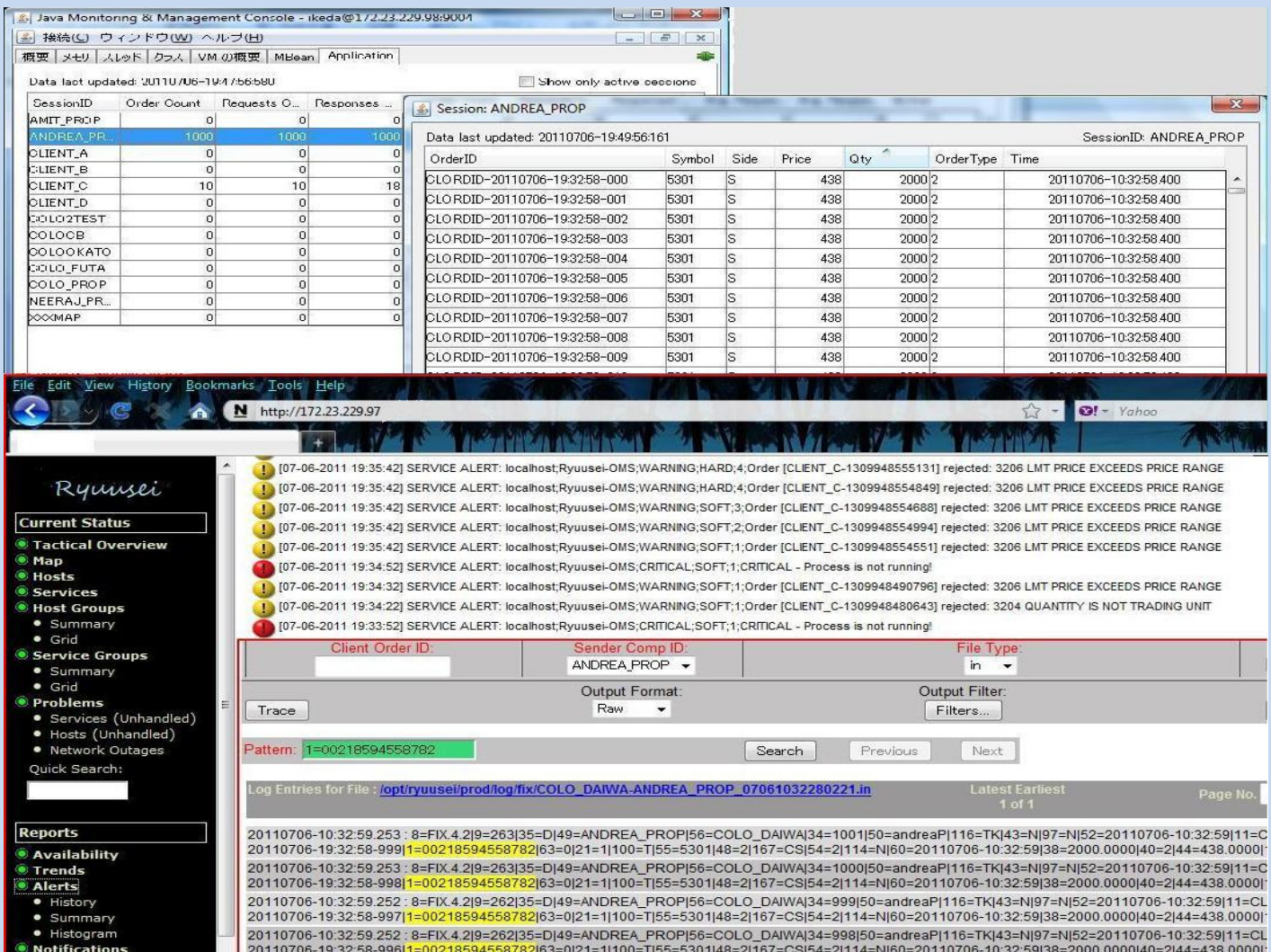


*1: Order Management System

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.



The screenshot displays the Java Monitoring & Management Console interface. The top section shows a table of sessions with columns for SessionID, Order Count, Requests, and Responses. The 'ANDREA_PROP' session is highlighted, showing 1000 orders, 1000 requests, and 1000 responses.

Below this, a detailed view of the 'ANDREA_PROP' session is shown, including a table of orders with columns for OrderID, Symbol, Side, Price, Qty, OrderType, and Time. The orders listed are all for symbol '5301' with a price of 438 and a quantity of 2000.

The bottom section of the console shows a log viewer with several service alerts. The alerts include details such as the time (e.g., 07-06-2011 19:35:42), the alert type (SERVICE ALERT), the severity (WARNING, HARD, SOFT, CRITICAL), and the reason (e.g., '3206 LMT PRICE EXCEEDS PRICE RANGE' or '3204 QUANTITY IS NOT TRADING UNIT').

At the bottom, there is a search interface for log entries. The search pattern is set to '1=00218594558782'. The search results show log entries for the file 'log/ryuusei/prod/log/fix/COLO_DAIWA-ANDREA_PROP_07061032280221.in', with the latest entry being '20110706-10:32:59.253 : 8=FIX.4.2|9=263|35=D|49=ANDREA_PROP|56=COLO_DAIWA|34=100|50=andreaP|116=TK|43=N|97=N|52=20110706-10:32:59|11=C|20110706-19:32:58-999|1=00218594558782|63=0|21=1|100=T|55=5301|48=2|167=CS|54=2|114=N|60=20110706-10:32:59|38=2000.0000|40=2|44=438.0000|'.