
TSE Market Data Services after Launch of Arrowhead

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What is arrowhead?

I-1. Background behind development

Market Environments

Heightened Awareness of Best Execution Obligations

Increased Adoption of Algo and DMA Trading

Competition with PTS and Dark Pool



arrowhead Projects

✓ Build advanced trading engine in terms of latency, capacity, scalability and reliability

✓ Change trading rules to facilitate matching and simplify the process

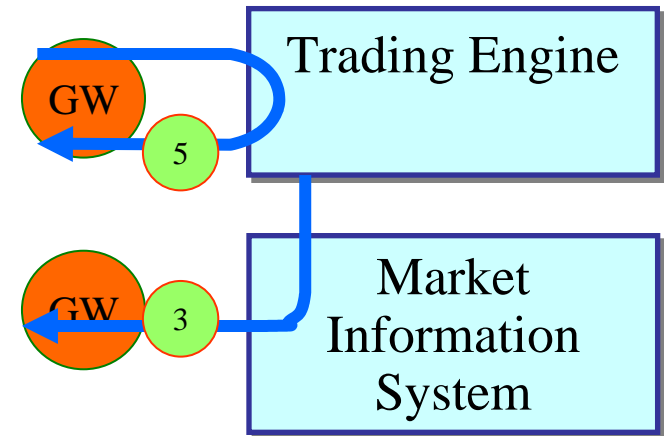
✓ Introduce market data service with expanded quote depth and lowered latency

I-2. Capabilities

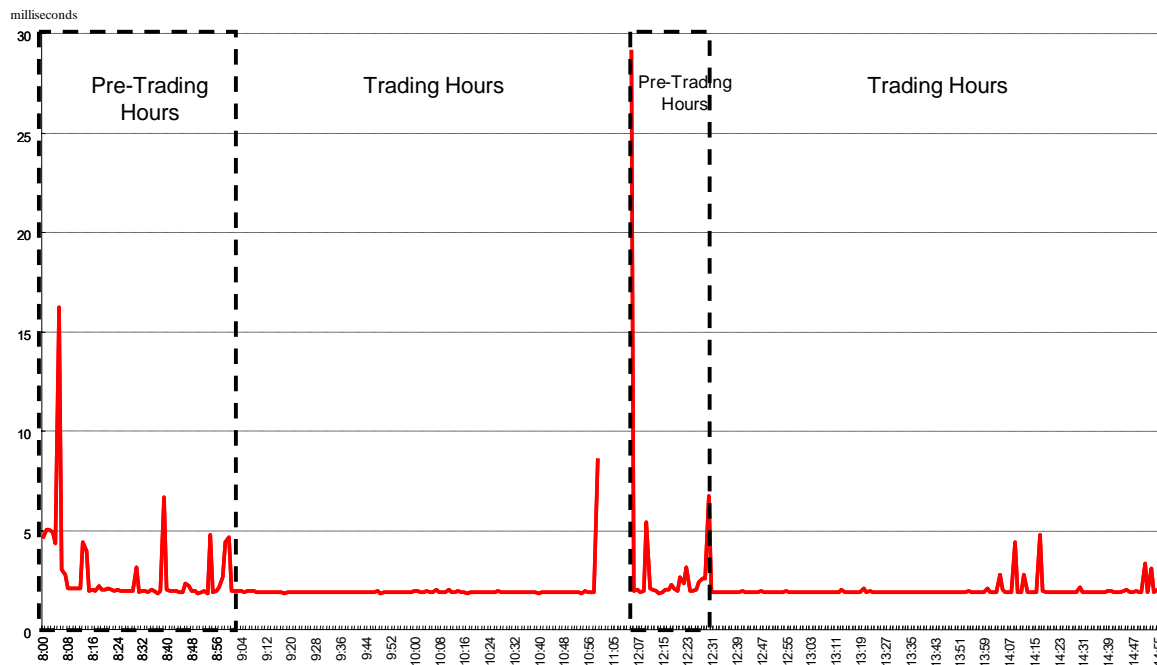
Latency Target

① Order response time: 5 ms

② Market Data latency: 3 ms



Change in Order Acceptance Response by Time (Jan. 6)



- Generally stable at 2ms throughout Zaraba trading, well below the target of 5ms.
- Order Acceptance Response is stable at a certain level almost throughout the day.

I-2. Capabilities

Higher Capacity

More than **45** million orders per day
(double that of the previous system)

Greater Scalability

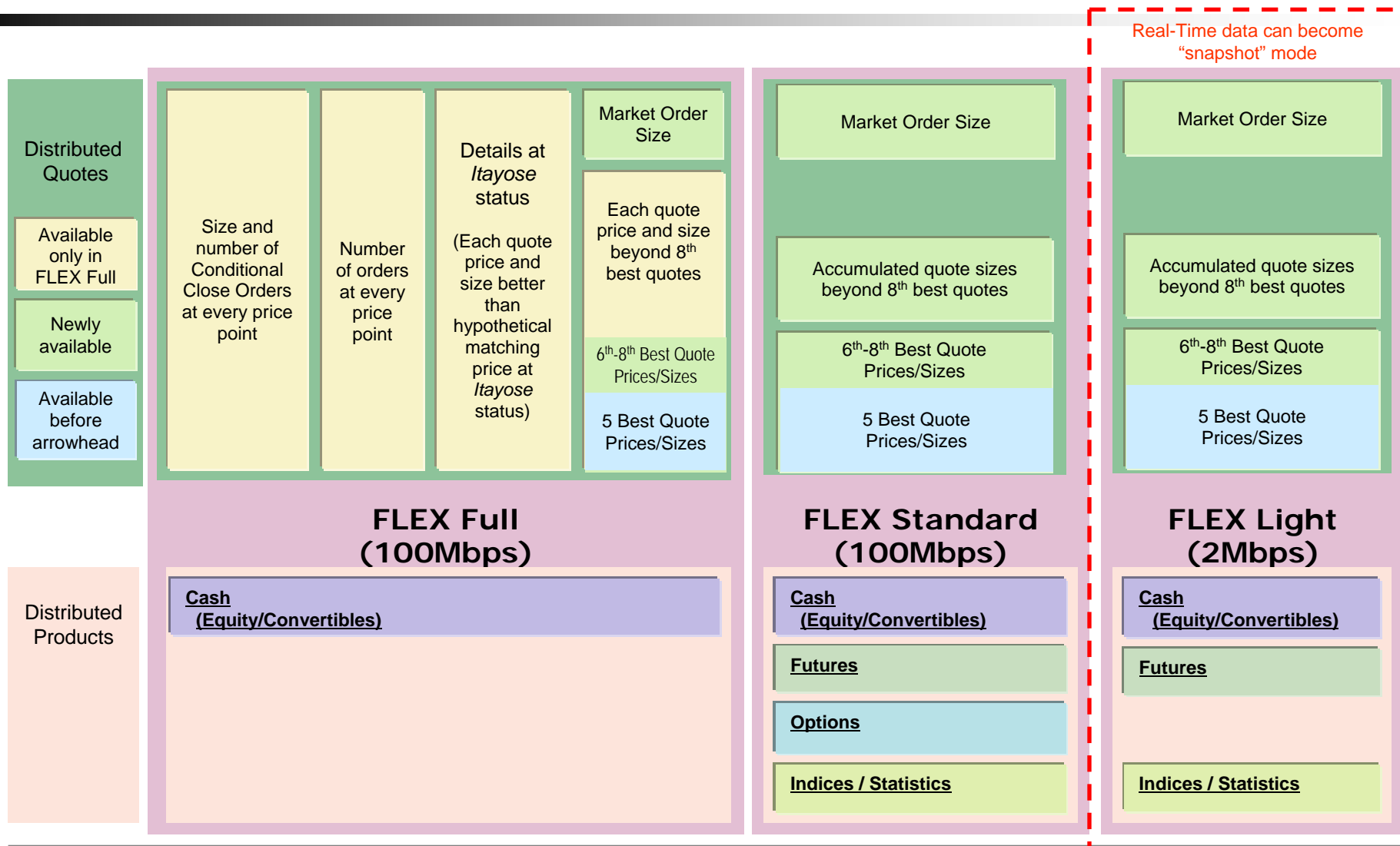
Increase capacity within **1** week

Robustness

1 active and **2** hot stand-by engines both
at Primary and Secondary Site

TSE Market Data Services after Launch of arrowhead

II-1. Service Lineup



II-2. Increase of Data Volume

Figure 1

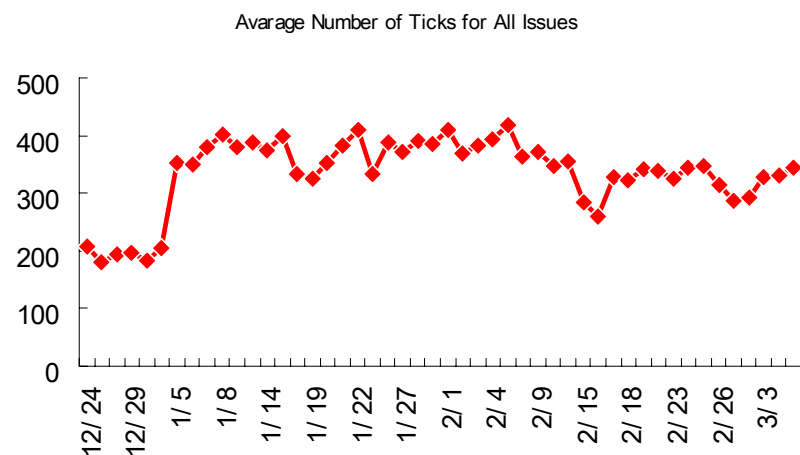
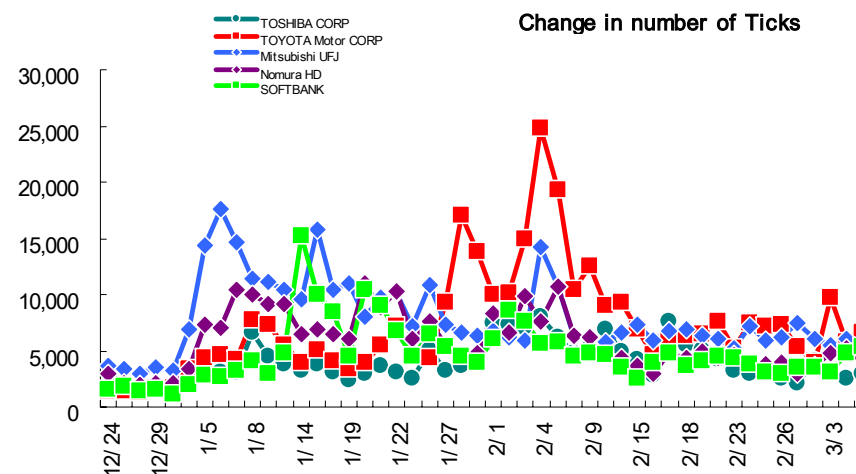


Figure 2



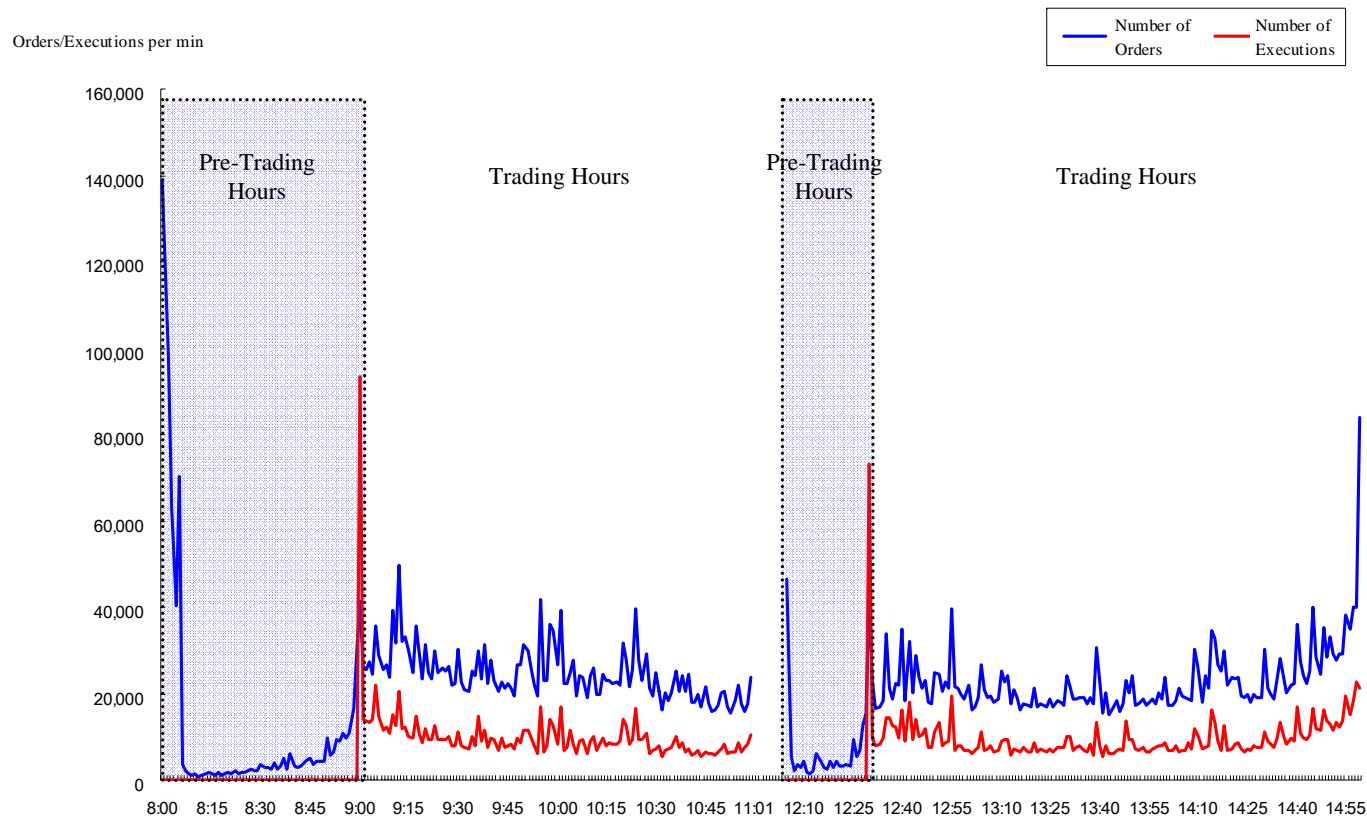
Matching interval becomes real-time after launch of arrowhead (previously every 3 sec)

- Figure 1: The average number of ticks for overall issues has approximately doubled.
- Figure 2: High liquidity issues shows drastic increase of the number of ticks.

(The number of ticks is the measure of the number of executions with or without changes in execution prices)

II-2. Increase of Data Volume

Change in Order and Execution Numbers by Time (Jan. 6)

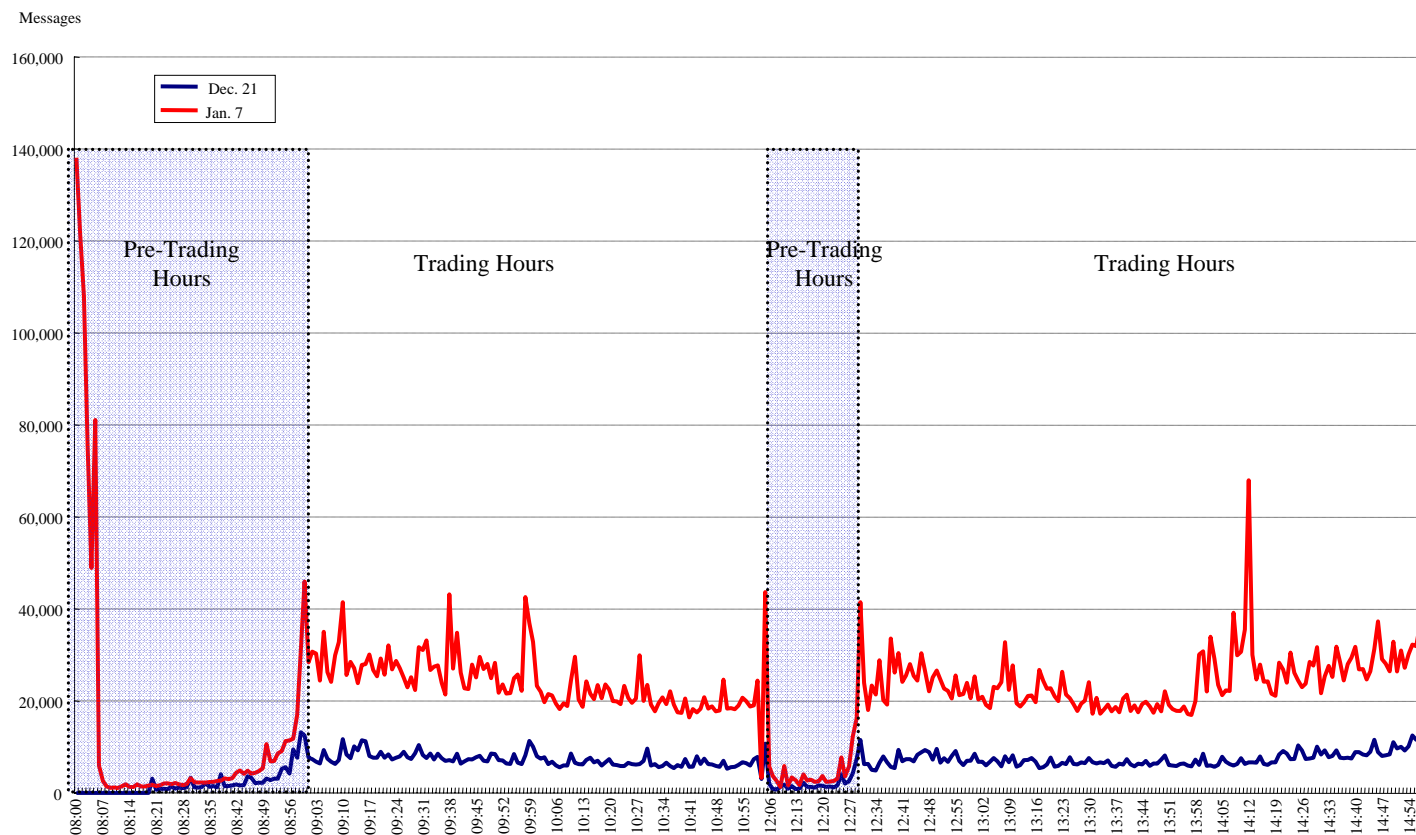


■ The peak of orders is seen just before the closing of the afternoon session

■ The peak of executions is seen at the opening of the session.

II-2. Increase of Data Volume

Information Distribution Amount Before and After Launch of arrowhead



- Daily Total Number of Message Output for December 12, 2009 ... 2,168,495 messages
- Daily Total Number of Message Output for January 7, 2009 ... 7,623,488 messages
- Daily information distribution amount has increased drastically, increasing the value of the data usage.

Changes of Market Data Policies and Administrative Issues

III-1. Introduction of “End-User License”

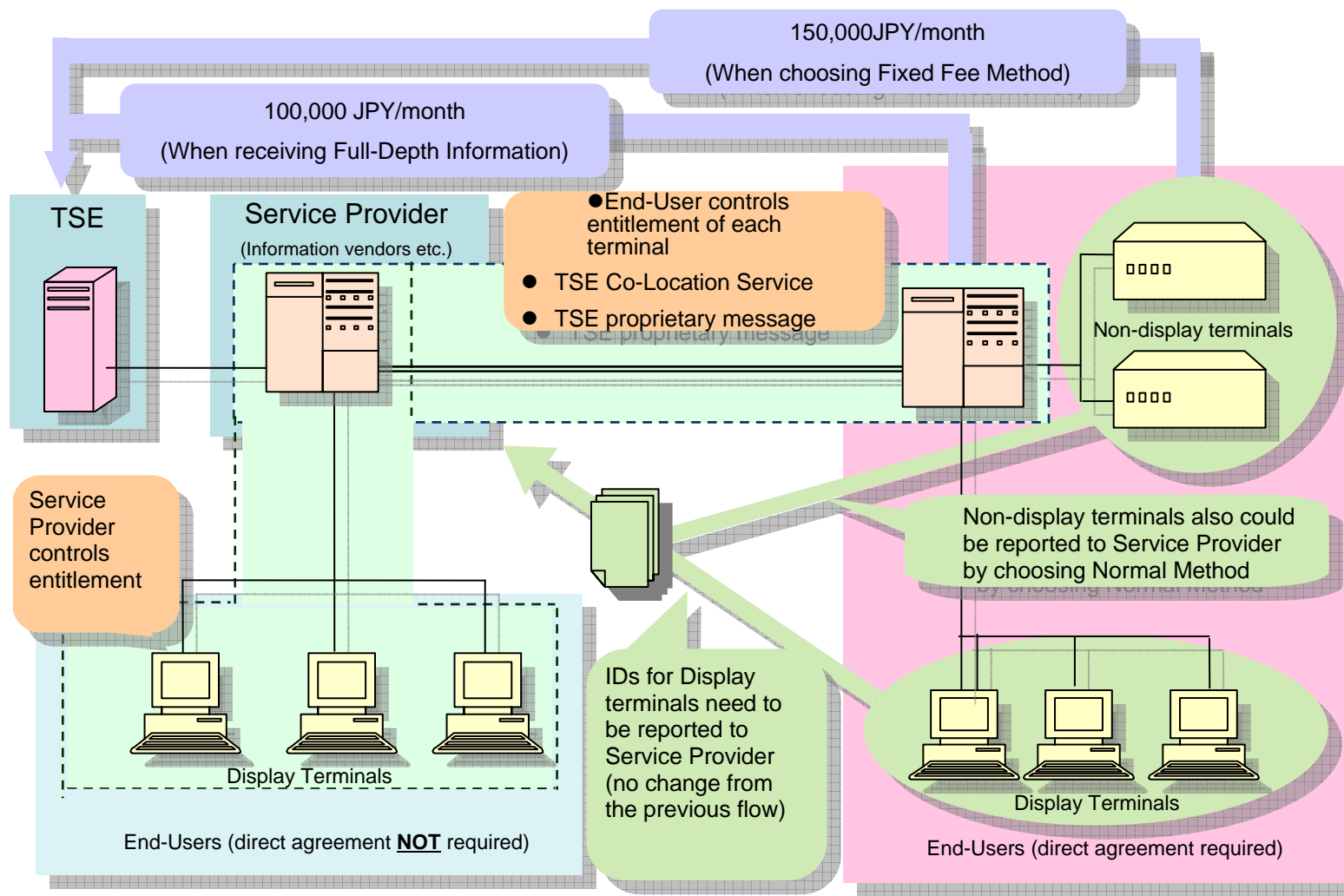
- Those who receives TSE data indirectly from information vendors etc. and use it internally (“End-Users”) have not been required direct agreement with TSE.
- After arrowhead launch, End-Users who fall under the following conditions have been required to execute direct agreement with TSE as “Licensed End User”.
 - I. When Service Provider does not technologically control the total number of the End-User’s access right to Real-Time Information. (e.g. using information vendor’s “datafeed”)
 - II. When the End-User receives Real-Time Information in the TSE Co-Location Service facility
 - III. When the End-User receives TSE data in a manner equivalent to direct connection to TSE system (e.g. in the case that the End-User receives Real-Time Information with TSE proprietary message format)
- Such End-Users can use TSE data much more flexible than traditional terminal users, and are expected to be well aware of TSE policies (including reporting policies) by entering direct agreement with TSE.
- Licensed End-Users are charged 100,000 JPY per month from TSE when receiving Full-Depth Information.

III-1. Introduction of “End-User License”

- Licensed End-Users can choose “Fixed Fee Method” as a new reporting method for non-display terminals.
 - No need for counting the number of non-display terminals, which is not necessary easy to “count”
 - Conventional way of reporting (count and report the number of non-display terminals along with display terminals) can be also selected. (“Normal Method”)

Reporting Method for Non-Display Terminals
<u>Normal Method</u> Number of non-display terminals is reported to Service Provider along with the number of display terminals. Service Provider reports the number to TSE.
<u>Fixed Fee Method</u> No need to count and report the number of non-display terminals but instead pay 150,000 JPY per month directly to TSE.

III-1. Introduction of “End-User License”



III-2. Launch of MICS

- Newly introduced **Market Information Client System (MICS)** is web-based contract administration system
- Procedures can complete electronically via Internet with normal web browser
- Both Japanese and English versions are available



Market Information Client System (MICS)

New Client Registration

- Registered ID must be at least 8 characters including at least 1 figure.
- Your temporary password will be sent to the registered e-mail address. Please register your preferred password after logging in with the temporary password.

* is required item

ID to be registered* (minimum 8 characters including at least 1 figure)	<input type="text"/>
E-mail address*	<input type="text"/>
<input type="button" value="Send"/>	

[Back to Log-in page](#)

Thank you

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