Update on Cash Market Development

20 March 2014
Cash Trading, Global Markets Division
In-Flight Projects Timeline

Note: All dates illustrated above are tentative for indication only. Confirmed dates will be issued by circular.

“MR” = Market Rehearsal

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Orion Central Gateway (OCG)

http://www.hkex.com.hk/OCG
Securities Market Platform Migration

**Current**
- AMS/3.8
- MDS/3.8 (retiring)
- HKEx Orion Market Data
- Open Gateway

**Transition**
- AMS/3.8
- HKEx Orion Market Data
- Open Gateway
- HKEx Orion Central Gateway

**Target**
- HKEx Orion Trading Platform
- HKEx Orion Central Gateway

*Phased approach to minimize participant impact*

*Market Data transition completed*

*Market Access Gateway transition*

*Orion Trading Platform launch*
Gateway Architecture

Today’s Open Gateway (OG) Architecture

- EP Office
  - BSS
  - OG
  - SDNet/2
  - Hosting Centre
    - AMS
    - BSS
    - OG

Future Orion Central Gateway (OCG) Architecture

- EP Office
  - BSS
  - OG
  - SDNet/2
  - Hosting Centre
    - OCG
    - AMS
    - BSS

- Access via OG Connection
- Gateway device in EP office, maintained by EP
- One pair of SDNet/2 circuits per OG

- Access via “OCG Session”
- Gateway device in HKEx, maintained by HKEx
- One pair of SDNet/2 circuits per location
## Comparison of OG and OCG

<table>
<thead>
<tr>
<th>Key Feature</th>
<th>OG</th>
<th>OCG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware</strong></td>
<td>By EP</td>
<td>By HKEx</td>
</tr>
<tr>
<td><strong>Resilience</strong></td>
<td>High Availability (HA) requires HA OG</td>
<td>HA and DR resilience built in</td>
</tr>
<tr>
<td></td>
<td>Disaster Recovery (DR) requires Backup OG</td>
<td></td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>AMS/3 open message protocol</td>
<td>FIX or Binary protocol</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>Max 60 Throttles (Trading)</td>
<td>Max 250 Throttles per OCG</td>
</tr>
<tr>
<td></td>
<td>Max 30 Throttles (Market Making)</td>
<td>Session</td>
</tr>
<tr>
<td><strong>SDNet Circuit</strong></td>
<td>Separate circuit for each OG</td>
<td>Circuits consolidation for each location</td>
</tr>
<tr>
<td><strong>Market Data</strong></td>
<td>Via OG</td>
<td>Via Orion Market Data Platform</td>
</tr>
<tr>
<td><strong>Trade Data</strong></td>
<td>Central Trade Feed (CTF)</td>
<td>Drop Copy Service*</td>
</tr>
</tbody>
</table>

* Real-time consolidated trade-only / order and trade reporting
OCG Benefits to EP

Cost Savings

- Eliminate OCG hardware
- Support SDNet circuit consolidation
- Eliminate monthly Backup Throttle charges

New Functionality

- Support FIX and Binary protocol compatible with future Orion Trading Platform
- Introduce Drop Copy service
- Introduce Cancel on Disconnect

Reliability & Efficiency

- Provide HA and DR to all OCG users
- Faster onboarding time for new OCG Session
- Low latency
- Decouple Trading and Market Data to reduce duplication and bandwidth
- High Capacity Session supports throttle consolidation for better utilization
- One Standard Throttle permits 2 Messages per second
# Change in Throttling Mechanism

<table>
<thead>
<tr>
<th>OG</th>
<th>OCG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Throttle Entitlement</strong></td>
<td></td>
</tr>
<tr>
<td>Standard Throttle (max 60 per OG)</td>
<td>Standard Throttle (max 250 per OCG Session)</td>
</tr>
<tr>
<td><strong>Throttling Mechanism</strong></td>
<td></td>
</tr>
<tr>
<td>2 channels: Orders and other messages</td>
<td>Single channel: Messages (Same treatment for Orders and other messages)</td>
</tr>
<tr>
<td><strong>1 Standard Throttle</strong></td>
<td></td>
</tr>
<tr>
<td>1 Order per second + other messages</td>
<td>2 Messages per second</td>
</tr>
</tbody>
</table>

- **Simplified throttling mechanism**
- **Additional Order throughput (up to 2 Orders/second per throttle) and flexibility for EPs**
OCG Status Updates

**OCG Upcoming Activities**

**Batch 1 Activity**
- Connectivity Tests: Mar 2014
- Rollout Tests: Apr 2014
- OCG Launch for Batch 1: Q2 2014

**Batch 2 Activity**
- Batch 2 Enrollment: 28 Mar 2014
- Revised OCG Specification: 28 Mar 2014
- Batch 2 Simulator Test: Apr to May 2014
- Test line installation: Apr to May 2014
- Batch 2 End-to-End Test: Jun to Jul 2014
- Production line installation: Jun to Jul 2014
- Batch 2 Rollout Test: Q3 2014
- Batch 2 Rollout: Q3 2014

**Project Manager’s Report**

- Project on schedule to launch in June.
- EPs can rollout new OCG session after Batch 1 if the BSS version has already completed End-to-End Test in Batch 1.
- Enhancement for semi-automatic matching (Odd Lot and Special Lot) is planned for rollout in Q3 2014 along with Batch 2 rollout.
- The new messages for semi-automatic matching are optional. Batch 1 EPs are required to perform End-to-End Test and Rollout Test in Batch 2 only if they plan to use these messages.

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MWS and Terminal Replacement

New Securities Trading Device (NSTD)

http://www.hkex.com.hk/NSTD
History

1986
Computer assisted terminal

1993
On-Floor “First Terminals”

1995
Off-Floor “Second Terminals”

2000
“Broker Supplied System” (BSS) Through Open Gateway (OG)

2000
“Multi-Workstation System” (MWS) Through Open Gateway (OG)
### Why Do This Project?

**We cannot do nothing…**

| Archaic Design and Architecture | Terminals date back to 1993, and MWS to 2000, and have not changed |
| Obsolescence                     | The MWS servers and the Windows 2003 operating system reach “end of support” in 2015 |
| Future Compatibility            | Terminals / MWS need to connect to the Orion Central Gateway (OCG) to be compatible with Orion Trading Platform (OTP) |

*We fundamentally believe that the terminal market is better served by vendors, and that HKEx should not participate in this space*

### The plan…

<table>
<thead>
<tr>
<th>Approach</th>
<th>Adopt an outsource model with an Independent Software Vendor for a 5 year term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrangement</td>
<td><em>ET Trade</em> (交易通) <em>(with group company ET Net)</em> will provide the new trading device “ET Trade Speed Station” and support services to EPs at a fixed price</td>
</tr>
<tr>
<td></td>
<td>HKEx will manage the migration with ET Trade for EP</td>
</tr>
<tr>
<td></td>
<td>HKEx will monitor the software and service quality of the vendor</td>
</tr>
<tr>
<td>Long Term</td>
<td>After 5 years, if the solution is proven, HKEx will step back</td>
</tr>
</tbody>
</table>
Key Features of ET Trade Speed Station

- Support HKEx customized keyboard and similar input sequence
- Same look and feel
- Compatible with existing devices
- New functions
Key Features of ET Trade Speed Station

- Support HKEx
- Customized keyboard and input sequence
- Provides 'MWS-like' screen
- Compatible with existing devices
- Multiple windows
- All in One screen
- Real-time charts
- New functions
- Options
Project Manager’s Report

HKEx appointed an Independent Software Vendor (ET Trade) to provide a new securities trading device - “ET Trade Speed Station”.

Most of the existing “look-and-feel” will be preserved, while introducing some new improved features (e.g. real-time charts, multiple screens). Development is in progress.

Migration to ET Trade Speed Station is optional, EP can choose to migrate to other BSS solutions or de-install existing MWS/Terminal.

Project on schedule to launch in late Q3.

NSTD Activities

<table>
<thead>
<tr>
<th>EP related Activity</th>
<th>Date</th>
<th>Project Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP General Briefings</td>
<td>Nov 2013</td>
<td>✔</td>
</tr>
<tr>
<td>NSTD Web Corner</td>
<td>Dec 2013</td>
<td>✔</td>
</tr>
<tr>
<td>EP Briefings on Migration</td>
<td>Mar 2014</td>
<td>✔</td>
</tr>
<tr>
<td>Information Paper</td>
<td>Apr 2014</td>
<td></td>
</tr>
<tr>
<td>MWS Migration Confirmation</td>
<td>Apr to May 2014</td>
<td></td>
</tr>
<tr>
<td>Contract signing with ET Trade</td>
<td>May to Jun 2014</td>
<td></td>
</tr>
<tr>
<td>SDNet reconfiguration</td>
<td>July to Aug 2014</td>
<td></td>
</tr>
<tr>
<td>User Training</td>
<td>(1 month before)</td>
<td></td>
</tr>
<tr>
<td>MWS Migration (by batch)</td>
<td>Q3 2014 to Q1 2015</td>
<td></td>
</tr>
<tr>
<td>MWS Termination</td>
<td>Q1 2015</td>
<td></td>
</tr>
<tr>
<td>Terminal Migration Enrollment</td>
<td>Sep to Oct 2014</td>
<td></td>
</tr>
<tr>
<td>Terminal Migration (by batch)</td>
<td>Q1 to Q2 2015</td>
<td></td>
</tr>
<tr>
<td>Terminal Termination</td>
<td>Q3 2015</td>
<td></td>
</tr>
</tbody>
</table>

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Thank You

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