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**MARKET DATA SOLUTIONS ON  
HKATS/DCASS UPGRADE**

**HKEX**  
香港交易所

HKEX-IS

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# AGENDA

1

HKEX Orion Market Data Platform – Derivatives Market Derivatives Lite Feed (“OMD D-Lite”) - Overview

2

Market Data Solutions to EPs on NG Decommissioning

3

On-Boarding Arrangement for OMD D-Lite

4

Testing Facilities

5

Notes for Software Developers

6

Appendices



# OMD D-LITE – OVERVIEW

1. OMD D-Lite comprises the following 2 feeds, both with update interval of one second:
  - Price Depth Feed provides updates on the 5 best bid/ask
  - Order Feed provides snapshots of all outstanding orders of spot month and next month contracts of HSI Futures, Mini-HSI Futures, H-share Index Futures and Mini H-share Index Futures (Collectively “Order Feed Series”) which are eligible for Volatility Control Mechanism (VCM) in the Derivatives Market
2. OMD D-Lite subscribers can also opt to subscribe to the existing OMD-D Trade Feed (Trade Feed) to obtain trade information without extra fee
3. The approximate bandwidth requirements for the above feeds are presented in the table below. OMD D-Lite subscribers can select the feeds as they require

Feed	Price Depth Feed		Order Feed	Trade Feed	
Product	Non SOM	SOM <sup>1</sup>	-	Non SOM	SOM
Bandwidth (Mbps)	6	8	3	2	1

4. OMD D-Lite is offered to EPs for internal use and redistribution to trading clients. EPs will need to sign a Market Data Vendor Licence Agreement for redistributing the data, and a Market Data End-user Licence Agreement if it is for internal use only.



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1

HKEX Orion Market Data Platform – Derivatives Market Derivatives Lite Feed (“OMD D-Lite”) - Overview

2

Market Data Solutions to EPs on NG Decommissioning

3

On-Boarding Arrangement for OMD D-Lite

4

Testing Facilities

5

Notes for Software Developers

6

Appendices



# MARKET DATA SOLUTIONS TO EPs ON NG DECOMMISSIONING

## 1. Introduction of New Datafeed

### CURRENT

#### HKATS OAPI

Usage	Internal + Trading clients	
Content	<ul style="list-style-type: none"> <li>- Price depth: 5 best bid/ask</li> <li>- Order info: MQ7</li> <li>- Trade info</li> </ul>	
Update Interval	2 updates per second	
Monthly Fee	\$1,750 per connection	
Bandwidth (Mbps)	<b>Market Data</b>	<b>Order Transaction</b>
	7	3

### NEW

#### OMD D-Lite

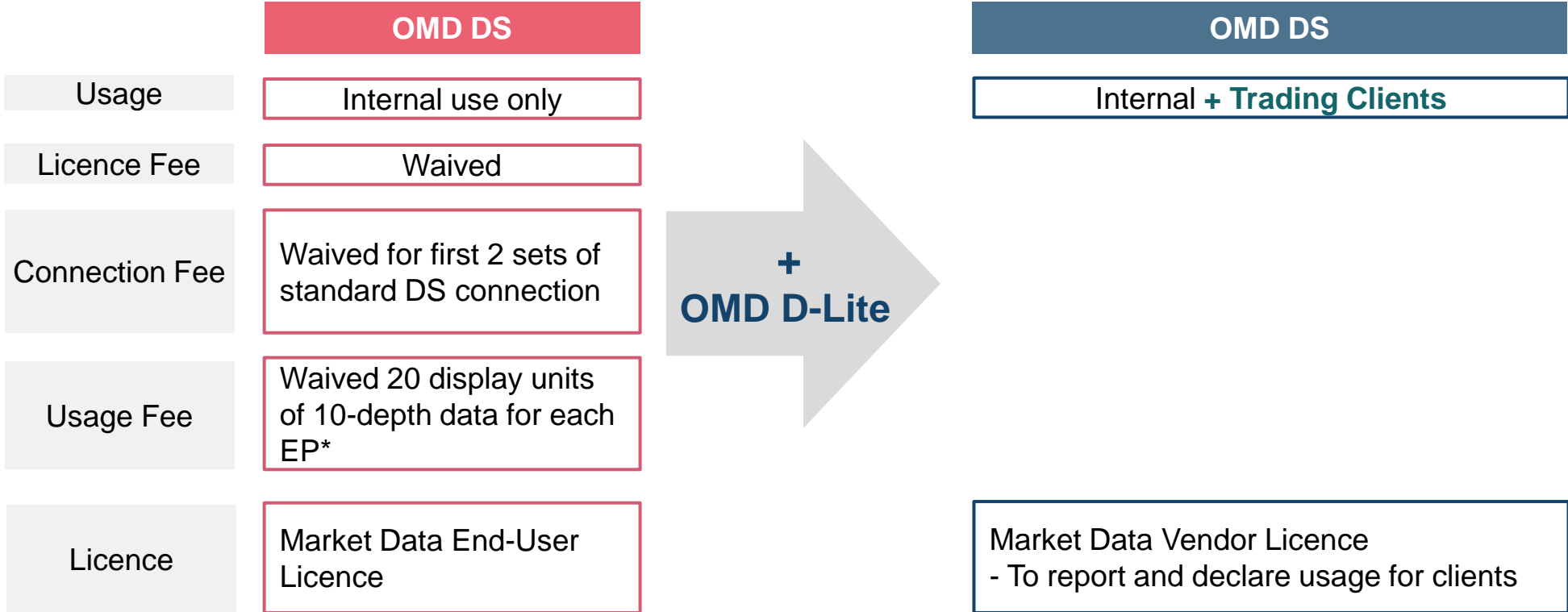
Internal + Trading Clients				
<ul style="list-style-type: none"> <li>- Price depth: 5 best bid/ask</li> <li>- Order info: Order Feed<sup>1</sup></li> <li>- Trade: Trade Feed (complimentary)</li> </ul>				
1 update per second				
\$2,000 per month (flat fee) <i>(Subject to approval)</i>				
<b>Non-SOM</b>		<b>SOM<sup>2</sup></b>		Order
Price	Trade <sup>3</sup>	Price	Trade <sup>3</sup>	
6	2	8	1	3



Note : 1. Contains only Order Feed Series which are eligible for Volatility Control Mechanism (VCM) in the Derivatives Market  
 2. SOM refers to Stock Options Market  
 3. The bandwidth for Non-SOM plus SOM is 2 Mbps

# MARKET DATA SOLUTIONS TO EPs ON NG DECOMMISSIONING

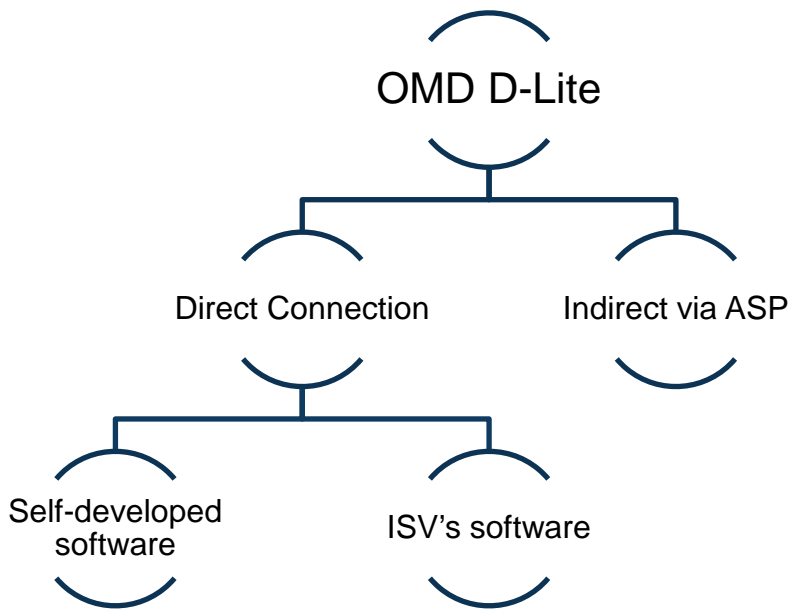
## 2. Special Arrangement on OMD Derivatives Standard



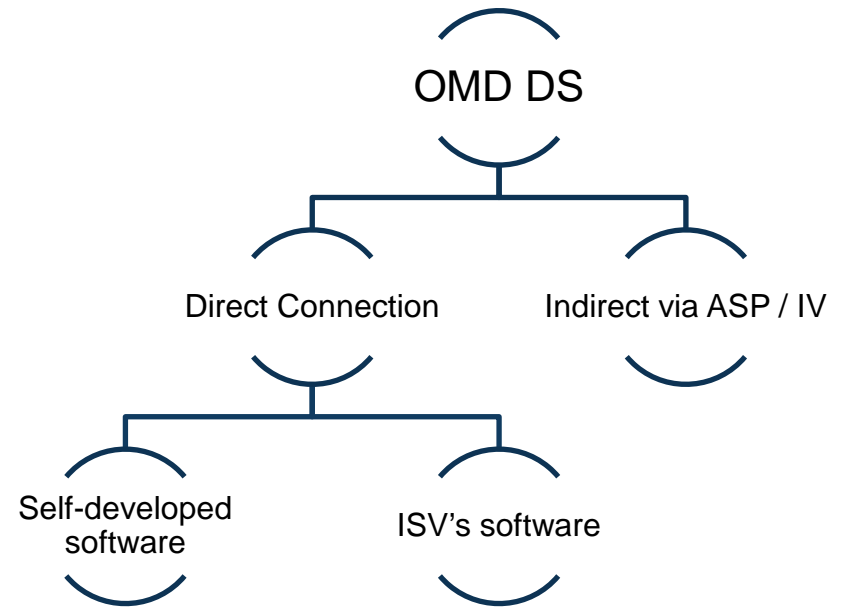
Note \* - Free display units can also be consumed via subscribing market data services from HKEX licensed information vendors

# MARKET DATA SOLUTIONS TO EPs ON NG DECOMMISSIONING

## 3. Connectivity and Software



- **Licence:** Vendor Licence for redistribution and End-User Licence for internal use
- **Usage reporting:** As required

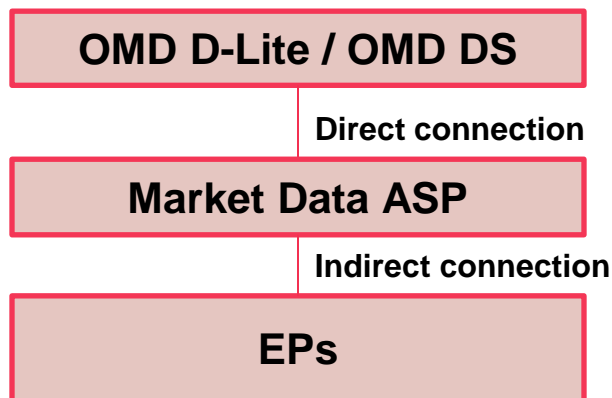


- **Licence:** Vendor Licence for redistribution and End-User Licence for internal use
- **Usage reporting:** On a monthly basis



# MARKET DATA SOLUTIONS TO EPs ON NG DECOMMISSIONING

## 4. Solution to EPs using Application Service Providers



**Agreement:** Market Data Application Service Provider Licence

**One-off Connection Fee:** \$10,000, waived for companies who are already Market Data ASPs for OMD DS, OMD DP or OMD DF

**Monthly Fee:** \$2,000 for OMD D-Lite

Names of the ASP licensees and applicants will be published on website <http://www.hkex.com.hk/eng/prod/dataproduct/la/Licences.htm> for EPs' easy reference.

# AGENDA

1

HKEX Orion Market Data Platform – Derivatives Market Derivatives Lite Feed (“OMD D-Lite”) - Overview

2

Market Data Solutions to EPs on NG Decommissioning

3

On-Boarding Arrangement for OMD D-Lite

4

Testing Facilities

5

Notes for Software Developers

6

Appendices



# ON-BOARDING ARRANGEMENT FOR OMD D-LITE

## 1. Connectivity

1. OMD D-Lite subscribers can gain access to OMD D-Lite using either of the following approaches
  - Direct Connection      Installation of production lines to directly access OMD D-Lite
  - Indirect Connection      Indirect access to OMD D-Lite Data through a licensed Application Service Provider of HKEX-IS (“ASP”)
2. Unlike other OMD-D datafeed products, OMD D-Lite is not accessible through an Information Vendor (IV) who is not an ASP because OMD D-Lite is offered to EPs only.



# ON-BOARDING ARRANGEMENT FOR OMD D-LITE

## 2. Software Readiness Approach

### Indirect connection OMD D-Lite subscribers

will use ASP's solution for processing data disseminated from OMD D-Lite

### Direct connection OMD D-Lite subscribers

will have 2 choices:

- use software provided by an Independent Software Vendor (ISV) who is recognised by HKEX-IS as an ISV
- develop its own software to process OMD D-Lite data and meet the testing requirements as required by HKEX-IS

Names of the certified ISVs and applicants will be published on website <http://www.hkex.com.hk/eng/prod/dataprod/isv/isv.htm> for EPs' easy reference.



# ON-BOARDING ARRANGEMENT FOR OMD D-LITE

## 3. Technical Features – Highlight

### OMD D-Lite has similar features as other datafeed products of OMD-D

	Components		
	Real-time Channels	Refresh (RFS)	Retransmission (RTS)
Purpose	<b><u>Real-time Transmission</u></b> Provide snapshot updates of market information	<b><u>Data Recovery:</u></b> Enable user to retrieve the latest market image	<b><u>Data Recovery</u></b> Enable user to recover lost data by specifying the data segment
Update Interval	5 best bid/ask: 1 second <sup>1</sup>	Set for bandwidth requirement <sup>1, 2</sup>	N/A
Transmission Protocol	Multicast		TCP/IP Unicast
Access Control	Network setting by network provider		Network setting and user logon: Each user will be assigned with a user ID for RTS logon
Resilience	Dual Node Processing enables line arbitration mechanism for data recovery		Dual Node Processing
Disaster Recovery (DR)	When failing over to the DR site, signals will be sent through a dedicated channel to indicate if a site failover is in process or has been completed		

HKEX-IS provides a comprehensive set of technical documents for OMD D-Lite, including (1) Interface Specification, (2) Developers Guide and (3) Connectivity Guide. Developers should read these documents carefully for handling the OMD D-Lite messages and making connections to the testing / production environments properly.



Note : 1. Please refer to Appendix for the update interval of other datafeed products  
 2. The setting of the update interval of refresh cycle aims to reduce the bandwidth consumption which has direct impact on the network cost of OMD D-Lite subscribers and it also takes into consideration the expected low usage of RFS during trading hours. The current setting is considerably higher than the other OMD-D datafeed products and is subject to review from time to time.

# ON-BOARDING ARRANGEMENT FOR OMD D-LITE

## 4. Software Testing Requirement

### Readiness Test for OMD D-Lite <sup>1</sup>

The following parties will be required to install or reconfigure testing line(s) with sufficient bandwidth to connect to the OMD D-Lite Readiness Test Environment to complete the Readiness Test:

- ASPs and ISVs who are going to offer OMD D-Lite solutions to EPs
- Direct connection OMD D-Lite subscribers who
  - will not use an ISV solution; and
  - will redistribute OMD D-Lite data to trading clients
- Other direct connection OMD D-Lite subscribers who need the OMD D-Lite Retransmission Service (RTS) to recover missing messages



# ON-BOARDING ARRANGEMENT FOR OMD D-LITE

## 5. Activities for Joining OMD D-Lite Rollout

M – Mandatory, O - Optional

	Submit enrolment / application form	Submit form for appointing ISV	Install testing lines	Complete Readiness Test	Declare software readiness	Return signed Licence Agreement	Install production lines	Join Market Rehearsal	Join Post Release Test
Parties concerned	By 31 Oct 17	By End 17	Q3 / Q4 17	Q1 18, at least 2 weeks before Market Rehearsal				Q1 18	Q2 18
ASP	M		M	M	M		M	M	M
ISV	M		M	M	M				
EPs using ASP solution	M					M			
EPs using ISV solution	M	M				M	M	O	O
EPs as vendors using self-developed software	M		M	M	M	M	M	M	M
EPs as end-users using self-developed software									
- Will use RTS	M		M	M	M	M	M	O	O
- Will not use RTS	M		O	O	M	M	M	O	O



# ON-BOARDING ARRANGEMENT FOR OMD D-LITE

## 6. Documents and Forms

Parties concerned	Licence			Important Documents and Forms						
	ASP Licence	Market Data Vendor Licence	Market Data End-user Licence	Enrolment / Application Form	ISV Acknowledgement	Declaration Form for using ISV	Connectivity Notification Form		Readiness Test Answer Book	Declaration of Software Readiness
							Testing	Production		
ASP	✓			✓			✓	✓	✓	✓
ISV					✓		✓		✓	✓
EP as vendor using ASP solution		✓		✓						
EP as end-user using ASP solution			✓	✓						
EP as vendor using ISV solution		✓		✓		✓		✓		
EP as end-user using ISV solution			✓	✓		✓		✓		
EP as vendor using self-developed software		✓		✓			✓	✓	✓	✓
EP as end-user using self-developed software										
- Will use RTS			✓	✓			✓	✓		✓
- Will not use RTS			✓	✓				✓		✓





# ON-BOARDING ARRANGEMENT FOR OMD D-LITE

## 7. Rollout Timeline

Actioned By		Action	Tentative Schedule
HKEX-IS	OMD D-Lite Subscribers		
	✓	Submit enrolment form	On or before 31 Oct 2017
✓		Provide Connectivity Guide	Early Q4 2017
	As needed	Complete installation or reconfiguration of testing lines <sup>1</sup>	Early Q4 2017
✓		Provide Testing Facilities <sup>2</sup>	Q4 2017
	As needed	Complete installation or reconfiguration of production lines <sup>1</sup>	Q1 2018
	As needed	Submit Declaration Form for Software Readiness	At least 2 weeks before MR
	✓	Return signed Licence Agreement	At least 2 weeks before MR
✓	As needed	Market Rehearsal (MR)	Q1 2018
		Rollout	Q2 2018



<sup>1</sup> - Subscriber should allow 2 to 4 weeks for the network provider to complete the line installation and configuration

<sup>2</sup> - Testing Facilities include Offline Simulator Tool, End-to-End Test Environment and Readiness Test Environment

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1

HKEX Orion Market Data Platform – Derivatives Market Derivatives Lite Feed (“OMD D-Lite”) - Overview

2

Market Data Solutions to EPs on NG Decommissioning

3

On-Boarding Arrangement for OMD D-Lite

4

Testing Facilities

5

Notes for Software Developers

6

Appendices



# TESTING FACILITIES

## 1. Overview

	Offline	On-Line Testing Environment	
	Offline Simulator Tool	End-to-End Test	Readiness Test
Highlights	<ul style="list-style-type: none"> <li>User installs the simulator into their own machine(s)</li> <li>User replays the canned data with the simulator</li> <li>Expected results are provided for user to verify the performance of their OMD D-Lite feed handling software</li> </ul>	<ul style="list-style-type: none"> <li>User performs loop test for order entry, trade confirmaton and refreshed market data</li> </ul>	<ul style="list-style-type: none"> <li>User participates in scheduled sessions to verify its OMD D-Lite feed handling software in various areas (see Test Scope)</li> <li>Answer Book is provided to facilitate user's verification</li> <li>Production data replay will be arranged at a later stage for user to experience production-like message behaviours</li> </ul>
Technical requiriements	<ul style="list-style-type: none"> <li>Machine on Linux OS</li> <li>User should read the Offline Simulator Tool User Guide for details</li> </ul>	Testing line(s) with sufficient bandwidth <sup>1</sup>	Testing line(s) with sufficient bandwidth <sup>1</sup>
Test scope	<ul style="list-style-type: none"> <li>Message decoding</li> <li>Line arbitration</li> <li>Using Refresh service</li> <li>Using Retransmission service (<i>needs 2 machines</i>)</li> <li>Volume / Stress test</li> </ul>	<ul style="list-style-type: none"> <li>Loop test only</li> </ul>	<ul style="list-style-type: none"> <li>Message decoding</li> <li>Line arbitration</li> <li>Using Refresh service</li> <li>Using Retransmission service</li> <li>Volume / Stress test</li> <li>Site failure and failover</li> </ul>

<sup>1</sup> - Users planning to access both testing environments using the same testing line(s) should make sure that the line bandwidth is sufficient for activities carried out in the two environments at the same time. Otherwise it may affect the test results.



# TESTING FACILITIES

## 2. Readiness Test Requirements and Benefits

Readiness Test Requirement	ASP	ISV	EPs using self-developed software	
			Vendor EP	End-user EP with RTS
Message Decoding	✓	✓	✓	
Line Arbitration	✓	✓	✓	
Using Refresh Service	✓	✓	✓	
Using Retransmission Service	✓	✓	✓	✓
Volume / Stress Test	✓	✓	✓	
Site Failure and Failover	✓	✓	✓	

### Benefits of Joining Readiness Test / Readiness Test Environment

- Thoroughly test the OMD D-Lite feed handling software and ensure its ability to
  - Decode all OMD D-Lite message correctly
  - Detect data loss and recover missing data properly and timely
  - Handle high volume of data
  - Respond and resume normal operation timely in case of failover of OMD D-Lite operation from its primary site to the secondary site
- Experience production-like message behaviour

# AGENDA

1

HKEX Orion Market Data Platform – Derivatives Market Derivatives Lite Feed (“OMD D-Lite”) - Overview

2

Market Data Solutions to EPs on NG Decommissioning

3

On-Boarding Arrangement for OMD D-Lite

4

Testing Facilities

5

Notes for Software Developers

6

Appendices



# NOTES FOR SOFTWARE DEVELOPERS (1)

## Developers having experience with Derivatives Standard (DS)

OMD D-Lite is the same as DS except in the following ways:

- It provides 5 best bid/ask information
- The order book is updated once a second
- The update interval of a refresh cycle is considerably higher than the other OMD-D datafeed products <sup>1</sup>
- It provides snapshot images of all outstanding orders of Order Feed Series by transmitting Add Order (330) messages in the following manners:
  - Add Order (330) messages under the Order Feed of OMD D-Lite will be transmitted in the same manner as a Refresh cycle and a Refresh Complete (203) message will be transmitted after the Add Order (330) message for the last outstanding order in one cycle
  - The interval between 2 cycles is about 1 second, and hence unlikely to receive heartbeats between 2 normal cycles
  - Refresh and Retransmission services are not applicable to Add Order (330) messages under the Order Feed of OMD D-Lite



Note : 1. The setting of the update interval of refresh cycle aims to reduce the bandwidth consumption which has direct impact on the network cost of OMD D-Lite subscribers and it also takes into consideration the expected low usage of RFS during trading hours. The setting is subject to review from time to time.

# NOTES FOR SOFTWARE DEVELOPERS (2)

## Possible Subsequent Changes for HKATS/DCASS Upgrade

### Scope of change

- New data fields introduced in HKATS/DCASS Upgrade that OMD-D datafeed products, including OMD D-Lite, need to accommodate
- Change of attributes and/or possible values of existing data fields
- Other changes, if any

### Schedule – follows HKATS/DCASS Upgrade Schedule (Tentatively)

Provision of Revised Interface Specification, <i>if any</i>	Sep 2017
Provision of Canned Data for Offline Simulator Tool	Q1 2018
Software Readiness by OMD D-Lite Subscribers/ASP/ISV	Q2 2018
Market Rehearsal	Early Q3 2018
Production Rollout	Late Q3 2018



## ENQUIRES

- For Business Arrangements: [MarketData@hkex.com.hk](mailto:MarketData@hkex.com.hk)
- For Technical Arrangements: [IVSupport@hkex.com.hk](mailto:IVSupport@hkex.com.hk)
- Client Notices <http://www.hkex.com.hk/eng/prod/dataproduct/2017notices.htm>





# AGENDA

1

HKEX Orion Market Data Platform – Derivatives Market Derivatives Lite Feed (“OMD D-Lite”) - Overview

2

Market Data Solutions to EPs on NG Decommissioning

3

On-Boarding Arrangement for OMD D-Lite

4

Testing Facilities

5

Notes for Software Developers

6

Appendix



# EXISTING OMD-D DATAFEED PRODUCTS

1. The current OMD-D offerings include the followings:

Feature	OMD-D Datafeed Product		
	Derivatives Standard (DS)	Derivatives Premium (DP)	Derivatives Full Book (DF)
Price depth	10 best bid/ask	10 best bid/ask + 11 <sup>th</sup> for remaining orders	Full order book
Updating interval	~ 0.25 second	Streaming	Streaming
Bandwidth (Mbps)	30	60	60
Subscription fee	Refer to the HKEX website at <a href="http://www.hkex.com.hk/eng/prod/dataproduct/la/prices/Fee_Schedule.htm">http://www.hkex.com.hk/eng/prod/dataproduct/la/prices/Fee_Schedule.htm</a>		

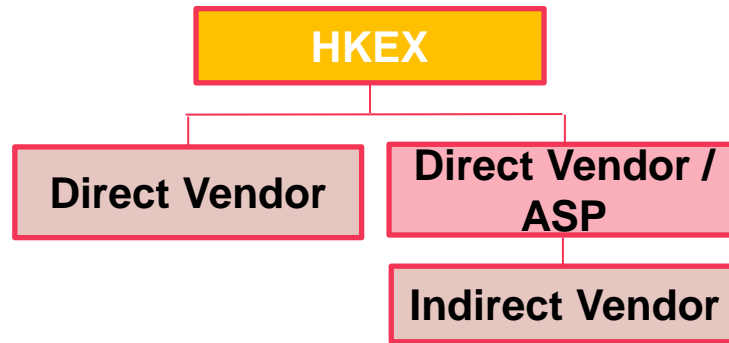
Note: The Price Depth Feed of the OMD-D Feed Package for EP is a replica of DS with different price depth and updating interval

2. EPs subscribing OMD-D DS directly from HKEX for internal use would enjoy fee waivers on the End-User Licence Fees and Connection Fee.



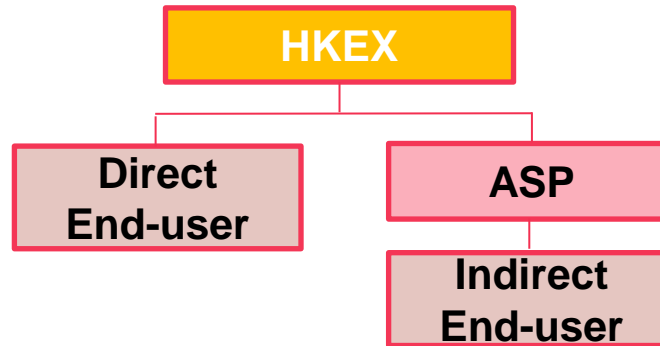
# TYPES OF MARKET DATA LICENCE

## Market Data Vendor Licence



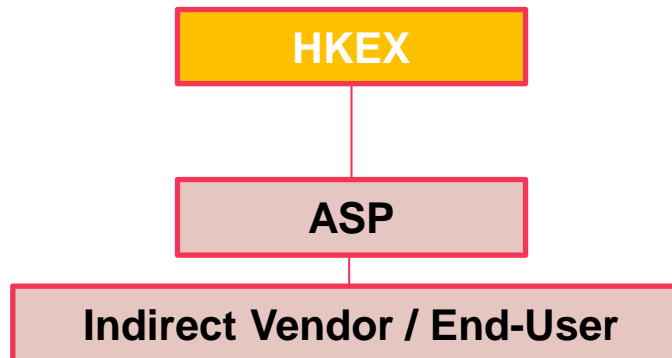
- **Purpose** : For company's external distribution
- **Means of Connection** : Direct or indirect

## End-User Licence



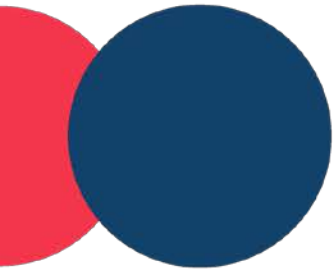
- **Purpose** : For company's internal use only
- **Means of Connection** : Direct to HKEX or via ASP

## ASP Licence



- **Purpose** : For company that would like to distribute data to clients but does not have responsibility on usage reporting and payment
- **Means of Connection** : Direct





# Questions and Answers