

Orion Market Data Updates

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1

OMD Overview

2

OMD-C Implementation and On-boarding updates

3

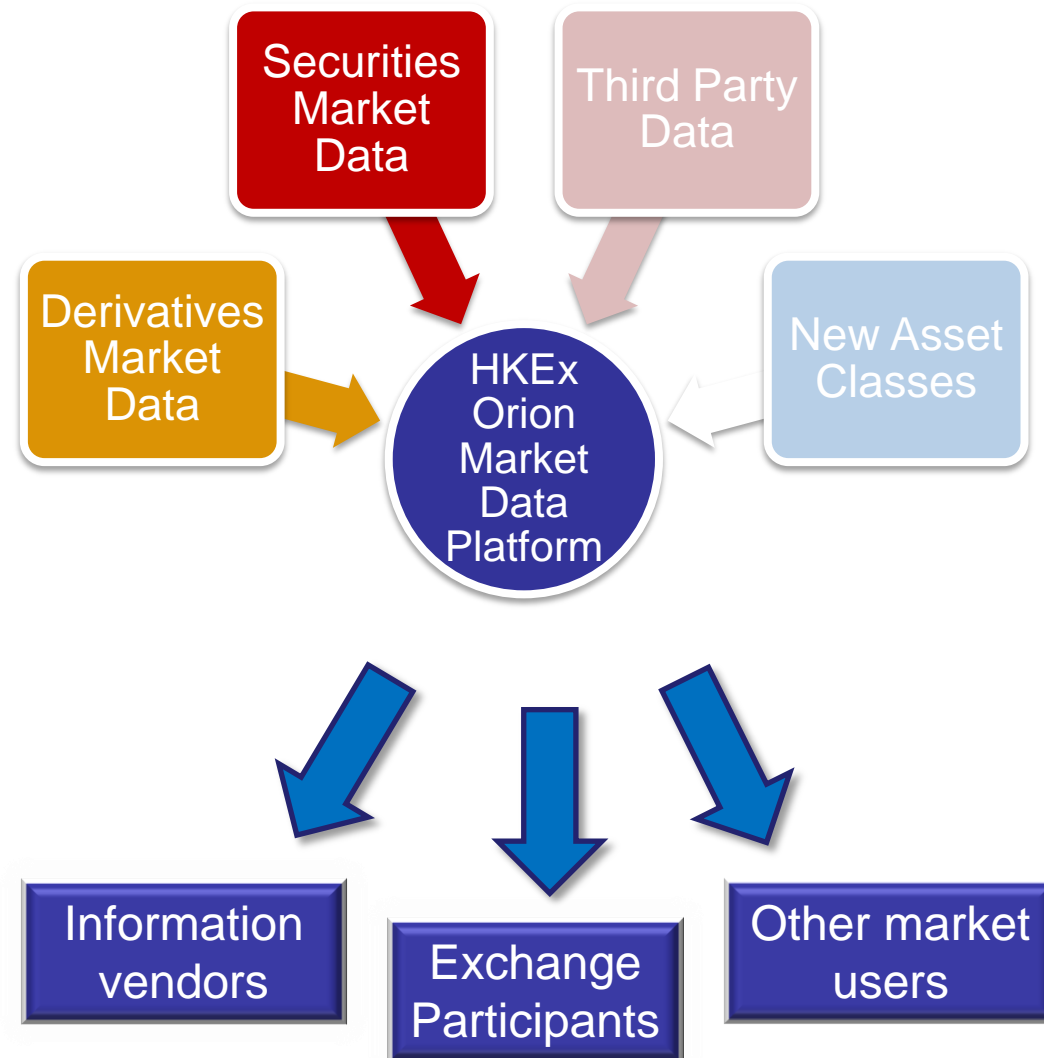
MMDH Implementation and On-boarding updates

4

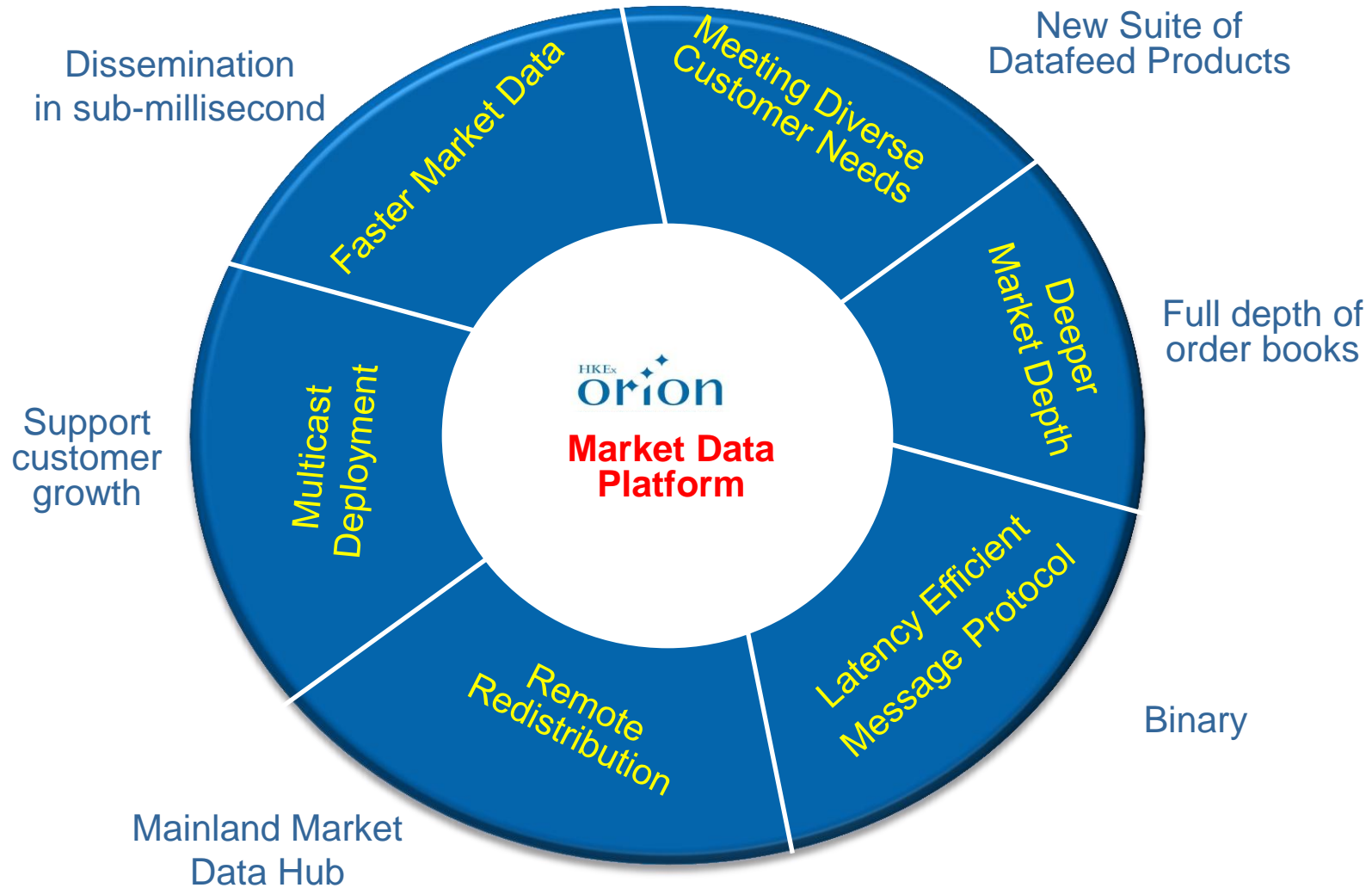
OMD – D Product Offerings

HKEx Orion Market Data Platform (OMD)

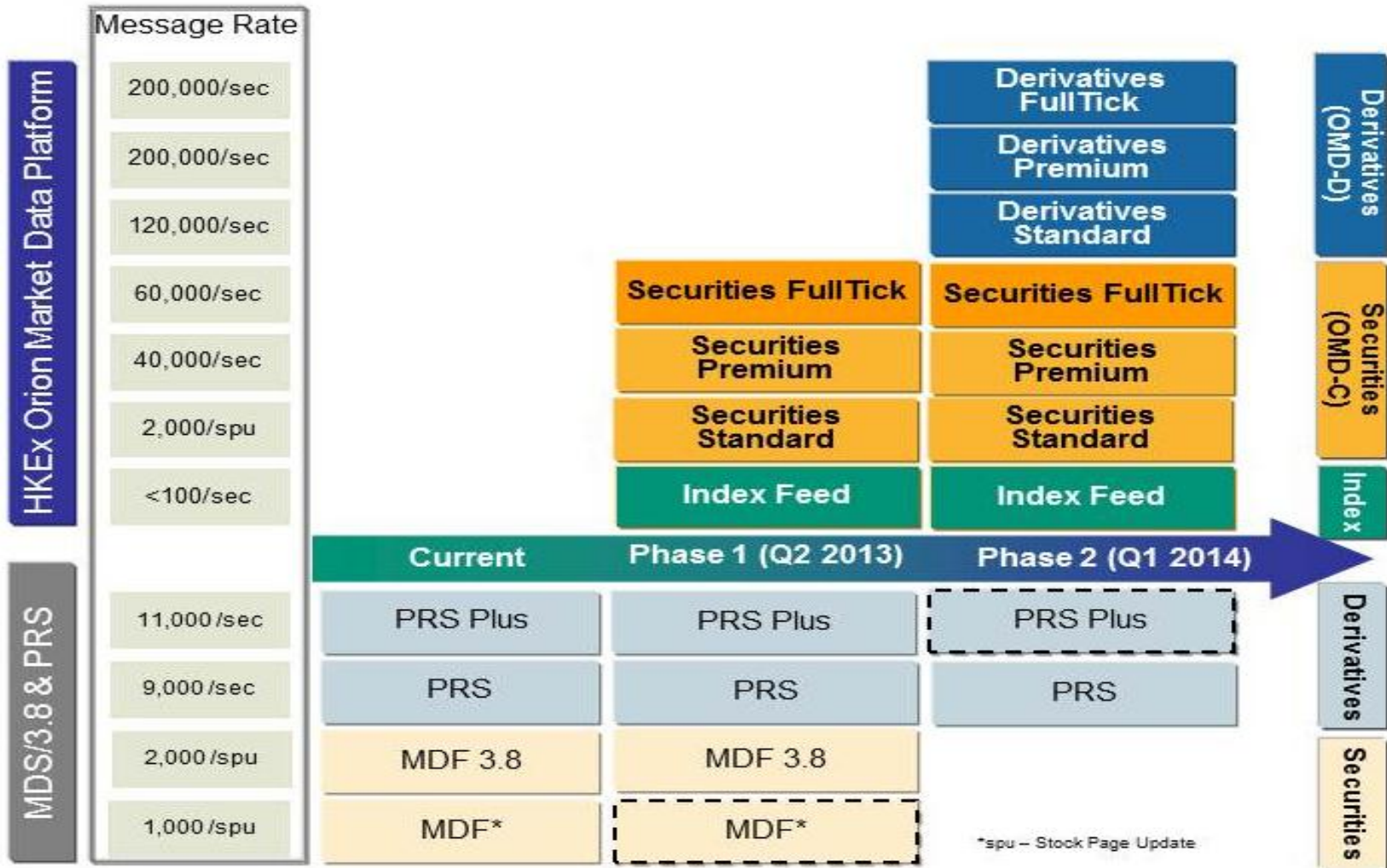
- Single, integrated platform
- Low-latency
- Multiple feeds
- Multiple asset classes
- Common message protocol



OMD Key Features



OMD Datafeed Product Road Map



OMD Project Progress Updates by Phases

- OMD project will be launched by phases, with a varieties of products serving different markets and target groups.
- Recap the OMD products suites by phases as below:

Securities Market (OMD-C)

- Securities Standard (SS)
- Securities Premium (SP)
- Securities FullTick (SF)

Optional:

- Index Feed (OMD-Index)
- Odd Lot Order (OLO)
- Conflated Broker Queue (CBQ)

OMD
Phase 1a

Mainland Market Data Hub (MMDH)

- Securities Standard (SS)

Optional:

- Index Feed (OMD-Index)
- Odd Lot Order (OLO)

OMD
Phase 1b

Derivatives Market (OMD-D)

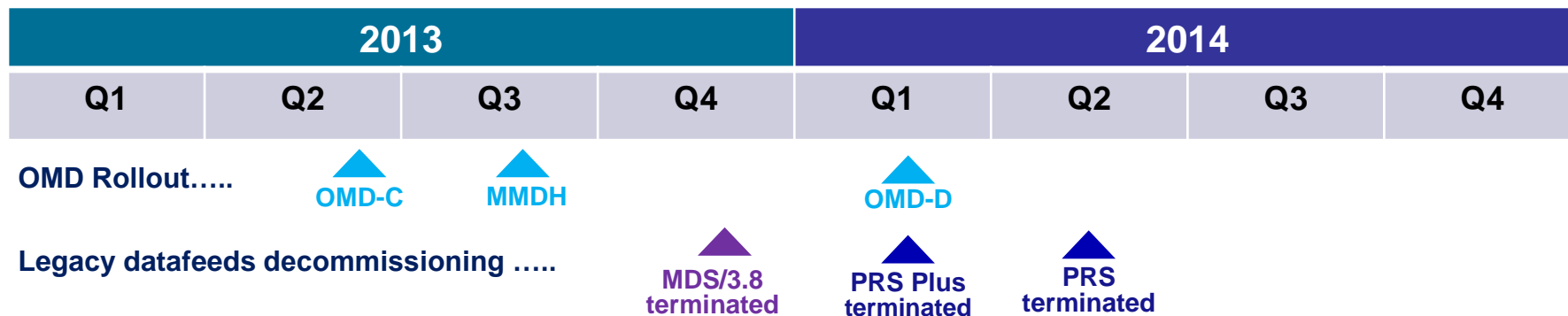
- Derivatives Standard (DS)
- Derivatives Premium (DP)
- Derivatives FullTick (DF)

Optional:

- Individual Trades (DT) – for DS clients only
- Index Feed (OMD-Index)

OMD
Phase 2

New Datafeeds Rollout & Legacy Feeds Decommissioning



Phase 1a – Securities Market (Q2 2013)

MDS/3.8 & MDF* Unicast Feeds

OMD-C Multicast Feeds

Phase 1b – Mainland Market Data Hub (Q3 2013)

MMDH – Securities & Index Unicast Feeds

Phase 2 – Derivatives (Q1 2014)

PRS & PRS-Plus Unicast Feeds

OMD-D Multicast Feeds

1

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2

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3

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4

OMD – D Product Offerings

OMD-C Products

- Product Positioning Emphasis



Securities Standard (“SS”)

- On par with OG & MDF3.8 datafeed in data contents and update rate

Securities Premium (“SP”)

- Low latency datafeed
- Comprehensive market information with statistics, news etc.
- Fit for automatic trading applications

Securities FullTick (“SF”)

- Low latency datafeed
- Provide full order information*
- Dissemination of individual orders and trades
- User can build order book and compile market statistics

* No order information is however available during auction session.

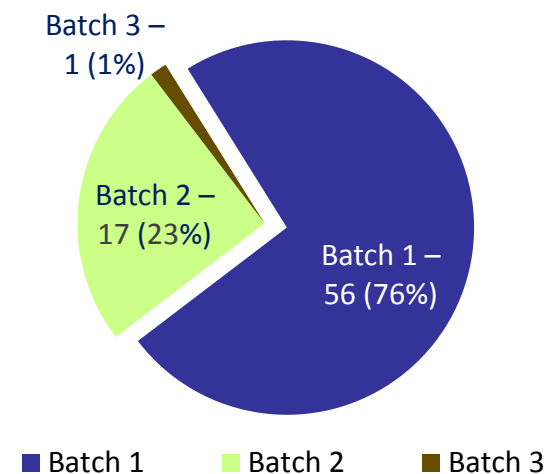
OMD-C Implementation - Enrollment Status

- Feed enrollment form submission as at 11 Mar 2013
 - 75 out of 80 direct connection IVs submitted
 - 20 out of 83 indirect connection IVs submitted

- Datafeeds enrollment status

Datafeed	Number of IVs		
	Direct Connection	Indirect Connection	Total
Securities Standard (SS)	37	16	53
Securities Premium (SP)	28	4	32
Securities FullTick (SF)	27	-	27
Index Feed	56	3	59

**Client Distribution
(direct connection)**



1

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2

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3

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4

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MMDH

- On-boarding Schedules & Activities



		'12	2013							
Action Items	Activities	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
On-boarding tools Testing	Dispatch of MMDH On boarding tools packages									
	Clients to develop their system and perform on-boarding tools testing									
MMDH Feed Enrolment	Clients to complete the Enrolment form.									
Testing Line Installation	Clients to install testing leased lines through local telcos									
Open Test	Clients to test their system in MMDH open test environment									
Certification Test	Clients to participate the certification test and declared their readiness									
Production Lines Installation	Clients to install leased lines for production									
Market Rehearsals	Client to participate and confirm results of the market rehearsals									
Post Release Test	Clients to participate and confirm results of the post release test									
Initial Rollout of MMDH	MMDH goes live after successful completion of post-release test									

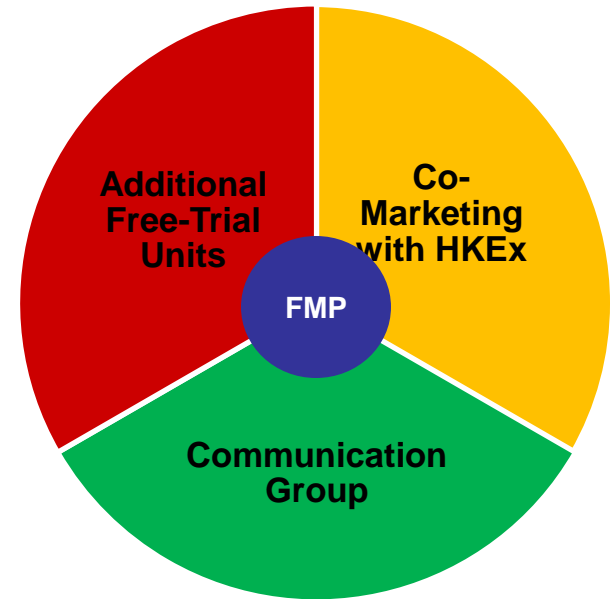
Mainland Market Data Hub (MMDH) Founding Member Program (FMP)



Mainland Market Data Hub (MMDH) is scheduled to launch in Aug 2013

- A **MMDH Founding Member Program (FMP)** was introduced in early Feb 2013
- All existing or potential IVs who are eligible to join the FMP
- **Key benefits to become a Founding Member:**

1. Joint marketing campaigns with HKEx (e.g. web corner, brochure etc.)
2. Enjoy additional free trial subscriber units
3. Be member of the FMP communication group



Other MMDH Fees related issues:

- For dual live connection in MMDH, only the first additional set will be charged Connection Fee for MMDH (additional set) (i.e. \$70,000/qtr)
- E.g.

<u>Fees</u>	<u>Amount (HK\$)</u>
Redistribution Fee	\$51,000 per quarter
Connection Fee for MMDH (first set)	\$45,000 per quarter x 2
Connection Fee for MMDH (additional set)	\$70,000 per quarter x 1

1

OMD Overview

2

OMD-C Implementation and On-boarding updates

3

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4

OMD – D Product Offerings

OMD-D

- Product Positioning

Derivatives Standard (“DS”)

- Conflated datafeed
- Replacement service for PRS with shorter update interval for DS, only half of the interval between PRS updates or lower.
- Comparable category of latency and content per HKATS NG

Derivatives Premium (“DP”)

- Low latency datafeed
- Replacement service for PRS-Plus, with shorter update interval for DP as the updates of which is driven by any order changes on streaming basis.
- Fit for automatic trading applications

Derivatives FullTick (“DF”)

- Low latency datafeed
- Provide full order information*
- Dissemination of individual orders and trades
- User can build order book.

* No order information is however available during auction session.

OMD-D

- Derivatives Market Datafeed Product Offerings

Datafeed Product		Message Rate	Content	Estimated Bandwidth (preliminary estimation only)		
				Non-Stock Options Market	Stock Options Market	Total
1	Derivatives Standard ("DS") - plus Derivatives Trades (DT)	120,000 messages per second	Conflated update on: - Level 1 (bid/ask quotations) - Level 2 (market by price with 10 market depths) - Trade statistics <i>Plus complimentary DT:</i> Streaming update on: - Individual trades and trade amendments	5Mbps	20Mbps	25Mbps
2	Derivatives Premium ("DP")	200,000 messages per second	Streaming update on: - Level 1 (bid/ask quotations) - Level 2 (market by price with 10 market depths + 11th aggregating remaining book) - Individual trades and trade amendments	10Mbps	60Mbps	70Mbps
3	Derivatives FullTick ("DF")	200,000 messages per second	Streaming update on: - Market by order information - Individual trades and trade amendments - Auction Session: no order information, but COP & equilibrium volume	10Mbps	50Mbps	60Mbps
Optional Product						
1	OMD-Index	<100 messages per second	S&P/HKEx indices and selected indexes from CESC, CSIC and HSIL. <i>(Remarks: OMD Index Feed will be rolled out with OMD-C tentatively in Q2 2013)</i>			1Mbps

Remarks: Bandwidth requirement has accommodated the projected increase in data volume generated from the upgraded trading system.

OMD-D

- Key Features Comparison among Derivatives Standard and PRS

DATA CONTENT	Derivatives <i>Standard</i>	PRS
Real-time Data Content	<i>Derivatives market data:</i> <ul style="list-style-type: none"> Level 2 (market by price with 10 market depths) 	<i>Derivatives market data:</i> <ul style="list-style-type: none"> Level 2 (market by price with 5 market depths)
TECHNICAL ASPECTS		
Message Update Rate (subject to further upgrade)	120,000 messages per second	9,000 messages per second
Updated interval	Shorter update interval for DS. The time between DS updates is only half of the interval between PRS updates or lower.	
Message Protocol	Binary (proprietary & similar to UTP-MD)	Binary (HKEX proprietary)
Transmission Protocol	Multicast	Unicast
Bandwidth Requirement	25Mbps*	5Mbps
Recovery	<ol style="list-style-type: none"> Retransmission (unicast) – recovery of certain or small amount of message lost. Refresh (multicast) – available on a periodic snapshot basis throughout the day. Some bandwidth has been allocated for recovery and so normal data transmission is not affected while Refresh is in progress. 	<ol style="list-style-type: none"> Retransmission – recovery from the last received message Completed database download – provide latest market data image for recovery from long service interruption or late connection to PRS.

Remarks: Bandwidth requirement on DS has accommodated the projected increase in data volume generated from the upgraded trading system.

OMD-D

– Key Features Comparison among Derivatives Premium and PRS-Plus



DATA CONTENT	Derivatives Premium	PRS-Plus
Real-time Data Content	<i>Derivatives market data:</i> <ul style="list-style-type: none"> Level 2 (market by price with 10 market depths) 	<i>Derivatives market data:</i> <ul style="list-style-type: none"> Level 2 (market by price with 5 market depths)
TECHNICAL ASPECTS		
Message Update Rate (subject to further upgrade)	200,000 messages per second	11,000 messages per second
Updated interval	Shorter update interval for DP. DP updates is driven by any order changes on streaming basis whilst the interval between PRS-Plus updates is set on a regular interval .	
Message Protocol	Binary (proprietary & similar to UTP-MD)	Binary (HKEx proprietary)
Transmission Protocol	Multicast	Unicast
Bandwidth Requirement	70Mbps*	7Mbps
Recovery	<ol style="list-style-type: none"> Retransmission (unicast) – recovery of certain or small amount of message lost. Refresh (multicast) – available on a periodic snapshot basis throughout the day. Some bandwidth has been allocated for recovery and so normal data transmission is not affected while Refresh is in progress. 	<ol style="list-style-type: none"> Retransmission – recovery from the last received message Completed database download – provide latest market data image for recovery from long service interruption or late connection to PRS-Plus.

Remarks: Bandwidth requirement on DP has accommodated the projected increase in data volume generated from the upgraded trading system.

HKEx Orion Market Data Platform (OMD)

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Q & A