April 2026

Information Paper

Orion Derivatives Platform (ODP)

Stage 2 – Trading

Contents

SECTION I: INTRODUCTION

Overview

1. This Information Paper is intended to:

    1.1. Provide Exchange Participants (EPs), Clearing Participants (CPs), Independent Software Vendors (ISVs), and clients of the Orion Market Data Platform – Derivatives (OMD-D) with a high-level overview of the Stage 2 Orion Derivatives Platform (ODP), under which trading functionality will migrate from HKATS to the Orion Derivatives Platform –Trading (ODP-TR)

    1.2. Highlight key functional and non-functional changes

    1.3. Outline the implementation approach for all participants to conduct necessary planning for their system adaptations to ODP-TR and the associated changes in OMD-D

2. Scope and limitations of this document:

    2.1. This document is not a technical specification. Detailed interface specifications have been published separately

    2.2. Does not replace formal implementation circulars or rule references

    2.3. Describes designs and timelines that remain subject to regulatory approval and market readiness

Background

3. In 2024, HKEX announced the ODP Program to modernise its derivatives market infrastructure. The Program was initiated in response to evolving market conditions and to support the sustainability of the market microstructure, enabling continued growth of the Derivatives Markets.

4. To meet future requirements for scalability, flexibility, and performance**,** the Hong Kong derivatives market requires an updated platform built on a modern, extensible architecture. The ODP Program was established to support ongoing market growth, improve the efficiency and resiliency of market operations, and reinforce Hong Kong's role as a regional risk management hub, while delivering operational and cost benefits to market participants.

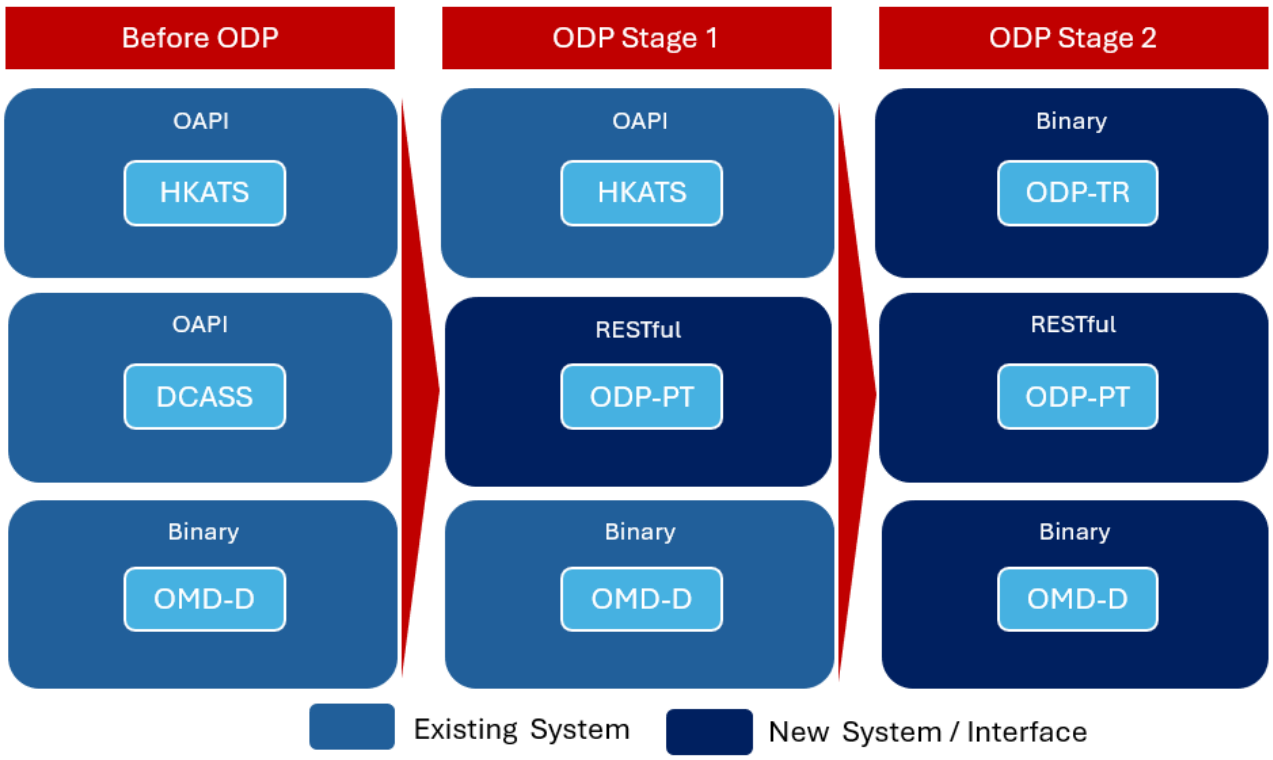
Orion Derivatives Platform

5. ODP is a modular platform built by HKEX's internal technology teams to upgrade derivatives trading, post trade and risk management capabilities. It is designed with a fully decoupled architecture, allowing trading and post trade systems to operate independently.

6. This architectural approach enhances overall platform resilience by reducing the risk of wider service impact from isolated issues and enables HKEX to introduce enhancements in a more controlled and predictable manner, with minimal disruption to market participants.

7. ODP is structured as a staged migration from the legacy system infrastructure to the target infrastructure as illustrated below:

Figure 1: ODP Staged Migration



8. Subject to regulatory approval and market readiness, ODP is targeted to launch fully by Q2 2028, replacing legacy systems and introducing new interfaces and functionalities that align with international best practices.

9. The migration will be delivered in two stages. Stage 1 will introduce ODP-PT as a replacement for DCASS, while HKATS remains as it is today. This "post trade first" approach reduces transition risk. Stage 2 completes the transformation by migrating trading functionality from HKATS to ODP-TR, while OMD-D will be enhanced to align with the rollout of ODP-TR.

ODP Stage 1

10. ODP Stage 1 covers the launch of ODP-PT.

11. Under ODP Stage 1, ODP will enhance market connectivity by transitioning from the existing OAPI interfaces to a RESTful API (ODP-PT API) for Post Trade Services. This transition is intended to standardise interfaces and streamline system integration for CPs.

12. New pricing methodology will provide more accurate and consistent derivatives pricing, both intraday and at end-of-day, including the Daily Settlement Price.

Figure 2: ODP Stage 1 High-Level System Changes

Existing System	New System	High-Level Change
HKATS	N/A	Derivatives trading will continue to operate on HKATS as it does today.
DCASS	ODP-PT	ODP-PT will provide enhanced Post Trade services for CPs. Please refer to the ODP Stage 1 – Post Trade and Risk Management Information Paper for details on the functional delivery of ODP-PT and Risk Management.
OMD-D	N/A	Derivatives market data will continue to operate on OMD-D, as it does today.

ODP Stage 2

13. ODP Stage 2 covers the launch of ODP-TR and the associated changes to OMD-D.

14. Once the Stage 2 migration is complete, ODP-TR and ODP-PT will operate on a modernized architecture. This will make it easier and faster to introduce future business enhancements, as the upgraded platform will provide greater flexibility, improved extensibility, and a more streamlined path for functional changes.

15. Under ODP Stage 2, ODP-TR will enhance exchange connectivity by transitioning from the existing OAPI interfaces to an industry-standard binary protocol. This transition is intended to standardise interfaces and streamline system integration for participants.

16. Under both ODP Stage 1 and Stage 2, the risk management measures will continue to operate using the SPAN margin model.

Figure 3: ODP Stage 2 High-Level System Changes

Existing System	New System	High-Level Change
HKATS	ODP-TR	Targeted to launch in 2028, ODP-TR will provide EPs with upgraded trading connectivity through a new Binary Protocol as well as a new graphical user interface (ODP-TR GUI), replacing the existing HKATS OAPI (OAPI) and HKATS Online. Key improvements include: • Introduction of a new ODP-TR Binary Protocol offering modern, high-performance connectivity • A redesigned gateway architecture linking the Matching Engines to a network of Partition Specific Gateways and Convenience Gateways • Improved system resilience and determinism through a topology optimized for stable and predictable performance • Higher transaction throughput per connection • Introduction of sawtooth throttle model that delivers more consistent response times by allowing activity to be sent in short bursts up to a defined limit within a time window, rather than being evenly spaced over time • Enhanced market-making functionality to better support liquidity provision • Order-level cancel-on-disconnect controls to strengthen EP risk management For specifications relating to ODP-TR, please refer to the relevant documentation in SECTION VII: DOCUMENTATION
ODP-PT	N/A	No functional or interface changes in Stage 2. ODP-PT was delivered under Stage 1 and remains live and operational as part of the ODP architecture.
OMD-D	OMD-D (Uplifted interface)	In Stage 2, OMD-D will be enhanced to align with the rollout of ODP-TR. The enhancements will focus on the OMD-D interface, including the introduction of new message types and updates to selected existing messages, while the core functionalities of OMD-D will remain unchanged. For specifications relating to OMD-D, please refer to the relevant documentation in SECTION VII: DOCUMENTATION

Implementation Schedule

17. The tentative rollout schedule for ODP is subject to market readiness and regulatory approvals. All EPs, CPs, ISVs, and OMD-D Clients are required to validate their systems in accordance with the ODP implementation timeline detailed in SECTION V: IMPLEMENTATION, later in this document.

SECTION II: OVERVIEW OF THE ODP PLATFORM

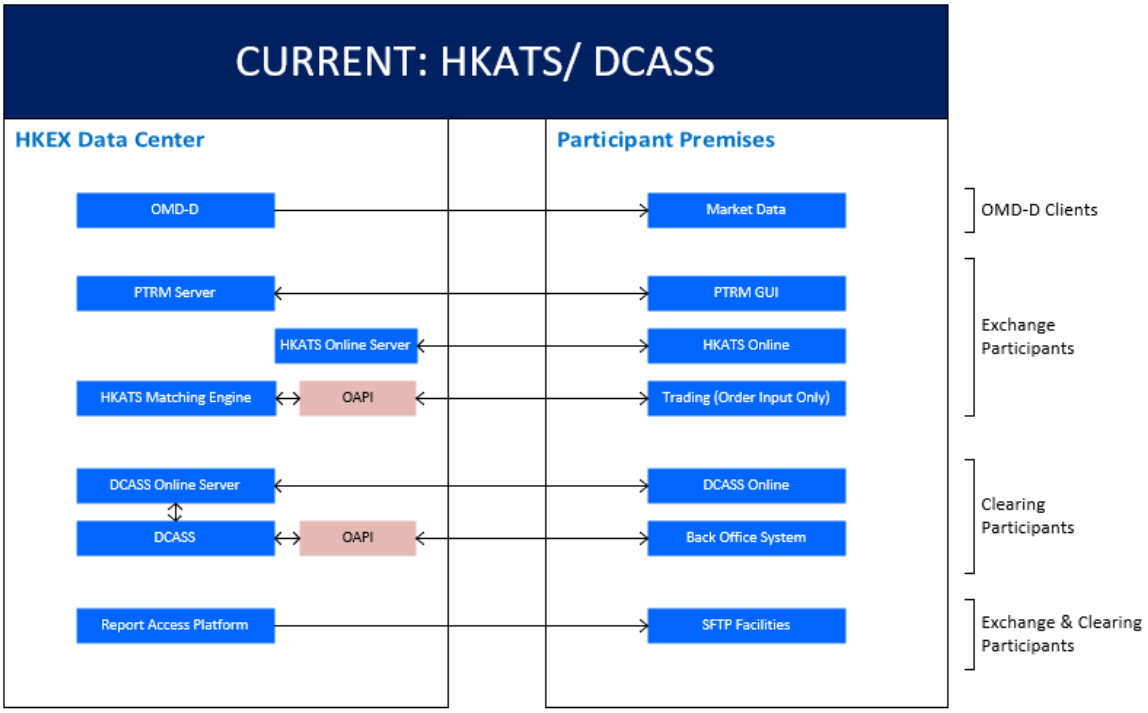
18. The diagrams below are intended to represent points of potential impact to external participants.

19. For the avoidance of doubt, while risk management processing is delivered via HKEX systems, these systems do not require participant integration and are therefore not shown as standalone components in the architecture diagrams.

Current Platform

20. The diagram below represents the legacy architecture, in which HKATS serves as the core trading platform and DCASS provides the corresponding post trade, settlement and risk management functions.

Figure 4: Current Platform



ODP Stage 1

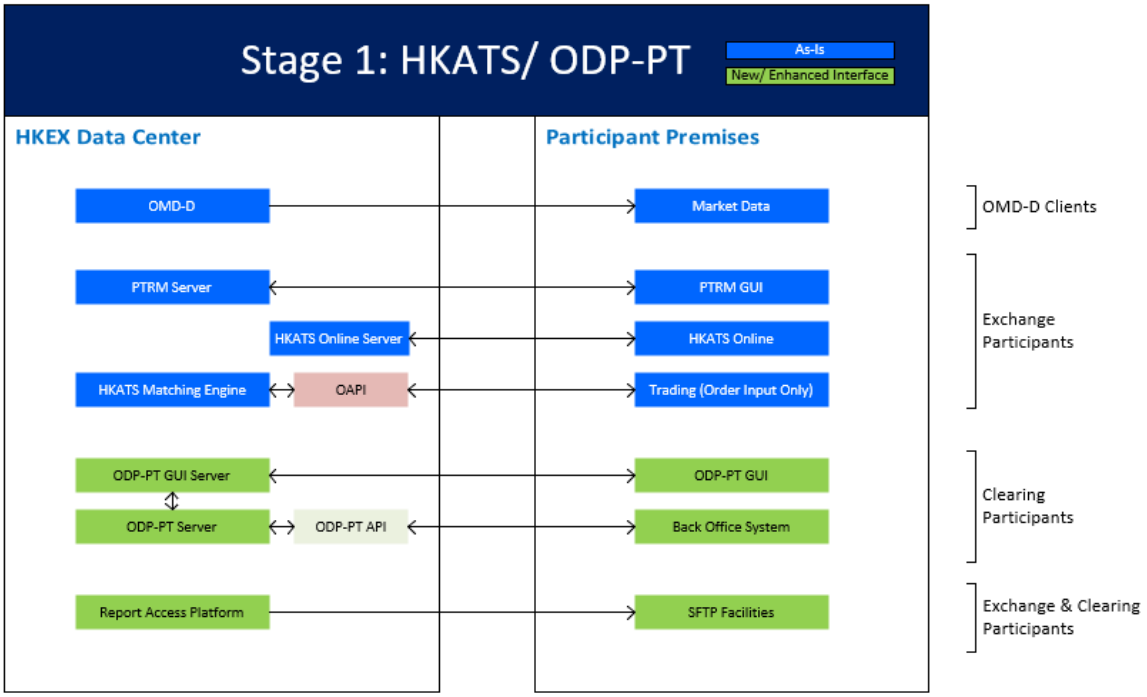
21. ODP Stage 1 transitions DCASS functions to ODP-PT while HKATS will continue to operate as it is today.

22. ODP-PT reports will be standardized in Comma Separated-Value (CSV) format. This standardization supports Clearing Participants' straight through processing and improves data consistency across HKCC and SEOCH.

23. The ODP-PT Report Specifications are planned for publication by April 2026.

24. For SPAN-compatible files, no format changes will be applied to the SPAN RPF file or the position data file.

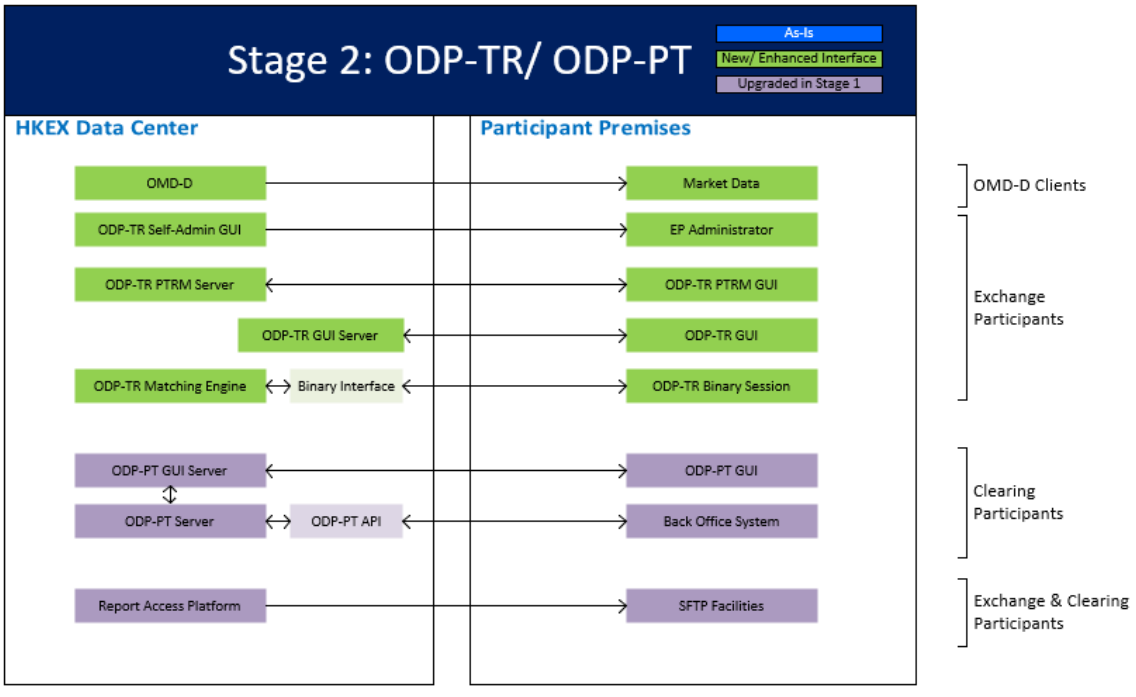
Figure 5: ODP Stage 1 Platform



ODP Stage 2

25. ODP Stage 2 completes the migration by replacing HKATS with ODP-TR.

Figure 6: ODP Stage 2 Platform



SECTION III: KEY HIGHLIGHTS AND CHANGES IN DERIVATIVES TRADING (ODP-TR)

High-Level System Architecture

26. In general, the physical network connectivity to HKATS will remain unchanged from the current arrangement, i.e. via HSN or SDNET / 2. To facilitate a smooth migration and support fallback arrangements, a new set of IP addresses will be assigned to ODP-TR. Correspondingly, new connectivity credentials for both the production and testing ODP-TR environments will be provided to EPs ahead of market rehearsals and the production rollout. Detailed arrangements will be communicated via separate circulars or information papers at a later stage of the programme. EPs are advised to liaise with their network engineers or internal IT departments to prepare for any necessary network and firewall reconfigurations.

27. To ensure that system development and certification testing can be completed in accordance with the master ODP schedule, EPs are advised to commence the required network reconfigurations for the ODP-TR and OMD-D external testing environments from Q3 2026. Detailed network configuration information for connectivity to the ODP-TR and OMD-D external testing environments will be announced in due course via separate documents.

Change of Connectivity Protocol

28. The connectivity protocol will be migrated from OAPI to the ODP-TR Binary Protocol. The detailed specification of the ODP-TR Binary Protocol has been published on the Electronic Communication Platform (ECP). A mapping between the OAPI and the ODP-TR Binary Protocol is set out in Appendix A1. Messages will be restructured following the change in connectivity protocol. This includes, for example, the standardisation of multiple versions of Mass Quote transactions.

29. In addition, functional enhancements will be introduced for Mass Quote, Mass Cancel, Cancel on Disconnect (COD), and Market Maker Protection (MMP). Further details will be articulated in the Functional Changes section, later in this document.

30. With respect to exchange connectivity arrangements, a new set of connectivity credentials will be provided for the ODP-TR Binary Protocol, the ODP-TR GUI and the ODP-TR PTRM GUI. Logistical details will be announced shortly ahead of the migration date. HSN connectivity will also require certain network configuration changes to enable EP systems to connect to ODP-TR.

Enhanced Gateway Topology

31. Under the existing architecture, EPs connect to HKATS using the OAPI through 26 primary Central Gateways (CGs), providing access to all products across the 6 Matching Engines (i.e. Convenience Gateway topology). In the event of a connectivity failure via a primary CG, EPs will reconnect to HKATS through one of the five contingency CGs.

32. In ODP Stage 2, ODP-TR will have multiple Matching Engines for different product groupings. The list of proposed product allocations for each Matching Engine can be found in Appendix A2.

33. Under the new gateway topology, there will be Orion Derivatives Platform - Convenience Gateways (ODP-CG) and Orion Derivatives Platform - Partition Specific Gateways (ODP-PSG).

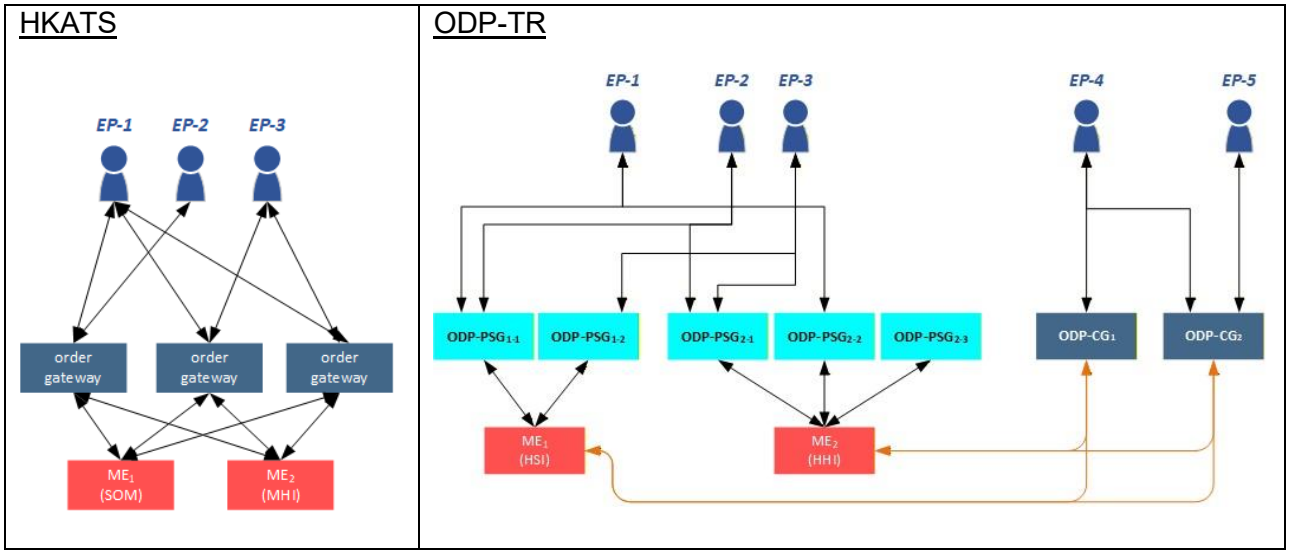
34. With ODP-CG, EPs can access all markets. Orders submitted to ODP-TR via ODP-CGs will be automatically routed to the appropriate Matching Engine.

35. ODP-PSGs will connect directly to a designated Matching Engine, while a single Matching Engine can be accessed by multiple ODP-PSGs. All transactions going through a specific ODP-PSG apply only to the corresponding Matching Engine.

36. EPs connecting to an ODP-PSG or ODP-CG must first connect to a predefined Lookup Service and request a connection point (an IP address and port) to the gateway. EPs should connect to the Lookup Service using one of the four Lookup Service IP-port pairs. The Exchange will publish the connection details at a later stage via ODP-TR Binary Gateway Connectivity Guide. If the Lookup Request is accepted, the Lookup Service will deliver two IP address and port pairs (one for the primary and one for the standby) of the gateway trading service to the EP via the Lookup Response. EPs are expected to always attempt the primary one first then the standby one.

37. EPs are encouraged to review and, where appropriate, reallocate their connections between Partition-Specific Gateways and Convenience Gateways, considering the trading preferences and operational requirements of individual connections.

Figure 7: Gateway topology comparison



Static Reference Data

38. Under ODP Stage 2, OMD-D will be the sole source of static reference data. EPs, ISVs and OMD-D Clients should obtain all reference data from OMD-D. For specifications relating to OMD-D, please refer to the relevant documentation in SECTION VII: DOCUMENTATION.

39. The core design of ODP enables ODP-TR, ODP-PT, and OMD-D to operate independently. EPs, CPs, OMD-D Clients, and ISVs are reminded to ensure that the design of their respective systems considers that these systems may start up and shut down in different sequences.

40. Certain broadcast messages that were available in HKATS will no longer be available under ODP-TR. Please see the arrangement of the broadcast message in Appendix A3.

Functional Changes

Trading Timetable

41. The trading timetable defines the trading schedule for various markets by specifying the start and end times of different trading states. In HKATS, trading states govern system behaviour and provide market participants with an indication of the applicable order types and trading functionalities available in each session. Trading states in HKATS also act as triggers for certain system functions and supervisory mechanisms, such as the Volatility Control Mechanism (VCM) and Dynamic Price Limit (DPL). Under ODP-TR, the trading states adopt a simpler and more condensed design, with the following key features:

41.1. Built-in Functions within trading states in ODP-TR.

- To simplify the maintenance of trading states, ODP-TR will consolidate multiple trading states into a single state with embedded, configurable function triggers
- In HKATS, trading states control the activation of specific functions. For example, the “OPEN_DPL_VCM” state is used to activate the VCM 15 minutes after the commencement of the “OPEN_DPL” state
- In ODP-TR, the two trading states “OPEN_DPL” and “OPEN_DPL_VCM” will be merged into a single state, namely “OPEN_DPL_VCM_AM”. VCM monitoring will be activated 15 minutes after the start of the “OPEN_DPL_VCM_AM” state and will be disabled during the last 20 minutes of the trading session
- Similarly, AHT_INACT_T_ORDER and AHT_PRE_MKT_ACT in HKATS will be merged into AHT_PRE_MKT_ACT in ODP-TR such that the inactivation of non-T+1 orders and the order-inactivation process will commence at 16:49 during the “AHT_PRE_MKT_ACT” state
- The Instrument Session State (ISS) concept in HKATS for VCM and AHT Trading Halt will not carry forward to ODP-TR.

41.2. Arrangement of Post Trade States

- Under the decoupled system architecture, ODP-TR and ODP-PT will operate under their own respective Trading and Post Trade states. As a result, the “CL_START” or “CL_CLOSE” states, which were previously used to support Post Trade processes in DCASS, have been removed from ODP-TR

41.3. Unified Trading Session States

- ODP-TR will consolidate trading states that have different names but identical behaviour into a single state
- For example, the session states “AHT_CLOSE”, “AHT_CLOSE_E”, “CLOSE_TODAY”, “CLOSE_TODAY_E”, and “CLOSE”, which are currently

used in the HKATS, will be consolidated into a single state named “CLOSE” in ODP-TR. This standardisation simplifies naming conventions and streamlines trading timetable configuration

Figure 8: Trading Timetable of HSI Futures in HKATS

Seq.	Trading States	Start Time	Transition Mode	Warning Interval	No. of Warnings	Start Interval
1	CL_START	7:30:00	Automatic	300	2	0
2	PREOPEN	8:45:00	Automatic	300	2	0
3	PREOPENALLOC	9:09:00	Automatic	0	0	60
4	OPENALLOC	9:12:00	Automatic	0	0	60
5	PAUSE	9:14:00	Automatic	0	0	0
6	OPEN_DPL	9:15:00	Automatic	60	1	0
7	OPEN_DPL_VCM	9:30:00	Automatic	300	2	0
8	PAUSE	12:00:00	Automatic	300	2	0
9	RESET_VCM	12:29:00	Automatic	0	0	0
10	PREOPEN	12:30:00	Automatic	60	1	0
11	PREOPENALLOC	12:54:00	Automatic	0	0	60
12	OPENALLOC	12:57:00	Automatic	0	0	60
13	PAUSE	12:59:00	Automatic	0	0	0
14	OPEN_DPL	13:00:00	Automatic	60	1	0
15	OPEN_DPL_VCM	13:15:00	Automatic	300	2	0
16	OPEN_DPL	16:10:00	Automatic	300	2	0
17	BLK_TRADE_ONLY	16:30:00	Automatic	300	2	0
18	CLOSE_TODAY	16:45:00	Automatic	300	2	0
19	AHT_INACT_T_ORDER	16:47:00	Automatic	0	0	0
20	AHT_PRE_MKT_ACT	16:49:00	Automatic	60	1	0
21	AHT_NEXT_DAY	17:14:00	Automatic	0	0	0
22	AHT_OPEN_PL	17:15:00	Automatic	60	1	0
23	AHT_CLOSE	3:00:00	Automatic	300	2	0
24	CL_CLOSE	3:01:00	Automatic	60	1	0
25	DAYEND	3:15:00	Automatic	0	0	0

Figure 9: Trading Timetable of HSI Futures in ODP-TR

Seq.	Trading Session	Start Time	Transition Mode	Trading State	Alert Interval	No. of Alerts
1	Morning	8:45	A	PREOPEN	300	2
2	Morning	9:09	A	PREOPENALLOC		
3	Morning	9:12	A	OPENALLOC		
4	Morning	9:14	A	PAUSE		
5	Morning	9:15	A	OPEN_DPL_VCM_AM	60	1
6	Morning	12:00	A	PAUSE	300	2
7	Afternoon	12:30	A	PREOPEN	60	1
8	Afternoon	12:54	A	PREOPENALLOC		
9	Afternoon	12:57	A	OPENALLOC		
10	Afternoon	12:59	A	PAUSE		
11	Afternoon	13:00	A	OPEN_DPL_VCM	60	1
12	Afternoon	16:30	A	BLK_TRADE_ONLY	300	2
13	Afternoon	16:45	A	CLOSE	300	2
14	AHT	16:49	A	AHT_PRE_MKT_ACT	60	1
15	AHT	17:15	A	AHT_OPEN_PL	60	1
16	AHT	3:00	A	CLOSE	300	2
17	AHT	3:15	A	DAYEND		

Trade Number in BD6

42. Under the existing coupled architecture in HKATS, EPs receive execution confirmations via BO5 messages from HKATS and BD6 messages from DCASS. While the two message types contain largely the same information, the BD6 message includes an additional Trade Number that is not present in the BO5 message. This Trade Number in HKATS is a mandatory identifier used for trade identification, reporting, and the initiation of error trade claims.

43. Under the decoupled architecture in ODP-TR, the Trade Number will be replaced by a Trade ID generated by ODP-TR, rather than ODP-PT. The Trade ID generated by ODP-TR will also be disseminated via ODP-PT. EPs and CPs are therefore reminded to review and, where necessary, update their operational procedures and data structures to support this Trade ID mapping arrangement.

One-to-Many Trade Dissemination

44. In HKATS, one-to-many executions are disseminated to participants as a single execution message. Under ODP-TR, one-to-many executions will instead be disseminated as multiple messages, with each message corresponding to an individual execution. Each execution message will carry a unique Trade ID for identification purposes.

Example 1

A buy order with a quantity of 50 is matched against three sell orders with quantities of 25, 15, and 10 respectively, as illustrated below

Figure 10: Example 1 - One-to-many trade dissemination

Quantity	Bid	Ask	Quantity
50	**1.25**	**1.25**	**25**
20	1.20	**1.25**	**15**
		1.25	**10**
		1.30	20

45. Upon execution of the order in the above example, the buyer will receive execution messages as follows:

Figure 11: Example 1 - One-to-many trade dissemination (continued)

HKATS

Trade Number	Executed quantity
5001	50

Single message & unique trade number

ODP-TR

Trade ID	Executed quantity
6001	25
6002	15
6003	10

3 messages & unique trade IDs

Kill Switch

46. A new message-based Kill Switch will be introduced in ODP-TR binary protocol. The Kill Switch function will be available via both the ODP-TR Binary Protocol and the ODP-TR PTRM GUI. Activation of the Kill Switch at the binary session level will apply to orders and quotes for that session and all other binary sessions belonging to the same EP.

47. EPs are advised to exercise diligence when using the kill switch. HKEX will follow up with the participant on the reason for using kill switch.

Block Trade

Types of block trade

48. The existing block trade types in HKATS, namely T1 (Internal Trade Report), T2 (Combo Trade Report) and T4 (Interbank Trade Report), will be converted into two types of block trade in ODP-TR, namely internal block trade and interbank block trade. Please see the table below for the comparison.

Figure 12: Block trade in ODP-TR

Features	Internal Block Trade	Interbank Block Trade
Purpose	Facilitates block trades within an EP	Facilitates block trades between two EPs
Submission requirements	Submitter must provide full details of the block trade (price, quantity, buyer and seller information for each leg)	Submitter must specify the counterparty, and provide one-sided details (price, quantity and side for each leg)
Matching process	Trades are registered immediately upon validation	Trades are matched if a counterparty submits a matching request; otherwise, it will be stored as pending block trade request
Trade dissemination	Trades are disseminated to the submitter	Trades are disseminated to both users who submitted the matched requests
Pending trade handling	N/A	If unmatched, notifications will be sent to both submitter and the designated counterparty

Block trade validations

49. In HKATS, there are validations on several parameters, including trading state, user, counterparty, maximum number of legs, contracts, tick size and block trade size limits. On top of these validations, ODP-TR will have additional validations upon submission of a block trade in the following areas:

    49.1. **Static price limits:** The validation is to verify that the price of the submitted leg meets the static price limit of its corresponding instrument.

    49.2. **Price warning:** To check whether the price of the submitted legs would potentially violate the price range. This serves an alert to EPs that the price may be outside of the range of (high, low, best bid and best ask), which may be a potential invalid block trade. In ODP-TR GUI, a price warning window will pop up to alert EPs when there is potential violation. EPs can choose to proceed and submit the block trade request. Whereas in the ODP-TR Binary Protocol, EPs can choose to disable the price warning validation. Nonetheless, EPs can choose to proceed and submit the block trade request. If multiple legs fall outside the specified range, only the first leg identified as being outside the range will be displayed in the message.

49.3. **Minimum Volume Threshold (MVT):** To pass this validation, at least one leg's quantity within a single block trade must be greater than or equal to the MVT of the corresponding Instrument / Standard Combo. For the MVT of each product, please refer to the HKEX website.

Example 1

A single-leg block trade

Figure 13: MVT validation for a single-leg block trade

HKATS — ACCEPT

Contract	QTY / PRICE	
ID	QTY	PRICE
HSIF6	10	26555

A block trade that does not meet MVT will be accepted by HKATS

ODP-TR — REJECT

Contract	QTY / PRICE	
ID	QTY	PRICE
HSIF6	10	26555

A block trade that does not meet MVT will be rejected by ODP-TR

Example 2

Two single-leg block trades

Figure 14: MVT validation for two single-leg block trades

HKATS — ACCEPT

Contract	QTY/PRICE	
ID	QTY	PRICE
HSIF6	10	9175

HKATS — ACCEPT

Contract	QTY/PRICE	
ID	QTY	PRICE
PHH9300B6	**90**	132

Block trades that do not meet MVT will be accepted by HKATS

ODP-TR — REJECT

Contract	QTY/PRICE	
ID	QTY	PRICE
HHIF6	10	9175

ODP-TR — ACCEPT

Contract	QTY/PRICE	
ID	QTY	PRICE
PHH9300B6	100	132

Only block trades that meet MVT will be accepted by ODP-TR

Example 3

A single multi-leg block trade

Figure 15: MVT validation for single multi-leg block trade

HKATS — ACCEPT

Contract	QTY/PRICE	
ID	QTY	PRICE
HSIF6	10	9175
PHH9300B6	90	132

ODP-TR — ACCEPT

Contract	QTY/PRICE	
ID	QTY	PRICE
HHIF6	10	9175
PHH9300B6	**100**	132

Block trades that do not meet MVT will be accepted by HKATS (and subsequently cancelled by the Exchange)	Block Trades that meet MVT will be accepted by ODP-TR. Acceptance is triggered if at least one leg within a single block trade meets the MVT threshold

50. In addition to system validations, HKEX will conduct checks on submitted block trades to ensure that they are within the permissible price range. Invalid block trades will be rejected.

New block trade attributes

51. There will be new optional block trade attributes in ODP-TR as specified in the table below.

Figure 16: New block trade attributes in ODP-TR

New attributes in ODP-TR	Usage
ATID	For incentive tracking
Trade conclusion date & time	To indicate the trade conclusion date and time negotiated between the two parties.
Aggregated trade indicator	To indicate whether it is an aggregated block trade
Special indicator	To indicate the source of pricing: "BTIC" – Basis trade based on the index closing price "PPR2" – Basis Trades at Index Close ("BTIC") function of the HKEX MSCI Overnight Trade Report feature

Self-Match Prevention

52. The Self-Match Prevention ("SMP") functionality currently available in the HKATS will be migrated to ODP-TR. However, the format of the SMP ID will be revised from a 5-character alphanumeric format (as used in HKATS) to a 9-digit numeric format in ODP-TR, to align with the SMP ID format adopted in the HKEX Cash Market.

Order Management

Order Attributes

53. Several new order attributes will be introduced in ODP-TR to support more clearly defined use cases and enhanced functionalities. Illustrative examples are provided below.

Figure 17: New Order attributes in ODP-TR

Order Attribute in ODP-TR	Type	Usage
ATID	Optional	For incentive tracking
Client order ID	Mandatory	Unique identifier for the order assigned by the market participant
Cancel Hint Value	Optional	A 16-bit hint field for Mass Cancellation and On-Behalf of Cancellation feature. More information will be provided below
Cancel on Disconnect	Optional	Specifies whether an order is subject to the COD

Order Attribute in ODP-TR	Type	Usage
(COD) indicator		function
SMP ID	Optional	Dedicated field for entering the SMP ID, used to prevent matching against an opposite order when both the buy and sell orders contain the same SMP ID

Order Amendments

54. Under HKATS, an amendment to order quantity replaces the residual quantity of the order, regardless of any partial fills that occurred prior to the amendment. In contrast, under ODP-TR, an amendment to order quantity will revise the total quantity of the original order, taking into account any quantity that has already been partially filled before the amendment.

Example 1

- EP enters an order of 10 lots
- Order receives a partial fill of 7 lots
- The EP amends the order quantity to 8 lots.

Figure 18: Example 1 - Order amendment comparison

HKATS

Original quantity	10
Executed quantity	7
Remaining quantity	3
Outstanding quantity after amendments	3 → 8

Amendment logic
- Replaces residual quantity of the original order (3 → 8 lots)

Note
- Outstanding quantity becomes 8 lots
- Since there is an increase in quantity, order priority will be lost

ODP-TR

Original quantity	10
Executed quantity	7
Remaining quantity	3
Outstanding Quantity after amendments	1 (10 → 8) given 7 lots have been executed

Amendment logic
- Amends the total quantity of the original order (10 → 8 lots)
- Takes executed quantity into account (7 lots have been executed → only 1 lot is outstanding)

Note
- Outstanding quantity becomes 1 lot
- Since the quantity has been reduced in this case, the priority remains unchanged

Example 2

- EP enters an order of 10 lots
- Order receives a partial fill of 7 lots
- The EP amends the order quantity to 2 lots

Figure 19: Example 2 - Order amendment comparison

HKATS

Original quantity	10
Executed quantity	7
Remaining quantity	3
Outstanding quantity after amendments	3 → 2

Amendment logic
- Replace residual quantity of the original order (3 → 2 lots)

Note
- Outstanding quantity becomes 2 lots
- Since there is a decrease in quantity, order priority will not be affected

ODP-TR

Original quantity	10
Executed quantity	7
Remaining quantity	3
Outstanding Quantity after amendments	0 (10 → 2) given 7 lots have been executed

Amendment logic
- Amend the total quantity of original order (10 → 2 lots)
- Takes executed quantity into account (7 lots have been executed → No outstanding)

Note
- Outstanding quantity becomes 0 lots

Example 3

- EP enters an order of 10 lots
- Order receives a partial fill of 7 lots
- The EP amends the order quantity to 13 lots

Figure 20: Example 3 - Order amendment comparison

HKATS

Original quantity	10
Executed quantity	7
Remaining quantity	3
Outstanding quantity after amendments	3 → 13

Amendment logic
- Replace residual quantity of the original order (3 → 13 lots)

Note
- Outstanding quantity becomes 13 lots
- Since there is an increase in quantity, order priority will be lost

ODP-TR

Original quantity	10
Executed quantity	7
Remaining quantity	3
Outstanding Quantity after amendments	6 (10 → 13) given 7 lots have been executed

Amendment logic
- Amends the total quantity of original order (10 → 13 lots)
- Takes executed quantity into account (7 lots have been executed and only 6 lots are outstanding)

Note
- Outstanding quantity becomes 6 lots
- Since there is an increase in quantity, order priority will be lost

Quotes Management

Quote attributes

55. Similar to orders, a number of new quote attributes will be introduced in ODP-TR to support more clearly defined use cases and enhanced functionalities. Illustrative examples are provided below.

Figure 21: New quote attributes in ODP-TR

Quote Attribute in ODP-TR	Type	Usage
ATID	Optional	For incentive tracking
Cancel Hint Value	Optional	A 16-bit hint field for Mass Cancellation and On-Behalf of Cancellation feature. More information will be provided below.
Quote attribute flags (MMP indicator)	Optional	Indicates that the quote is subject to the Market Maker Protection (MMP) function (refer to paragraph 58 for details).
SMP ID	Optional	A dedicated field for specifying the SMP ID to avoid execution against opposite-side orders with the same SMP ID.

Mass quote

56. There are multiple versions of Mass Quote transaction in HKATS, namely MO93, MO96 and MO960, with minor functional differentiations. ODP-TR will consolidate all these Mass Quote transactions into one mass quote message in the ODP-TR Binary Protocol.

57. Key changes to mass quote functions in ODP-TR are listed below:

    57.1. **Quote pair limit:** The maximum number of quotes pairs per transaction will be reduced from 10 to 8

    57.2. **Restriction on underlying:** Each mass quote transaction will be restricted to only one underlying

    57.3. **Multiple quote pairs:** Allow multiple pairs of quotes for one instrument within one mass quote message

Figure 22: Stipulations of mass quote

<table>
<tr>
<td>HKATS

Unauthorised mass quote

<table>
<tr><th>Instrument</th><th>Quantity</th><th>Bid</th><th>Ask</th><th>Quantity</th></tr>
<tr><td>AAA50.00M5</td><td>30</td><td>1.25</td><td>1.35</td><td>30</td></tr>
<tr><td>AAA50.00M5</td><td>20</td><td>1.15</td><td>1.40</td><td>20</td></tr>
<tr><td>AAA50.00U5</td><td>20</td><td>1.25</td><td>1.35</td><td>20</td></tr>
<tr><td>AAA50.00U5</td><td>10</td><td>1.15</td><td>1.40</td><td>10</td></tr>
</table>

Supports submission of only one quote pair per instrument in a single transaction</td>
<td>ODP-TR

Permitted mass quote

<table>
<tr><th>Instrument</th><th>Quantity</th><th>Bid</th><th>Ask</th><th>Quantity</th></tr>
<tr><td>AAA50.00M5</td><td>30</td><td>1.25</td><td>1.35</td><td>30</td></tr>
<tr><td>AAA50.00M5</td><td>20</td><td>1.15</td><td>1.40</td><td>20</td></tr>
<tr><td>AAA50.00U5</td><td>20</td><td>1.25</td><td>1.35</td><td>20</td></tr>
<tr><td>AAA50.00U5</td><td>10</td><td>1.15</td><td>1.40</td><td>10</td></tr>
</table>

Supports multiple quote pairs for a single instrument within one transaction.
A maximum of eight quote pairs may be submitted in a single transaction.</td>
</tr>
<tr>
<td>Permitted mass quote

<table>
<tr><th>Instrument</th><th>Quantity</th><th>Bid</th><th>Ask</th><th>Quantity</th></tr>
<tr><td>AAA50.00M5</td><td>30</td><td>1.25</td><td>1.35</td><td>30</td></tr>
<tr><td>AAA51.00M5</td><td>20</td><td>1.15</td><td>1.40</td><td>20</td></tr>
<tr><td>BBB50.00U5</td><td>20</td><td>1.25</td><td>1.35</td><td>20</td></tr>
<tr><td>BBB51.00U5</td><td>10</td><td>1.15</td><td>1.40</td><td>10</td></tr>
</table>

Allows quotes on different underlyings within the same ME to be submitted in a single transaction.</td>
<td>Unauthorised mass quote

<table>
<tr><th>Instrument</th><th>Quantity</th><th>Bid</th><th>Ask</th><th>Quantity</th></tr>
<tr><td>AAA50.00M5</td><td>30</td><td>1.25</td><td>1.35</td><td>30</td></tr>
<tr><td>AAA51.00M5</td><td>20</td><td>1.15</td><td>1.40</td><td>20</td></tr>
<tr><td>BBB50.00U5</td><td>20</td><td>1.25</td><td>1.35</td><td>20</td></tr>
<tr><td>BBB51.00U5</td><td>10</td><td>1.15</td><td>1.40</td><td>10</td></tr>
</table>

Restricted to a single underlying per transaction. Transactions containing multiple underlyings (e.g. AAA and BBB) are not permitted.</td>
</tr>
</table>

Market Maker Protection (MMP)

58. To enhance the flexibility and usability of the Market Maker Protection (MMP) function, a new attribute will be introduced in ODP-TR to allow Market Makers (MMs) to indicate

whether a specific quote is subject to MMP. Quotes marked as excluded from MMP will continue to count towards the protection quantity but will not be cancelled when MMP is triggered for the underlying. By default, quotes not marked as excluded will be cancelled when MMP is triggered.

Timestamp

59. Timestamps for orders and quotes in ODP-TR will be represented with nine decimal places. The effective timestamp precision is five decimal places, with the remaining four decimal places reserved for future use.

Enhancements in Mass Cancellation & Cancel Hint Value

Mass cancellation by selection criteria

60. Broader selection criteria will be available in ODP-TR for mass cancellations, where EPs can filter by market, instrument type and choose to cancel all outstanding orders and quotes.

Mass cancellation by cancel hint value

61. Cancel hint value is a new 16-bit field that will be introduced in ODP-TR to enhance the flexibility and usability of mass cancellation on orders and quotes. EPs can choose either (1) bitwise AND matching and (2) range matching when doing the cancellation.

    61.1. Cancellation method 1 – Bitwise AND Matching

    - Figure 23 below shows the Cancel Hint values for 3 orders, while figure 24 shows the results of different mass cancellation criteria on the aforementioned 3 orders.

Figure 23: Cancel hint values

Order 1	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Order 2	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0
Order 3	0	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 24: Results of different mass cancellation criteria

Case	Mass cancellation criteria	Results
1	**1** 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	No orders will be cancelled
2	0 **1** 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Order 1 & 3 will be cancelled
3	0 **1** **1** 0 0 0 0 0 0 0 0 0 0 0 0 0	Order 1, 2 & 3 will be cancelled

61.2. Cancellation method 2 – Range Matching

- Figure 25 shows the Cancel Hint values for 3 orders, while figure 26 shows the results of different mass cancellation criteria on the aforementioned 3 orders.

Figure 25: Cancel hint value for 3 orders

Order 1	123
Order 2	456
Order 3	5000

Figure 26: Results of different mass cancellation criteria

Case	Mass cancellation criteria	Results
1	From 50 to 100	No order will be cancelled
2	From 123 to 123	Order 1 will be cancelled
3	From 123 to 456	Orders 1 and 2 will be cancelled

Cancel on Disconnect (COD)

62. Heartbeat configurations in HKATS necessitate backend reconfigurations by HKEX. In ODP-TR, EPs can adjust the heartbeat interval the via binary session upon logging into ODP-TR.

63. Prior to ODP, the COD mechanism applies to all orders and quotes of the corresponding OAPI session. In ODP-TR, COD can be overridden at the order level through a COD exemption indicator, allowing such orders to remain in the order book when COD is triggered. COD remains mandatory for quotes, and all quotes from the relevant binary session will be removed upon meeting COD conditions.

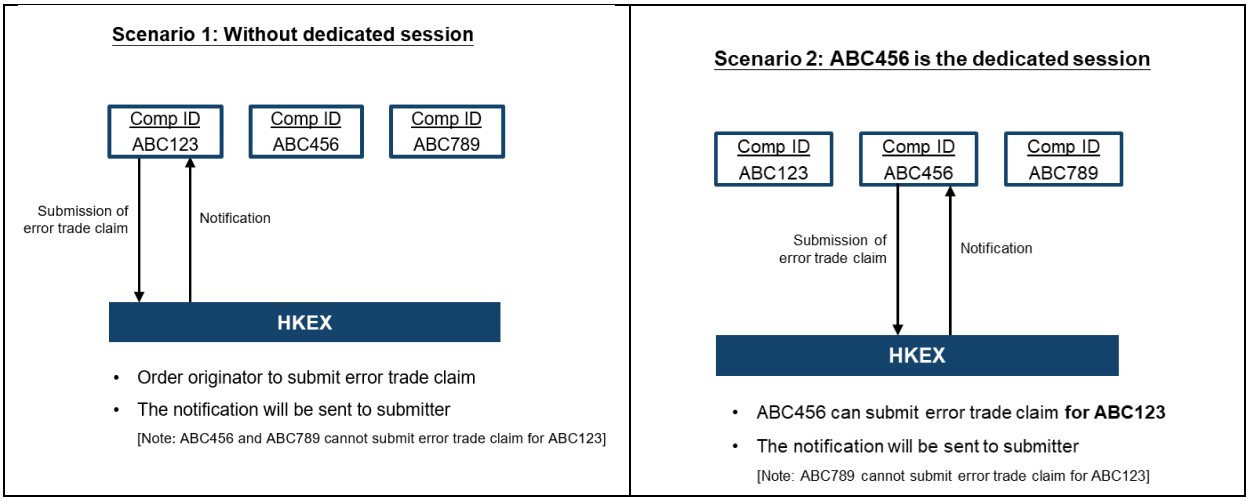
Error Trade & Trade Cancellation

64. Error trade claim request or trade cancellation request could only be made via phone calls or emails to HKATS Support. New messages will be introduced in ODP-TR to enable EPs to initiate error trade claims via the ODP-TR Binary Protocol. This enhancement is intended to improve the timeliness, accuracy, efficiency, and control of the overall error trade handling process. EPs are strongly encouraged to conduct a compliance and control review when adopting the new binary messages for error trade claims.

Claim Handling

65. EPs can handle error trade claims using their own session or choose to nominate a dedicated session to handle error trade related messages (from the same Participant ID). This includes the submission of error trade claims, as well as receiving claim notifications from HKEX.

Figure 27: Demonstration of dedicated session



65.1. Claim Submission and Communications

- EPs can submit error trade claims via the ODP-TR GUI or the binary session of the order originator.
- Alternatively, EPs can nominate a dedicated trading session in ODP-TR to handle all error trade messages.
- To prevent duplicate error trade claims from being initiated across different trading sessions, the system will reject any error trade claim if a claim for the same trade is already in progress, irrespective of the initiating session.
- Derivatives Trading Operations will acknowledge the eligibility of error trades by electronic notification to counterparties after validation.
- Counterparties should respond to the error trade claim request via the ODP-TR GUI or their binary session within a configurable time.
- A message will be sent to both the claim-submitting binary session and the counterparty's claim-accepting binary session. The message will include the claim status, the Trade ID of the claimed trade, and the corresponding traded price and quantity.

65.2. Claim validations

- ODP-TR will compare time of error trade versus the claim submission time. ODP-TR will reject the claim if the submission time exceeds the prescribed time limit specified in the rules.

65.3. Claim Confirmation

- The relevant trades will be cancelled by ODP-TR upon the confirmation of the eligibility of an error trade claim.
- The associated trade cancellation message will be sent to the claimant as well as the counterparty via the original order session. The message includes the Trade ID, price and quantity of the cancelled trade.

Daily Market Reports (DMR)

66. There will be slight adjustments in releasing the data:

    66.1. Trading data (including volume, open, high, low and close price) of respective contracts will be released once it is available (shortly after market close).

    66.2. Data from Post Trade (open interest, change in open interest, settlement price and change in settlement price) will be supplemented upon the completion of Post Trade processing.

    66.3. HKEX may update the file if there is any adjustment to the information in the report. Detailed arrangements will be released in due course.

GUI Changes

67. HKATS supports separate login credentials for both HKATS Online and Pre-trade Risk Management (PTRM) GUI. In ODP-TR, there will be a replacement for the PTRM GUI and HKATS Online. A centralised login will be introduced for identity validation. EPs who need access to ODP-TR GUI and the new ODP-TR PTRM GUI should apply for the login credentials via HKEX Client Services.

ODP-TR GUI

68. There will be a new window and changes to an existing window and information in the ODP-TR GUI.

    68.1. New window – “Trade” window

    - This window will display the EP’s valid trades for the current trading day, together with their latest status
    - EPs may use this window to view and manage their trades, including the submission of error trade claims upon selection of a specific trade
    - The trade view will automatically update to reflect any changes to the EP’s latest valid trades
    - Several criteria can be used to filter trade records, including instrument series ID, participant, side, market and underlying
    - Records can be exported into a CSV file

    68.2. Changes to “Change Order” window

    - The “Change Order” window will include additional fields, namely “Total Order Quantity” and “Executed Quantity”, to allow EPs to view the total quantity and remaining quantity of the original order
    - Most functionalities of the “Change Order” window remain the same as those in HKATS, except for the logic governing quantity changes for partially filled orders (refer to the Order Amendments section under Functional Changes for details)

- If an order has been matched when an EP attempts to amend the order, a warning message will be displayed for the EP's confirmation

- For the avoidance of doubt, any increase in quantity, change in price, or modification of the SMP token field will result in a loss of order priority

68.3. Decommissioning of the Quote Reply window

- The Quote Reply window will be decommissioned in ODP-TR. Market Makers may continue to provide quotes to the market using the Single Quote or Mass Quote functions

68.4. Decommissioning of the provision of open interest data

- Open interest continues to be calculated and maintained in ODP-PT and is not displayed in the ODP-TR GUI.

EP Self Admin Portal

69. A new EP Self Admin Portal will be introduced in ODP-TR, which is a GUI-based tool designed to enable EPs to manage trading-related configurations. Each EP should nominate at least three ODP-TR GUI Users as admin users. Such admin users can perform specific administrative tasks on behalf of their EP, with changes taking effect on the next day.

70. The available services are listed below:

70.1. **View Admin Account / Participant / Users Account Details:** The EP Admin Users can view details of their own account, their effective EP configurations and all effective user account's details under that same EP.

70.2. **Nominate Error Trade Claim Session:** The EP Admin Users can nominate a single Binary Session or ODP-TR GUI User under the EP such that the session can respond to Error Trade claims raised by counterparty EPs and approved by the Exchange. If there is no nomination, then the Error Trade Claim Response will be received by the trade's original counterparty session.

70.3. **Amend Max Order Size / Block Trade Size Limit per Trading Right:** The EP Admin Users can adjust the Max Order Size Limit and Max Block Trade Size Limit per Trading Right at the Participant level.

70.4. **Nominate Binary Sessions to Receive Market Messages:** The EP Admin Users can nominate a binary session to receive Market Messages

Combinations Orders – Implied Orders

71. The generation and execution logic for implied orders has been updated to align with international market practices. The general properties, generation rules, execution sequence, and behavioural differences between ODP-TR and HKATS are outlined below. Examples on the generational logic, execution sequence and regeneration logic are provided in Appendix A4.

72. General properties of implied orders in ODP-TR include:

    72.1. Processed separately from explicit orders for execution

    72.2. Implied liquidity at the same price level is aggregated

    72.3. A dedicated data message for each price level is disseminated to the market

Generation and Aggregation Logic

73. The generation sequence of implied-out orders in ODP-TR follows the sequence of expiry. Implied orders of near-month will be generated first, followed by far-month implied orders. Implied orders of the same price will be aggregated and queued in the orderbook separately from explicit orders. Please refer to Example 1 in Appendix A4 for a detailed illustration on the differences between HKATS and ODP-TR.

Execution Sequence

74. In ODP-TR, explicit orders will have higher execution priority over implied orders for orders at same price level. Implied orders will only be matched after all explicit orders are exhausted.

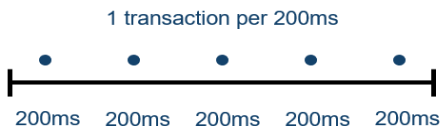
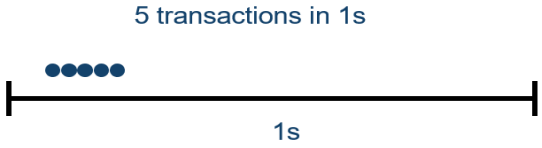
75. Further, within the aggregated implied orders, the execution follows the expiry of the parent leg, from nearest to farthest, i.e. the implied order with a parent leg of nearest expiry is executed first. Please refer to Example 2 in Appendix A4 for detailed illustration on the differences between HKATS and ODP-TR.

Non-Functional Changes

Throttle

76. To align with global trends, the throttle model will be changed from a smooth-out model to a sawtooth model.

Figure 28: Comparison of Smooth-out and Sawtooth models

HKATS	**ODP-TR**
Smooth-out model EPs need to wait 200ms to send another transaction  	Sawtooth model EPs can send 5 transactions at once (Exact number of TPS to be announced) 

Certification Test Portal

77. A new certification test portal will be introduced in ODP-TR.

78. Certification testing is conducted in an external testing environment and serves as a functional verification of an EP's or software vendor's ability to connect to ODP-TR and conduct trading activities in a compliant and orderly manner.

79. The Test Portal is a web-based application that enables EPs and software vendors to manage the execution of tests, including the following key functions:

    79.1. View the status of test cases

    79.2. Obtain the test results upon test case execution

    79.3. Submit test results online upon successful completion and verification of all test cases

    79.4. Retrieve and search historical test records using different criteria

    79.5. Submit requests for mandatory test case exemption

    79.6. Perform self-service administrative actions to trigger related test cases, such as password management and sequence number reset

80. EPs or ISV should access the test portal via SDNet / 2 testing circuit or HSTN to execute and record the results of required test cases.

SECTION IV: KEY CHANGES IN OMD-D (MARKET DATA)

81. The detailed functional changes and enhancements to be introduced in OMD-D under ODP-TR are summarized in this section. A high-level description is also available in Appendix B.

82. All of the latest updated ODP OMD-D technical documents can be found in the OMD-D web corner.

OMD-D Message Interface and Behaviour Change

Reference Data

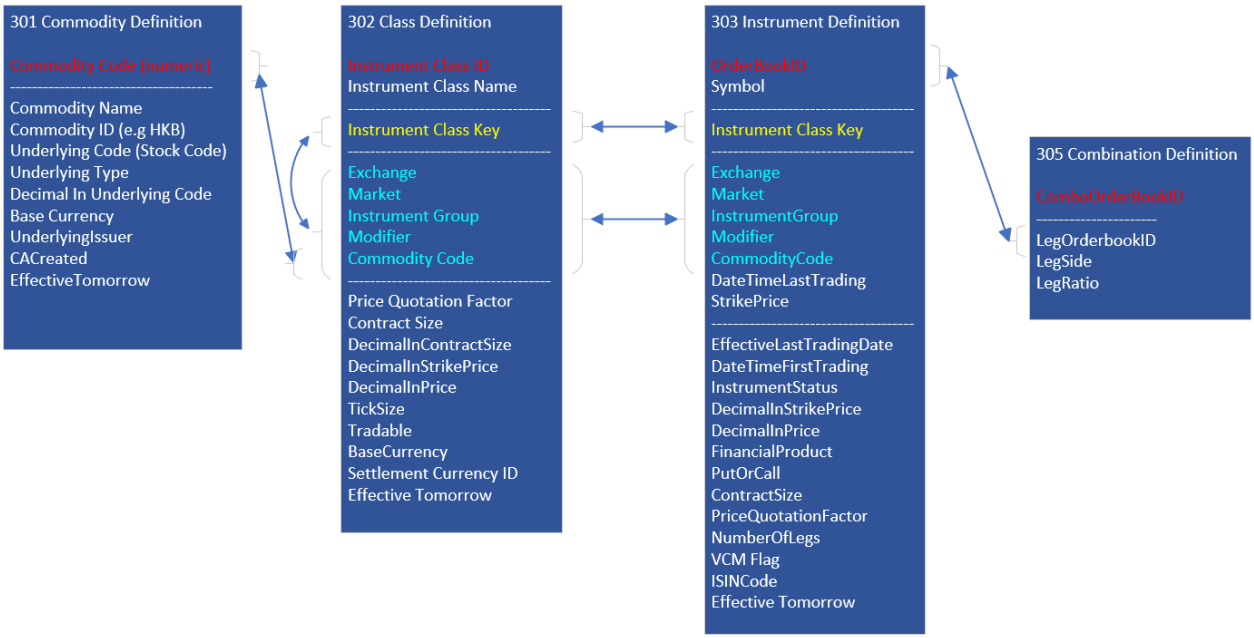
83. The existing key elements, namely Exchange, Market, Instrument Group, Modifier, Commodity Code, Last Trading Date, and Strike Price, will continue to be available in the reference data structure, in order to minimize the impact on existing applications that rely on the current instrument definition.

84. The reference data structure will become more streamlined and consistent, with clearer separation between Commodity, Class, Instrument and Combination definitions. This improvement will enhance data normalization and reduce ambiguity.

85. The new reference field “InstrumentClass Key” is introduced in the Class Definition (302) message as a short-cut key for Instrument Class. Instead of using multiple key elements, this new short-cut key can be used as an alternative in looking up a particular instrument in a more simplified and efficient way.

86. As illustrated in the diagram below, the relationship between definition messages is more structural and simplified. Data field linkages between definitions are clearly defined, enabling faster and more efficient message-based lookups.

Figure 29: OMD-D reference data structure



87. The instrument definition structure will be simplified by combining the existing Series Definition Base (303) and Series Definition Extended (304) messages into one single message, namely Instrument Definition (303) message. Some overlapped fields will also be normalised, and the structure will become more standardised. Nevertheless, some of the fundamental fields, e.g. “Instrument Group”, “Commodity Code”, “Expiration Date”, will be kept for clients to reference each instrument and minimise the change impact.

88. While almost all existing fields will be maintained, the reference data context will be enriched by introducing more fields, e.g., “Underlying Issuer” in Commodity Definition (301) message and “VCM Flag” in Instrument Definition (303) message.

Status Data

89. The Market Status (320) message will only cover the Market, Instrument Type and Instrument Class level and therefore, the concept of Instrument Session State (ISS) will no longer be applicable.

90. Instead of via Market Status (320) message, a newly introduced VCM Trigger (324) message will be disseminated when the VCM is triggered on a particular instrument. OMD-D Clients could also utilize this message to obtain VCM-related information, e.g., VCM start / end time and VCM price band, instead of referring to the content in the Market Alert (323) message.

91. A newly introduced THM Trigger (326) message will be disseminated when a Trading Halt is triggered on a particular instrument class, instead of via Market Status (320) message. OMD-D Clients could then apply the halt state to all instruments under the corresponding instrument class.

92. The above enhancements will allow clients to build more robust state-driven applications and react more precisely to volatility and trading halts, reducing the risk of misinterpreting trading availability or control mechanisms during fast-moving markets.

Order Book Data

93. Implied order is derived from normal orders, and it is always placed in the last position on each price level. ODP-TR provides the aggregate quantity of the implied orders on price level as separated information. Subject to a clients' business needs, clients may decide if it is necessary to provide the implied order information in their services.

94. To differentiate between the quantity of normal order(s) and implied order at the given price level, a new field, "AggregateImpQuantity", will be introduced in Aggregate Order Book Update (353) message. Overall, the logic of handling Aggregate Order Book Update (353) message in Derivatives Premium (DP), Derivatives Standard (DS) and Derivatives Lite (D-Lite) datafeed products remains unchanged.

95. Considering that an implied order is generated by ODP-TR, instead of inputted by the exchange participant, the implied order information will not be provided via order book-related messages, i.e., Add Order (330), Modify Order (331) and Delete Order (332) messages. To provide the same level of information on aggregate implied quantity to Derivatives FullTick (DF) clients, a new message, Aggregate Implied Quantity (337), will be specifically introduced in DF datafeed product. DF clients may consider utilizing both order book-related messages and Aggregate Implied Quantity (337) messages if they wish to build a consolidated full order book. An example of building a consolidated full order book can be found in Appendix B.

96. Unlike the full order book management in the existing version of OMD-D, Modify Order (331) and Delete Order (332) will explicitly be disseminated to indicate the changes to the orders. In OMD-D, Trade (350) message will solely be used to provide the trade information and therefore OMD-D DF Clients will not need to utilize Trade (350) message to manage the full order book when they receive this message.

Trade and Price Data

97. Trade Statistics (360) message will be disseminated on a streaming basis in DP datafeed product while it will be disseminated on a snapshot basis in DS and D-Lite datafeed products. This will align with the dissemination frequency nature of each datafeed product.

98. Data context in Trade (350) message will be reorganized and enriched, allowing OMD-D Clients to identify the trade type and the linkage of the trades more transparently.

99. The trade time precision in Trade (350) and Trade Amendment (356) messages will be enhanced.

100. A field "OrderBookID" will be newly added in the Trade Amendment (356) message, allowing OMD-D Clients to determine which instrument the trade amendment belongs to more efficiently and directly.

101. The consistency in decimal handling and field descriptions across Trade (350), Trade Statistics (360) and Calculated Opening Price (364) messages will be improved, allowing OMD-D Clients to interpret prices in a more uniform and deterministic manner.

Message Recovery Mechanism

102. Line arbitration, refresh and retransmission service will still be used in recovering the missing data, and the handling logic of all existing recovery mechanisms will remain unchanged.

Startup and Failover Process Handling

103. There will be no functional change in handling the start of day in OMD-D. Same as the current production, OMD-D Clients should use the same logic to process the Sequence Reset (100) message or obtain the latest market image from the Refresh service.

104. There will be no functional change in handling the site failover process in OMD-D. Same as the current production, OMD-D Clients should make use of the Disaster Recovery Signal (105) message to detect and execute the failover procedure.

Network Connectivity

105. In general, connectivity to OMD-D will remain unchanged from the current arrangement, i.e. via HSN or SDNet / 2 connections. Nevertheless, the multicast IP addresses and ports for the multicast channels in both Real Time and Refresh services, as well as the message coverage in each multicast channel, will have some modifications. To align with the 6 Matching Engines in ODP-TR, OMD-D will increase from the existing 3 partitions to 6 partitions. The product allocation of OMD-D partitions will be the same as that of ODP-TR Matching Engines listed in Appendix A2.

106. For details, OMD-D Clients could refer to the new OMD-D Connectivity Guide (under ODP Migration) in the OMD-D web corner.

107. There will be no change in the connectivity setup of OMD-D retransmission servers and therefore, 4 retransmission servers will still be active and available for connection in OMD-D.

108. A new OMD-D Readiness Test environment dedicated to the ODP version will be introduced for OMD-D Clients to perform testing on their newly enhanced OMD-D feed handlers. The new OMD-D Readiness Test environment will operate in the current network, and OMD-D Clients who have OMD-D testing connections are not required to do any reconfiguration with network carriers. In addition, a new OMD-D onboarding tool will be offered to OMD-D Clients who do not have OMD--D testing connections to replay the new canned data set and perform the offline testing.

109. A testing answer book will be provided for self-verification, and all OMD-D Clients are required to complete the answer book and submit the result declaration before -participating in the market rehearsals.

SECTION V: IMPLEMENTATION

Two-Staged Migration Approach

110. To mitigate migration risk, ODP will be implemented through a two-stage migration approach. In Stage 1, Post Trade functions will be migrated from DCASS to ODP-PT Following the successful completion and stabilisation of Stage 1, HKEX will proceed to Stage 2, which will migrate trading functions from HKATS to ODP-TR, with corresponding enhancements to OMD-D to align with ODP-TR.

111. As there are no functional or interface changes to ODP-PT and Risk Management functions in Stage 2, ODP-PT specific testing, rehearsal and fallback arrangements will be addressed as part of the Stage 1 implementation in the ODP Stage 1 – Post Trade and Risk Management Information Paper.

112. Participants are strongly advised to review all impacted functional areas across ODP-TR, together with their associated downstream systems and to ensure that their internal systems, workflows, and operational dependencies are fully validated during preparation and testing.

Stage 1 Migration

113. Please refer to the ODP Stage 1 – Post Trade and Risk Management Information Paper for details on the Stage 1 migration.

Stage 2 Migration

114. During Stage 2 migration, reference data (including series and broker account data) will be migrated from HKATS to ODP-TR. Login credentials for HKATS Online, OAPI, and the ODP-TR PTRM GUI will not be migrated. EPs will therefore be required to create new user accounts in ODP-TR. Details of the account creation arrangements will be provided in due course.

115. Following the completion of Stage 2 migration, derivatives trading activities will be conducted on ODP-TR, which will operate in full integration with ODP-PT. Upon completion of this stage, the HKEX derivatives market infrastructure will be fully migrated to and operating on the Orion Derivatives Platform (ODP).

116. Upon the launch of ODP Stage 2, OMD-D will be rolled out in production with the new interface and OMD-D Clients will therefore be required to use their upgraded application to receive the market data from OMD-D.

Stabilisation Period

117. A stabilisation period will be implemented following both Stage 1 and Stage 2 migration. HKEX is currently assessing the detailed arrangement to address unforeseeable incidents that may result in irrecoverable impacts to the migrated ODP systems. While the detailed fallback arrangements will be communicated in due course, EPs, CPs and OMD-D Clients are required to plan and prepare their internal procedures and operational arrangements to support system fallback.

Implementation Schedule

118. HKEX has published the ODP-TR Binary Protocol specifications and provided the ODP-TR Offline Simulators in Q3 2025 to enable EPs to plan and commence the necessary system changes for ODP-TR, or to engage their software vendors to support the required developments.

119. To further support EPs in testing their systems, the ODP-TR external testing environment will be made available for access in Q4 2026.

120. EPs, CPs and OMD-D Clients are required to validate their systems through certification testing and a market rehearsal to confirm their operational readiness. Certification testing is expected to be completed in Q4 2027 / Q1 2028, while the market rehearsal is planned for Q1 2028, subject to market readiness.

Figure 30: Stage 2 High-Level Implementation Schedule

Milestone	Indicative Timing
Provision of the ODP External Testing Environment, including ODP-TR, the uplifted OMD-D and ODP-PT	Q4 2026
Certification Test Completion	Q4 2027 / Q1 2028
Market Rehearsals	Q1 2028, subject to market readiness

121. Further details of the testing arrangements will be set out in SECTION VI: TESTING ARRANGEMENTS.

Suggested Preparation Checklist

122. EPs and OMD-D Clients are encouraged to undertake the following preparatory steps ahead of Stage 2 implementation:

122.1. Review the Information Paper and gain a clear understanding of ODP Stage 2 and its overall scope

122.2. Review of the ODP-TR Binary Protocol and Drop Copy specifications in detail

122.3. Engage internal Information Technology teams and external vendors to plan and carry out the required development

122.4. Perform an impact assessment and finalise the scope of work and resource requirements

122.5. Verify the message format, leveraging the offline simulator where appropriate to confirm compliance with specifications

122.6. Implement the required system changes and conduct end-to-end tests in the designated testing environments

122.7. Complete the certification test by the stipulated deadline to be eligible for participation in the market rehearsal

SECTION VI: TESTING ARRANGEMENTS

123. All participants, including EPs, CPs, and clients of OMD-D, are required to take part in the market wide testing and operational readiness exercises scheduled under the ODP implementation plan. These exercises are essential to verify system readiness, validate participant connectivity, and ensure operational preparedness across all involved parties.

Offline Simulation Test

124. A lightweight offline simulation tool has been provided to allow participants to perform early validation of their systems prior to connecting to the HKEX testing environments. The tool is intended to support preliminary verification of the ODP-TR Binary Protocol messages and drop copy interface.

125. A lightweight offline OMD-D simulation tool will be provided to simulate the multicast data broadcast and retransmission connection testing before connecting to the HKEX testing environments. The tool is intended to support OMD-D Clients in the development of message decoding and retransmission before the readiness test.

126. The Simulator package provides a pre-defined set of test cases for EPs and BSS Vendors to execute. It allows EPs and BSS Vendors to independently verify the message formats developed for their enhanced BSS without connecting to an HKEX testing environment.

127. During test execution, messages are exchanged between the BSS and the Simulator. The Simulator validates the messages received from the BSS and returns simulated responses from ODP-TR. The BSS is also required to process these responses and verify the resulting message processing outcomes.

External Testing Environment

128. A dedicated testing environment will be introduced to support EPs and ISVs in conducting ODP-TR testing activities.

129. The environment will:

    129.1. Operate via testing on SDNet / 2 or HSTN

    129.2. Use a separate IP address range to clearly distinguish testing activities related to HKATS vs ODP-TR

    129.3. Support functional and integration testing

    129.4. The environment is not intended for stress, load, or volume testing

    129.5. Have OMD-D available for real time data feed service

130. The dedicated testing environment provided for ODP-TR testing will operate on the same testing network as HKATS, but with a separate IP address range. Further details on network connectivity arrangements will be announced in Q3 2026.

Certification Test

131. Participants who intend to connect to ODP-TR via ODP-TR Binary Protocol are required to complete the mandatory certification test.

132. The certification process will be primarily focused on validating:

    132.1. Compliance with interface specifications

    132.2. Correctness of message formats and protocols

    132.3. Handling of mandatory business scenarios

133. The certification test scripts and certification requirements will be published in due course. Participants must successfully complete certification prior to proceeding to market rehearsals.

Market Rehearsal

134. Market rehearsals will be conducted as the final phase of readiness validation. These rehearsals will involve all market participants performing required testing and verification of their systems in the production environment.

135. Objectives include:

    135.1. Participants must validate their readiness for the ODP-TR and OMD-D go live

    135.2. Ensuring system stability under expected and stress tested volumes

    135.3. Participants must get familiar with the market open, market close, and other key operational events under Stage 2

136. Participation in market rehearsals is mandatory. Participants that do not successfully complete the market rehearsal will not be permitted to access ODP-TR under Stage 2. Market rehearsal outcomes will also form part of the overall go / no go readiness assessment for the ODP-TR rollout.

SECTION VII: DOCUMENTATION

Document Catalogue

138. HKEX has published a range of technical and information documents to support market participants in understanding the ODP changes, conducting system impact assessments, and carrying out system development, and testing activities. The key documents, release timeline, intended audience and distribution channels are summarised below.

Figure 31: ODP document catalogue

Timeline	Item	Distribution Channel	Audience
Aug 2025	ODP Preview Paper	HKEX ODP webpage	CP / EP / Vendor
	ODP-TR Binary Protocol	Electronic Communication Platform (ECP)	EP / Vendor
	ODP-TR offline simulator guide		EP / Vendor
	ODP-TR offline simulator package		EP / Vendor
	ODP-PT API	Client Connect	CP / Vendor
	ODP-PT offline simulator guide		CP / Vendor
	ODP-PT offline simulator package		CP / Vendor
Sep 2025	OMD-D Interface Specification	HKEX website	OMD-D Clients
Feb 2026	OMD-D Interface Specification	HKEX website	OMD-D Clients
	OMD-D Connectivity Guide		OMD-D Clients
	OMD-D Developers Guide		OMD-D Clients
Apr 2026	ODP Stage 1 – Post Trade and Risk Management Information Paper ODP Stage 2 – Trading Information paper	HKEX ODP webpage	CP / EP / Vendor / OMD-D Clients
	Post Trade Report Specification	Client Connect	CP / Vendor
	Risk Management Report Specification	Client Connect	CP / Vendor

139. This Information Paper is published on the ODP webpage.

140. For technical documentation, EPs may download trading-related documents via the ECP Download Corner in accordance with the prescribed access procedures, while CPs may obtain the post trade and risk-related documentation through the Client Connect Resource Area.

141. Software vendors are advised to liaise with their respective clients to obtain the necessary technical documents.

142. The latest OMD-D technical documents can be found in the OMD-D web corner.

SECTION VIII: ENQUIRIES

Contact Us

143. For queries and clarifications regarding ODP, please email ODP_Support@hkex.com.hk.

144. For future project updates, please refer to the ODP webpage on the HKEX website.

APPENDIX A: TRADING ENHANCEMENTS

145. This appendix provides detailed reference information intended to support participants in understanding how existing messages are represented under the new ODP-TR Binary Protocol, and how they align with the OAPI.

Appendix A1: Mapping between OAPI and ODP-TR Binary Protocol

146. The mapping below serves as a reference and is subject to change. The exact length and type may be different from the HKATS. For details of each field, please refer to the ODP-TR Binary Protocol specification listed in SECTION VII: DOCUMENTATION

Single Order

147. The below table lists the field mapping between ODP-TR Binary Protocol and OAPI. New fields introduced in ODP-TR are marked in bold.

Figure 32: Single order message field mapping

Mandatory / Optional field	ODP-TR Binary Protocol Field		OAPI MO31 Field
Mandatory	**Client Order ID**		
Mandatory	**Transaction Time**		
Mandatory	Security ID	<>	series
Mandatory	Side	<>	bid_or_ask_c
Mandatory	Order Type	<>	order_type_c
Mandatory	Order Qty	<>	mp_quantity_i
Mandatory	Order Price	<>	premium_i
Mandatory	LEI	<>	lei_s
Optional	Time In Force	<>	time_validity_n
Optional	SMP ID	<>	smp_token_s
Optional	**ATID**		
Optional	Position Effect	<>	open_close_req_c
Optional	Give-up Participant	<>	give_up_member_t
Optional	Give-up Information	<>	give_up_info_s
Optional	**Order Attribute Flags**		

Mandatory / Optional field	ODP-TR Binary Protocol Field		OAPI MO31 Field
Optional	**Expire Date**		
Optional	Clearing Account	<>	ex_client_s
Optional	Customer Information	<>	customer_info_s
Optional	AHT Indicator	<>	exch_order_type_n
Optional	**Cancel Hint Value**		

Fields currently in OAPI not mapped in ODP-TR Binary Protocol are listed in the below table.

Figure 33: Remaining single order fields in HKATS

OAPI MO31 Field
block_n
ext_t_state_c
stop_condition_c
total_volume_i

Single Quote

148. The below table lists the field mappings between ODP-TR Binary Protocol and OAPI. New fields introduced in ODP-TR are marked in bold.

Figure 34: Single quote message field mapping

Mandatory / Optional	ODP-TR Binary Protocol Field		OAPI MO37 Field
Mandatory	**Quote ID**		
Mandatory	**Transaction Time**		
Mandatory	Security ID	<>	series
Mandatory	Quote Entry ID	<>	order_number_bid_u, order_number_ask_u
Mandatory	Bid Price	<>	bid_premium_i
Mandatory	Bid Qty	<>	bid_quantity_i
Mandatory	Offer Price	<>	ask_premium_i
Mandatory	Offer Qty	<>	ask_quantity_i

Mandatory / Optional	ODP-TR Binary Protocol Field		OAPI MO37 Field
Mandatory	LEI	<>	lei_s
Optional	SMP ID	<>	smp_token_s
Optional	**ATID**		
Optional	Give-up Participant	<>	give_up_member_t
Optional	Give-up Information	<>	give_up_info_s
Optional	Clearing Account	<>	ex_client_s
Optional	Customer Information	<>	customer_info_s
Optional	**Bid Quote Attribute Flags**		
Optional	**Offer Quote Attribute Flags**		
Optional	**Bid Cancel Hint Value**		
Optional	**Offer Cancel Hint Value**		

Fields currently in the OAPI not mapped in ODP-TR Binary Protocol are listed in the below table.

Figure 35: Remaining single quote fields in HKATS

OAPI MO37 Field
bid_total_volume_i
ask_total_volume_i
block_n
time_validity_n
order_type_c

Mass Quote

149. The below table lists the field mappings between ODP-TR Binary Protocol and OAPI. New fields introduced in ODP-TR are marked in bold.

Figure 36: Mass quote message field mapping

Mandatory / Optional	ODP-TR Binary Protocol Field		OAPI MO93 Field	OAPI MO960 Field
Mandatory	**Quote ID**			
Mandatory	**Transaction Time**			
Mandatory	LEI	<>	lei_s	lei_s
Optional	SMP ID	<>	smp_token_s	smp_token_s
Optional	**ATID**			
Optional	**Give-up Participant**			
Optional	Give-up Information	<>	give_up_info_s	give_up_info_s
Optional	Clearing Account	<>	ex_client_s	
Optional	**Customer Information**			
Mandatory	**No Quote Entries**			
Mandatory	Security ID	<>	series	series
Mandatory	Quote Entry ID	<>	order_number_bid_u, order_number_ask_u	
Mandatory	Bid Price	<>	buy_price_i	buy_price_i
Mandatory	Bid Qty	<>	buy_quantity_u	bid_quantity_i
Mandatory	Offer Price	<>	sell_price_i	sell_price_i
Mandatory	Offer Qty	<>	sell_quantity_u	sell_quantity_i
Mandatory	**Bid Quote Attribute Flags**			
Mandatory	**Offer Quote Attribute Flags**			
Mandatory	**Bid Cancel Hint Value**			
Mandatory	**Offer Cancel Hint Value**			

Internal Block Trade

150. The below table lists the field mappings between ODP-TR Binary Protocol and OAPI. New fields introduced in ODP-TR are marked in bold.

Figure 37: Internal block trade message field mapping

Mandatory / Optional	ODP-TR Binary Protocol Field		OAPI MO76 Field	OAPI MO77 Field
Mandatory	**Trade Report ID**			
Mandatory	**Transaction Time**			
Mandatory	**Aggregated Trade**			
Mandatory	Buyer LEI	<>	lei_s	lei_s
Mandatory	Seller LEI			
Mandatory	Trade Conclusion Date Time		time_of_agreement_date_s, time_of_agreement_time_s	time_of_agreement_date_s, time_of_agreement_time_s
Optional	**Enable Price Warning**			
Optional	**Special Indicator**			
Optional	**Buyer ATID**			
Optional	**Seller ATID**			
Mandatory	**No Block Trade Legs**			
Mandatory	Block Trade Leg Security ID	<>	series	series
Mandatory	Block Trade Leg Qty	<>	mp_quantity_i	mp_quantity_i
Mandatory	Block Trade Leg Price	<>	premium_i	premium_i
Optional	Buyer Position Effect	<>	open_close_req_c	open_close_req_c
Optional	Seller Position Effect			
Optional	Buyer Give-up Participant	<>	give_up_member_t	give_up_member_t
Optional	Seller Give-up Participant			
Optional	Buyer Give-up Information	<>	give_up_info_s	give_up_info_s
Optional	Seller Give-up Information			
Optional	Buyer Clearing Account	<>	ex_client_s	ex_client_s
Optional	Seller Clearing Account			
Optional	Buyer Customer Information	<>	customer_info_s	customer_info_s
Optional	Seller Customer Information			

Fields currently in OAPI not mapped in ODP-TR Binary Protocol are listed in the below table.

Figure 38: Remaining Trade Report fields in Genim HKATS

OAPI MO76 Field	OAPI MO77 Field
block_n	ext_t_state_c
settlement_date_s	block_n
ext_t_state_c	settlement_date_s
deferred_publication_c	deferred_publication_c
party_t	party_t
smp_token_s	smp_token_s
exch_order_type_n	exch_order_type_n

Interbank Block Trade

Figure 39: Interbank block trade message field mapping

Mandatory / Optional	ODP-TR Binary Protocol Field		OAPI MO75 Field
Mandatory	**Trade Report ID**		
Mandatory	**Transaction Time**		
Mandatory	**Aggregated Trade**		
Mandatory	LEI	<>	lei_s
Mandatory	Trade Conclusion Date Time	<>	time_of_agreement_date_s, time_of_agreement_time_s
Mandatory	Counterparty EP ID	<>	party_t
Optional	**Enable Price Warning**		
Optional	**Special Indicator**		
Optional	**ATID**		
Mandatory	**No Block Trade Legs**		
Mandatory	Block Trade Leg Security ID	<>	series
Mandatory	Block Trade Leg Side	<>	bid_or_ask_c
Mandatory	Block Trade Leg Qty	<>	mp_quantity_i

Mandatory / Optional	ODP-TR Binary Protocol Field		OAPI MO75 Field
Mandatory	Block Trade Leg Price	<>	premium_i
Optional	Position Effect	<>	open_close_req_c
Optional	Give-up Participant	<>	give_up_member_t
Optional	Give-up Information	<>	give_up_info_s
Optional	Clearing Account	<>	ex_client_s
Optional	Customer Information	<>	customer_info_s

Fields currently in OAPI not mapped in ODP-TR Binary Protocol are listed in the below table.

Figure 40: Remaining MO75 fields in HKATS

OAPI MO75 Field
block_n
time_validity_n
exch_order_type_n
ext_t_state_c
order_type_c
stop_condition_c
smp_token_s
settlement_date_s
deferred_publication_c

Appendix A2: Product allocation by ODP-TR Matching Engine

151. Please note that the below is subject to change.

Figure 41: Product allocation by Matching Engine

Matching Engine	Products
ME1	[16] MHI
	[27] Dividend
	[32] OOF (HSI)
	[34] HSI
	[35] Flexible HSI
	[39] Weekly HSI New: Daily Index Options
	[51] VHS
ME2	[1] CES
	[37] Flexible HHI
	[38] HHI & MCH
	[40] OOF (HHI)
	[87] Weekly HHI
ME3	[60] Sector Index
	[83] OOF HTI
	[84] Weekly HTI
	[86] Total return index (TRI & HTI)
	New: [80] BIOTECH index future
ME5	[111] Silver USD
	[112] Silver CNH
	[115] Gold CNH
	[116] Gold USD
	[118] LME USD, IRON ORE
	[120] London Metal Mini
ME6	[24] HIBOR
	[70] RMB
	[122] CAU, CEU, CIN, CJP, MCS
	[125] UCN, UIN
	New: [117] China T Bond Future

Matching Engine	Products
ME4, 5, 6	[108] MSCI AXJ, [153] MSCI A 50, [161] MSCI USD NTR IDX FUT, [163] MSCI USD IDX FUT 4, [164] MSCI USD IDX FUT 3, [166] MSCI USD IDX FUT 1, [168] MSCI USD IDX FUT 2, [170] MSCI SGX IDX FUT
	2 - SF (Monthly) & 20 – SO (Monthly) & 18 – SO (Weekly)

Appendix A3: Arrangements of Broadcast Message

Figure 42: Arrangements of broadcast message

Message Code & Description	Related Message Code & Description	Remarks for ODP-TR
BD70 (Trade Ticker)	TR70 (Trade Ticker Query)	OMD-D only
BD71 (Amended Trade Ticker)	TR71 (Amended Trade Ticker Query)	OMD-D only
BI1 (Resumption and Suspension of Trading)	-	OMD-D only
BI41 (Instrument Status)	UQ15 (Instrument Status Query)	OMD-D only
BI81 (Market Announcement)	UQ14 (Market Announcement Query)	Binary message: News (166)
BI9 (Heartbeat)	-	Binary message: Heartbeat (0)
BO10 (Equilibrium Price)	-	OMD-D only
BO38 (Market Maker Protection Settings)	-	Binary message: MMP Triggered (184)
BO5 (Firm Order Book)	MQ8 (Active Order Query) MQ9 (System-inactivated Order Query)	Binary message: Order Accepted (27) Order Amended (28) Order Cancelled (29) Order Executed (31)
BO55 (Trade Report Notification)	MQ78 (Query Trade Reports, Unmatched) MQ80 (Query Trade Reports Counterpart)	Binary message: One-party Block Trade Submission Notification (108) One-party Block Trade Confirmation Notification (115)
BO99 (Block Transaction Response)	-	Binary message: Order Rejected (24)
BO990 (Block Transaction Response)	-	Binary message: Order Rejected (24)
BU120 (Underlying Update)	DQ120 (Underlying Query)	OMD-D only

Message Code & Description	Related Message Code & Description	Remarks for ODP-TR
BU122 (Instrument Class Update)	DQ122 (Instrument Class Query)	OMD-D only
BU124 (Instrument Series Update)	DQ124 (Instrument Series Query)	OMD-D only
BU126 (Combination Series Update)	DQ126 (Combination Series Query)	OMD-D only
BU87 (Market Maker Protection Update)	DQ87 (Market Maker Protection Query)	Binary message: MMP Parameters Ack (183)
MI4 (Quote Request)	-	Public Quote Request (73)

Appendix A4: Examples on Implied Order

152. In the examples below, Tx stands for the order placement sequence (e.g. T1 stands for the first order placed) and the Tx.y is the implied order (e.g. T1.4 is the implied order generated by T1 and T4).

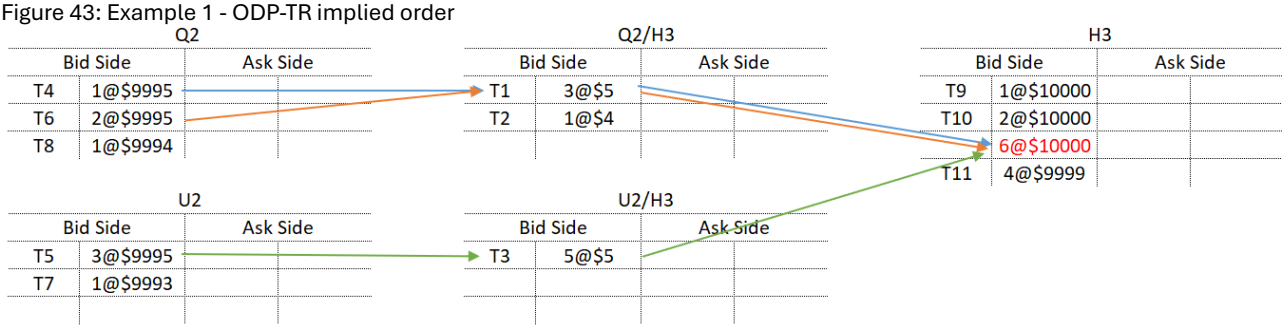
Example 1: Implied Order Generation and Aggregation

The example below illustrates that the implied orders generated in ODP-TR are based on the sequence of expiry (i.e. near-month implied orders will be generated first, followed by far-month implied orders), while the implied orders generated in HKATS follows the order placement time of the parent orders. And therefore, the implied orders of HKATS will have their own time stamp.

The implied orders generated in ODP-TR are aggregated and placed at the bottom of the order book (i.e. they are placed after the explicit orders of the same price), while the implied orders generated in HKATS will be inserted into the order book following the time sequence of the respective parent orders.

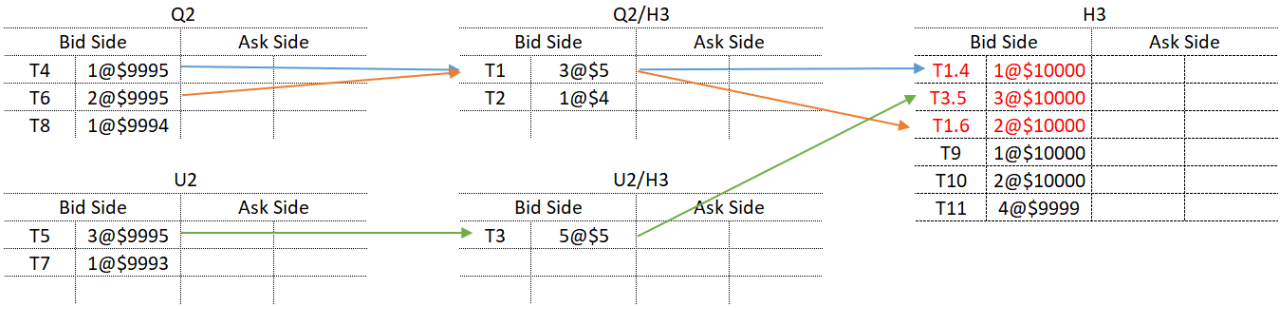
ODP-TR

Figure 43: Example 1 - ODP-TR implied order



HKATS

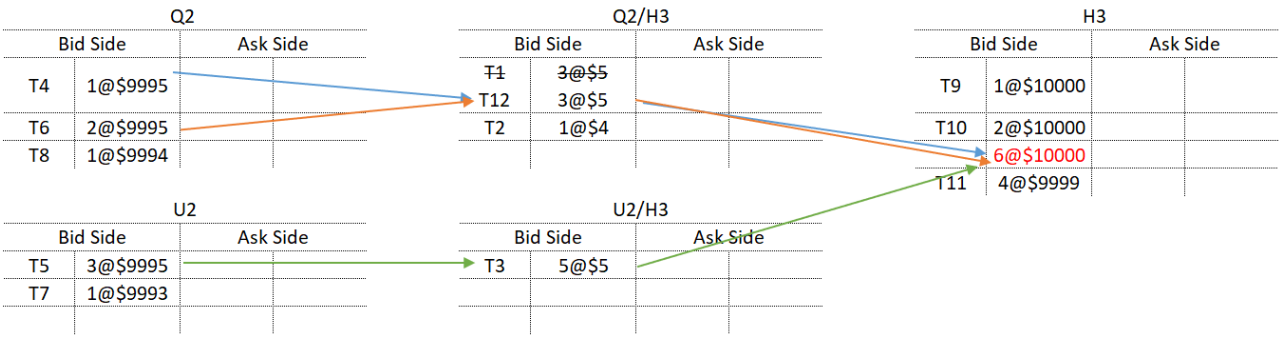
Figure 44: Example 1 - HKATS implied order



153. If order T1 is cancelled and replaced into the order book Q2/H3 again.

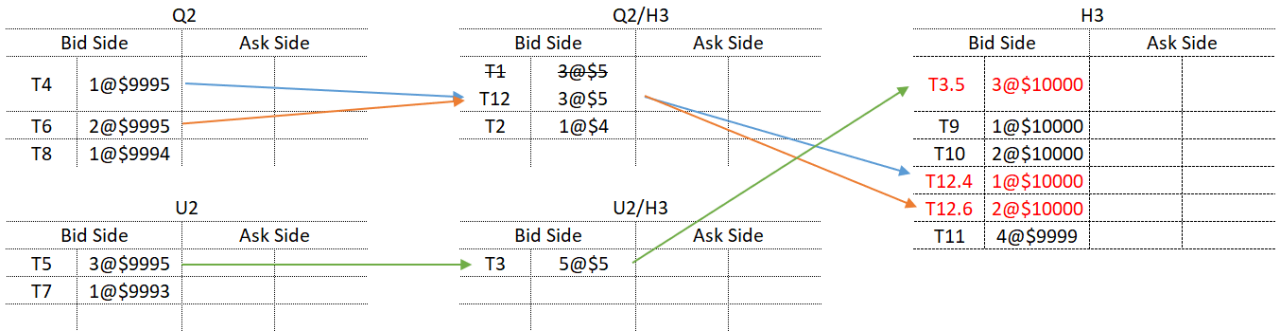
ODP-TR

Figure 45: Example 1 - ODP-TR implied order with cancel and replace



HKATS

Figure 46: Example 1 – HKATS implied order with cancel and replace



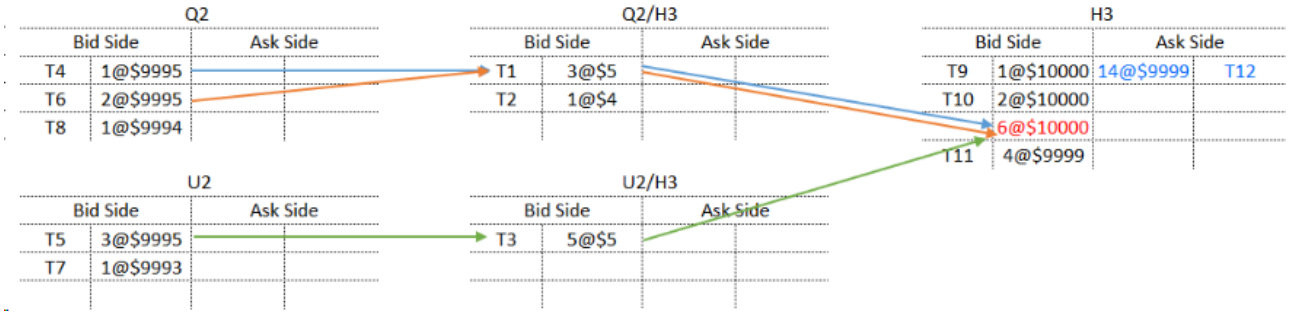
Example 2: Execution Sequence of Implied Order

The example below illustrates that implied orders in ODP-TR will only be matched after all explicit orders at the same price level have been exhausted (i.e. explicit orders always have execution priority over implied orders of the same price level). Within the aggregated implied orders, the matching sequence follows the expiry of the parent order (i.e. near-month implied orders will be executed first, followed by far-month implied orders)

The implied orders generated in HKATS will be matched in accordance with their respective time priority (i.e. for explicit and implied orders of the same price, they will be executed according to their order placement time (for explicit orders) or generation time (for implied orders)).

ODP-TR

Figure 47: Example 2 - ODP-TR implied order execution sequence



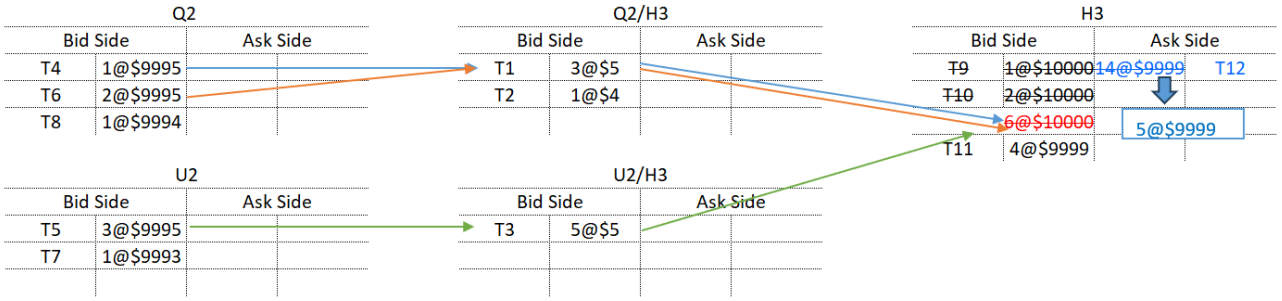
154. In the case above, when an aggressive order T12 selling 14 lots with a price of 9,999 is submitted, ODP will follow the execution sequence such that Implied orders will only be matched after all explicit orders are exhausted with match sequence as follows:

Figure 48: Example 2 - ODP-TR execution sequence

Trade Sequence	Quantity @ Price	Match Details
1	1 @ $10,000	T12 vs T9 (explicit order is matched prior to aggregated implied)
2	2 @ $10,000	T12 vs T10 (explicit order is matched prior to aggregated implied)
3	1 @ $10,000	T12 vs T1 + T4 (near-month implied-out has priority over far-month)
4	2 @ $10,000	T12 vs T1 + T6 (near-month implied-out has priority over far-month)
5	3 @ $10,000	T12 vs T3 + T5 (near-month implied-out has priority over far-month)

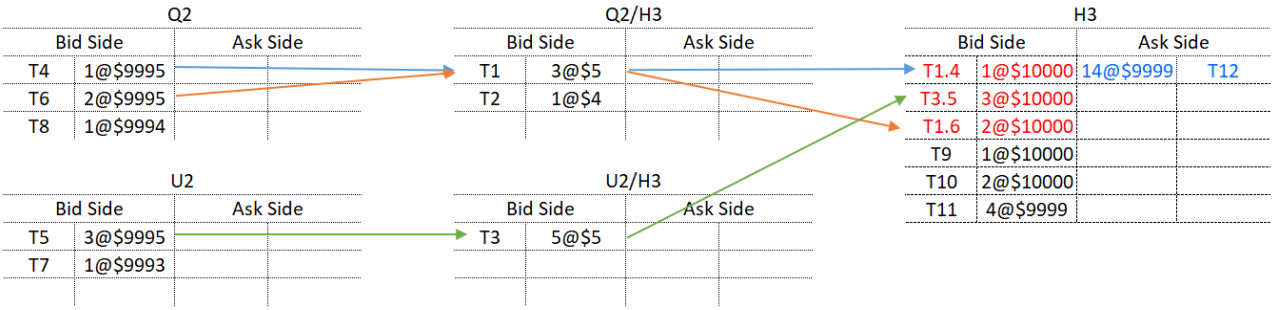
155. After the above match, 5 lots remain in order T12. With all the implied out on a price level exhausted, immediate regeneration will be triggered. Please refer to Example 3 for the continuous order regeneration and matching.

Figure 49: Example 2 - ODP-TR implied order execution sequence (continued)



HKATS

Figure 50: Example 2 – HKATS implied order execution sequence (continued)

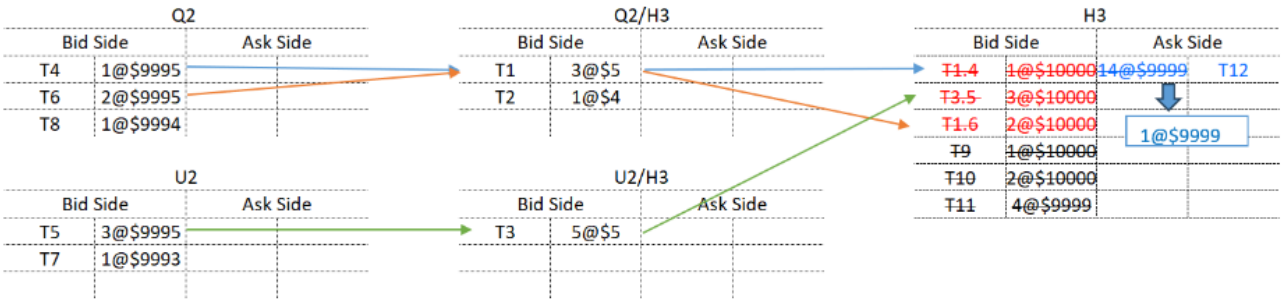


156. In the case above, when an aggressive order T12 selling 14 lots with a price of 9,999 is submitted, HKATS will follow the execution sequence as show in the above H3 order book sequence for the matching:

Figure 51: Example 2 – HKATS execution sequence

Trade Sequence	Quantity @ Price	Match Details
1	1 @ $10,000	T12 vs T1 + T4
2	3 @ $10,000	T12 vs T3 + T5
3	2 @ $10,000	T12 vs T1 + T6
4	1 @ $10,000	T12 vs T9
5	2 @ $10,000	T12 vs T10
6	4 @ $9999	T12 vs T11

Figure 52: Example 2 - HKATS implied order execution sequence



Example 3: Implied Order Regeneration Logic

For ODP-TR, implied orders are regenerated in accordance with the generation sequence described in Example 1, prioritizing contracts from the nearest expiry month to the farthest. Execution resumes only after all aggregated implied orders have been fully regenerated.

For HKATS, following the execution of an implied order, implied order regeneration is triggered immediately if the parent combination order still has remaining quantity. Once all orders are exhausted, implied orders are regenerated holistically based on the expiry sequence of the remaining leg of the combination, prioritizing contracts from the nearest expiry month to the farthest.

ODP-TR

157. Continuing with the ODP Scenario in Example 2, when orders at a price level are exhausted, implied regeneration is triggered immediately and regenerated according to the expiration date of the other leg, starting from nearest to farthest. Execution processing will be resumed after all aggregated implied orders are regenerated.

Figure 53: *Example 3 - ODP-TR implied order regeneration logic*

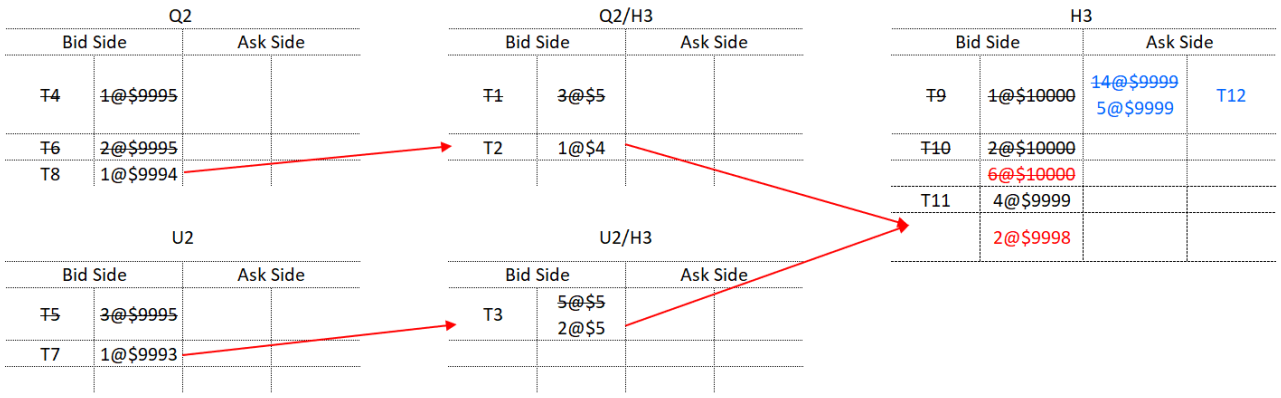
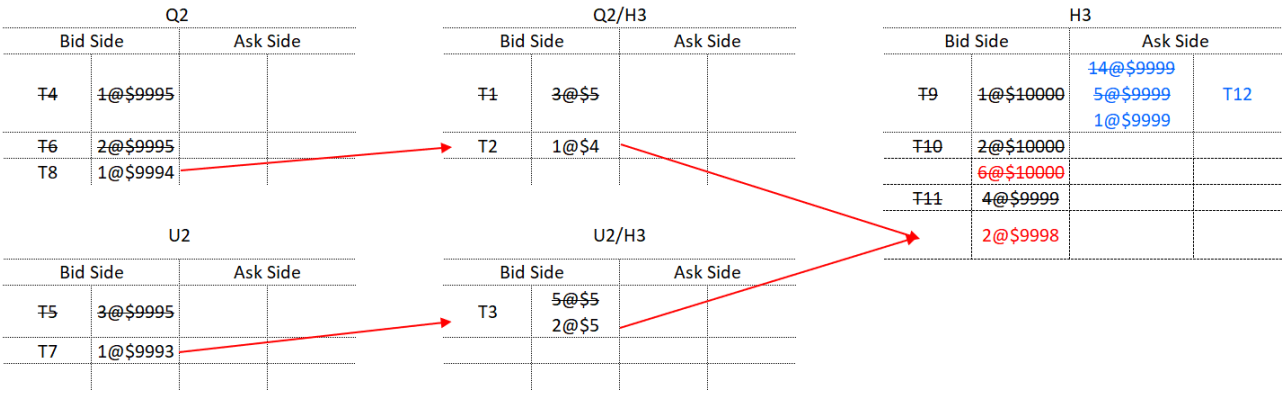


Figure 54: Example 3 - ODP-TR implied order regeneration logic match details

Trade Sequence	Quantity @ Price	Match Details
6	4 @ $9999	T12 vs T11

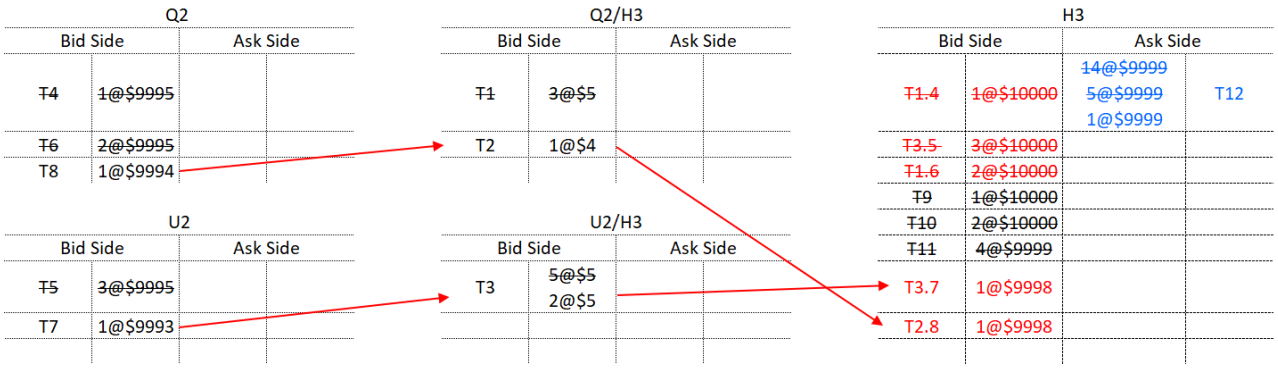
Figure 55: Example 3 - ODP-TR implied order regeneration logic (continued)



HKATS

158. Continuing with the HKATS scenario in Example 2, following the execution of an implied order, implied order regeneration is triggered immediately if the parent combination order still has remaining quantity (i.e. the implied order T3.7 is regenerated shortly after T3.5 is executed before the execution of T1.6, T9, T10 and T11). When all the matchable orders of T12 are exhausted (i.e. until matched with T11), implied orders are regenerated holistically based on the expiry sequence of the combination related to H3 (e.g. combination Q2/H3, hence the implied order T2.8 is generated). Execution resumes only after all implied order regeneration processes are completed.

Figure 56: Example 3 - HKATS implied order regeneration logic (continued)



Example 4: Implied Order Behaviour handling aggressive FoK order

Below illustrates the difference between ODP-TR and HKATS in terms of FoK order handling.

For an aggressive FoK order in ODP-TR, only the current aggregated implied and explicit quantity available in the order book is considered for matching, it won't foresee the implied orders regeneration.

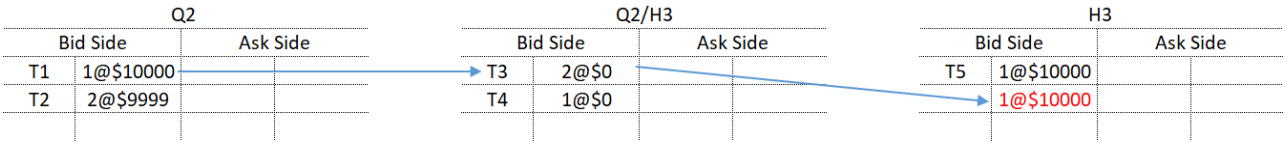
For an aggressive FoK order in HKATS, the system anticipates implied order regeneration based on the best available combination parent order. Regenerated implied orders are considered when determining whether the FoK order can be fully matched.

ODP-TR

159. In ODP, only the current aggregated quantity in the order book is considered for aggressive Fill or Kill (FoK) order matches. Implied orders from order regeneration are not considered.

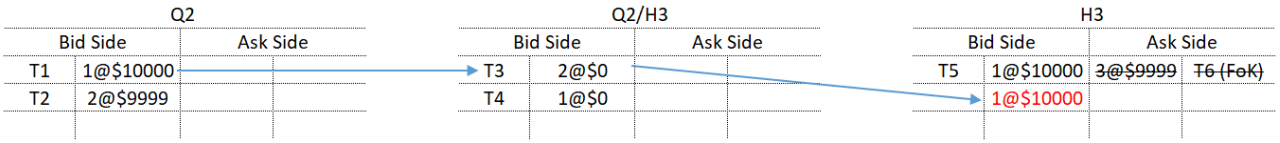
160. In the following example, the available quantity for FoK is 2.

Figure 57: Example 4 - ODP-TR implied order FOK handling



161. When an aggressive FoK order (T6) comes in with size 3, it can't be matched and is eventually deleted.

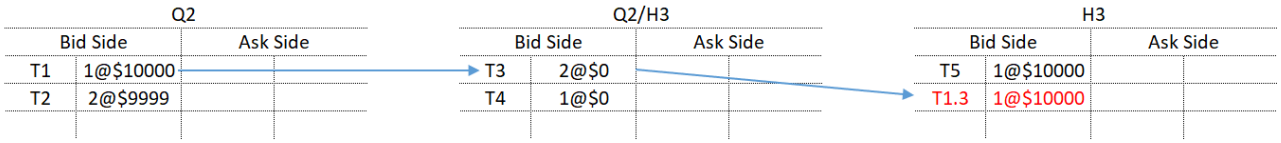
Figure 58: Example 4 - ODP-TR implied order FOK handling (continued)



HKATS

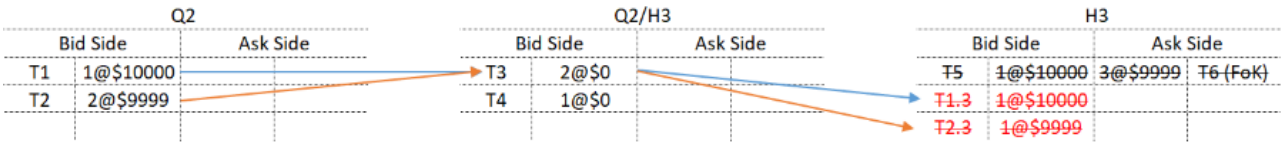
162. In HKATS, regeneration of implied orders will be considered for aggressive FoK order matching.

Figure 59: Example 4 - HKATS implied order FOK handling



163. When the aggressive FoK with size 3 (T6) comes in, it can be fully matched.

Figure 60: Example 4 - HKATS implied order FOK handling (continued)



APPENDIX B: MARKET DATA ENHANCEMENTS

High-Level Functional Changes and Enhancements in OMD-D

Figure 61: OMD-D Enhancements

Category	Enhancement / Change Description
Reference Data	• Streamlined structure with clearer separation of definitions • Introduction of *InstrumentClassKey* for consistency • Relationship between definition messages is more structural and simplified • Simplified instrument definition; enriched context with new fields
Status Data	• Market Status scope reduced to Market / Class level • New messages for VCM and Trading Halt Trigger for precise state handling
Order Book Data	• Added a new field for aggregate implied quantity in the existing aggregate order book update message in D-Lite, DS and DP • New message for aggregate implied quantity in DF feed • Explicit Modify / Delete order dissemination, instead of using Trade message to manage full order book
Trade and Price Data	• Trade statistics dissemination aligned by product • Enriched trade context • Improved trade time precision • Added *OrderBookID* in trade amendments message • Standardized decimal handling
Recovery Mechanism	• Existing recovery logic remains unchanged
Startup and Failover Process	• No functional changes; same handling for start-of-day and failover using existing messages
Network Connectivity	• Extends from 3 partitions to 6 partitions • Updates to multicast IPs, ports, and message coverage in multicast channels • Retransmission server setup unchanged

Example of Building a Consolidated Full Order Book

Full Normal Order Book

164. Built by Add Order (330) / Modify Order (331) / Delete Order (332) messages

Figure 62: Consolidated Full Order Book example

Bid			Ask		
Order #	Quantity	Price	Price	Quantity	Order #
1	2	9999	10000	7	1
2	3	9999	10005	2	2
3	5	9999	10005	1	3
4	1	9998	10005	1	4
5	1	9998	10005	3	5
6	2	9998	10005	2	6
7	1	9998	10005	1	7
8	4	9997	10005	4	8
9	1	9997	10006	2	9
10	5	9992			
11	6	9991			

Implied Order Book

165. Built by Aggregate Implied Quantity (337) message

Figure 63: Implied Order Book example

Bid		**Ask**	
Aggregate Quantity	**Price**	**Price**	**Aggregate Quantity**
15	9999	10000	7
8	9998	10001	9
5	9996	10003	6
10	9995	10005	4
		10006	8

Consolidated Order Book

Figure 64: Consolidated order book example

Bid			Ask		
Order #	**Quantity**	**Price**	**Price**	**Quantity**	**Order #**
1	2	9999	10000	7	1
2	3	9999	10000	7	Implied
3	5	9999	10001	9	Implied
Implied	15	9999	10003	6	Implied
4	1	9998	10005	2	2
5	1	9998	10005	1	3
6	2	9998	10005	1	4
7	1	9998	10005	3	5
Implied	8	9998	10005	2	6
8	4	9997	10005	1	7
9	1	9997	10005	4	8
Implied	5	9996	10005	4	Implied
Implied	10	9995	10006	2	9
10	5	9992	10006	8	Implied
11	6	9991			

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