CONNECTIVITY GUIDE

HKEX Orion Market Data Platform
Derivatives Market Datefeed Products (OMD-D)

Version 1.7
22 January 2016

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DOCUMENT HISTORY

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1.0	2 August 2013	First issue
1.1	2 January 2014	Section 2.1.1, 2.1.2 – Remove channel assignment for Derivatives Non-SOM Trade Statistics Supplement Channel Section 2.1.3, 2.1.4 – Remove channel assignment for Derivatives Non-SOM Series Statistics Supplement Channel Section 2.2 – Add elaboration on availability of OMD-D Test Environments Section 2.2.1 to 2.2.8 – Update channel assignments Section 2.2.9 – Update IP unicast addresses Section 3.2.1, 3.2.2 – Update table for bandwidth requirements Section 3.4 – Update examples Section 3.5 – Add clarification for High Performance Option Appendix B – Update the sample for Host End Network Information
1.2	17 January 2014	Section 2.1.1 to 2.1.4 and 2.2.1 to 2.2.4 – Update channel assignments for Open Interest Channel Section 2.1.7, 2.1.8, 2.2.7, 2.2.8 – Rename OMD Derivatives Trade Tick to OMD Derivatives Trade Section 2.2.9 – Update IP unicast addresses
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1.5	20 Oct 2015	Section 3.2.1 – Update bandwidth requirements Section 3.3 - Remove obsolete condition Section 3.4 – Updated examples Section 3.5 – Add clarification statement for HPO
1.6	15 December 2015	Appendix A – SDNet/2 Accredited Vendors Information
1.7	22 January 2016	Section 2 (across sub-sections) – Add information on the new dedicated channel for the new Disaster Recovery Signal (105) message

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1. Overview

This document aims to provide network configuration information and guidance to assist information vendors and end-users ("clients") in setting up their networks for making connection to OMD-D testing and production environments.

This document contains:

- Configuration information, i.e. IP addresses of the channels assigned for each of the OMD datafeed products in OMD Production environment and Open/Readiness Test environment
- Guidelines / policies for SDNet/2 and HSN connection

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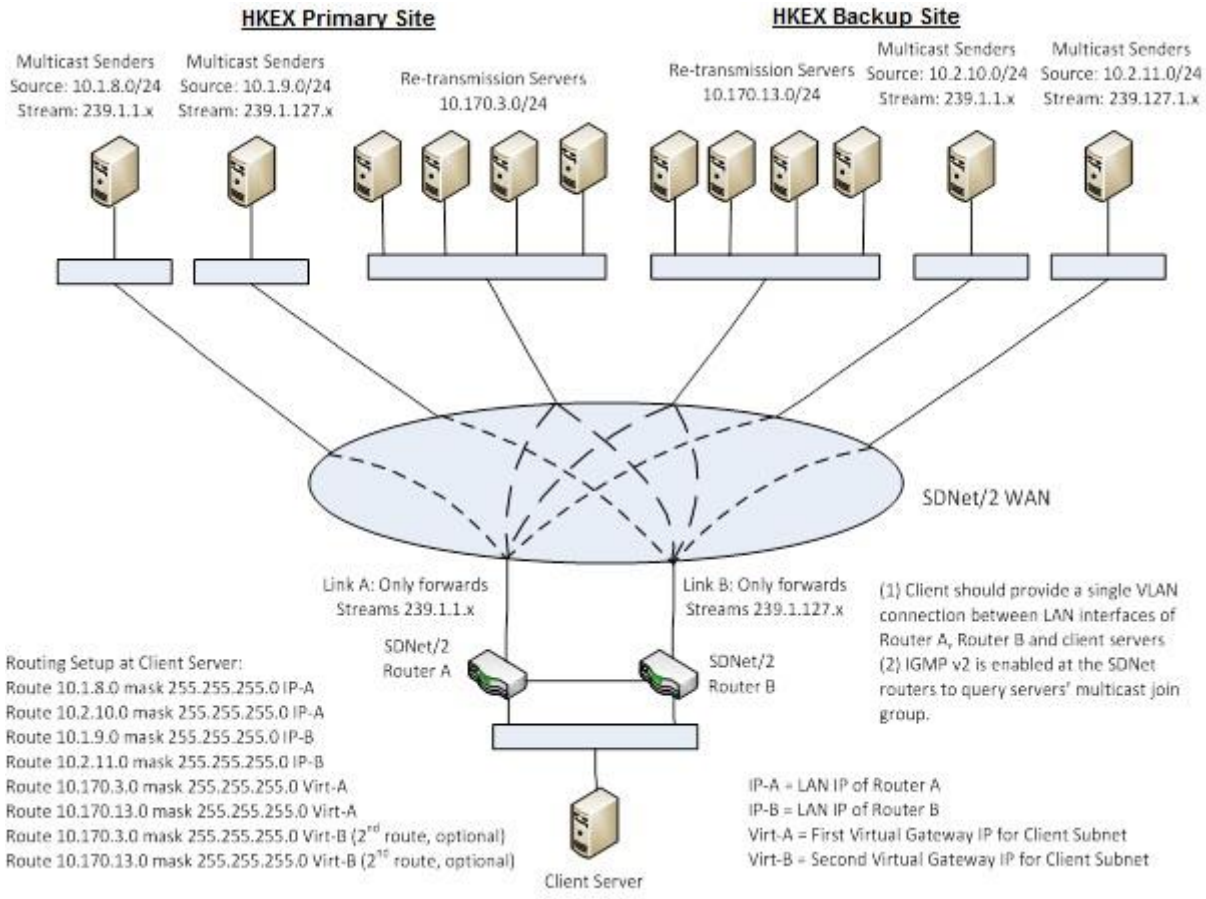
2. Configuration Information

OMD adopts multicast transmission protocol for real-time data transmission with retransmission recovery service running on Unicast. Clients are required to set correct network configurations in order to establish proper connection to the corresponding OMD multicast server and retransmission server. Below is a sample connection diagram which provides an overview of SDNet/2 network connection to OMD for reference.



For OMD connection via SDNet/2, a client system has to set up routing to the HKEX host subnets as the diagram depicted. To receive multicast stream, IGMP version 2 is employed at the SDNet/2 routers to query the multicast groups which the client system subscribes. The client system should enable the IGMP function and issue join messages to the SDNet/2 routers for the entitled multicast groups.

For OMD connection by co-location at HKEX Host Data Centre (HDC), clients are required to provide their own routers to connect to the HKEX network. The protocols used in HDC network are BGP4 and Multicast PIM sparse mode. For details, please refer to the Interface Specification on Connectivity Services and Timing Service of HKEX Hosting or contact HKEX Hosting Services team via email hostingservices@hkex.com.hk .

Since the physical speed of an SDNet/2 circuit is 1Gbps, the interface of a client end LAN switch and the client end server has to be 1Gbps in order to prevent packet drops in case of multicast packet burst. To connect with SDNet/2 routers, interface of the LAN switch should be configured with speed as “auto-sense” and duplex mode as “auto-sense” and “auto-negotiation”. Then, when the link comes up, the corresponding interface of the LAN switch should learn 1Gbps and full duplex.

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The client systems are required to subscribe to the multicast addresses and port IDs for the subscribed OMD products according to multicast channel subscriptions as listed in Section 2.1 for production environment or as listed in Section 2.2 for Open/Readiness Test environment. Clients should not subscribe to other multicast addresses and port IDs not specified in this Connectivity Guide, otherwise it will result in receiving non OMD packets.

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2.1 OMD-D Production Environment Connectivity Details

Note 1 :

In OMD-D, partition assignment follows the exact arrangement in Genium. Market numbers 1 to 20 are assigned to Partition 1, and the market number above 20 are assigned to Partition 2.

Partition Number	Markets ID
1	1 – 20
2	21 - 255

The above partitioning is subject to change by market operation development.

Note 2:

The below glossary applies to the following sections

SOM	Stock Option Market
Non-SOM	Non-Stock Option Market
EAS	Estimated Average Settlement
COP	Calculated Opening Price

2.1.1 OMD Derivatives Standard (non-SOM) (conflated)

		Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	101	A: 239.1.1.128:51001 B: 239.1.127.128:51001	601	A: 239.1.1.153:51001 B: 239.1.127.153:51001
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	201	A: 239.1.1.128:51002 B: 239.1.127.128:51002	701	A: 239.1.1.153:51002 B: 239.1.127.153:51002
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	151	A: 239.1.1.128:51003 B: 239.1.127.128:51003	651	A: 239.1.1.153:51003 B: 239.1.127.153:51003
Derivatives Non-SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	161	A: 239.1.1.128:51004 B: 239.1.127.128:51004	661	A: 239.1.1.153:51004 B: 239.1.127.153:51004
Derivatives Non-SOM Quote Request Channel	Quote Request (336)	164	A: 239.1.1.128:51005 B: 239.1.127.128:51005		
Non-SOM Open Interest Channel	Open Interest (366)	191	A: 239.1.1.150:51000 B:	691	A: 239.1.1.175:51000 B: 239.1.127.175:51000

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			239.1.127.150:51000		
Derivatives Non-SOM Level 2 Price and COP (Partition 1) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353)	134	A: 239.1.1.132:51001 B: 239.1.127.132:51001	634	A: 239.1.1.157:51001 B: 239.1.127.157:51001
Derivatives Non-SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353)	234	A: 239.1.1.132:51002 B: 239.1.127.132:51002	734	A: 239.1.1.157:51002 B: 239.1.127.157:51002
Derivatives Non-SOM Trade Statistic Channel	Trade Statistic (360)	171	A: 239.1.1.132:51003 B: 239.1.127.132:51003	671	A: 239.1.1.157:51003 B: 239.1.127.157:51003
Derivatives Non-SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.144:51000 B: 239.1.127.144:51000	677	A: 239.1.1.169:51000 B: 239.1.127.169:51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.143:51000 B: 239.1.127.143:51000	699	A: 239.1.1.168:51000 B: 239.1.127.168:51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.144:51006 B: 239.1.127.144:51006		

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2.1.2 OMD Derivatives Standard (SOM) (conflated)

		Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**
Derivatives SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	102	A: 239.1.1.133:51001 B: 239.1.127.133:51001	602	A: 239.1.1.158:51001 B: 239.1.127.158:51001
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	202	A: 239.1.1.133:51002 B: 239.1.127.133:51002	702	A: 239.1.1.158:51002 B: 239.1.127.158:51002
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	152	A: 239.1.1.133:51003 B: 239.1.127.133:51003	652	A: 239.1.1.158:51003 B: 239.1.127.158:51003
Derivatives SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	162	A: 239.1.1.133:51004 B: 239.1.127.133:51004	662	A: 239.1.1.158:51004 B: 239.1.127.158:51004
Derivatives SOM Quote Request Channel	Quote Request (336)	165	A: 239.1.1.133:51005 B: 239.1.127.133:51005		
SOM Open Interest Channel	Open Interest (366)	192	A: 239.1.1.149:51000 B: 239.1.127.149:51000	692	A: 239.1.1.174:51000 B: 239.1.127.174:51000
Derivatives SOM Level 2 Price and COP (Partition 1) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353)	135	A: 239.1.1.137:51001 B: 239.1.127.137:51001	635	A: 239.1.1.162:51001 B: 239.1.127.162:51001
Derivatives SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353)	235	A: 239.1.1.137:51002 B: 239.1.127.137:51002	735	A: 239.1.1.162:51002 B: 239.1.127.162:51002
Derivatives SOM Trade Statistic Channel	Trade Statistic (360)	172	A: 239.1.1.137:51003 B: 239.1.127.137:51003	672	A: 239.1.1.162:51003 B: 239.1.127.162:51003
Derivatives SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.144:51000 B: 239.1.127.144:51000	677	A: 239.1.1.169:51000 B: 239.1.127.169:51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.143:51000 B: 239.1.127.143:51000	699	A: 239.1.1.168:51000 B: 239.1.127.168:51000

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Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.144:51006 B: 239.1.127.144:51006

2.1.3 OMD Derivatives Premium (non-SOM) (streaming)

		Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	101	A: 239.1.1.128:51001 B: 239.1.127.128:51001	601	A: 239.1.1.153:51001 B: 239.1.127.153:51001
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	201	A: 239.1.1.128:51002 B: 239.1.127.128:51002	701	A: 239.1.1.153:51002 B: 239.1.127.153:51002
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	151	A: 239.1.1.128:51003 B: 239.1.127.128:51003	651	A: 239.1.1.153:51003 B: 239.1.127.153:51003
Derivatives Non-SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	161	A: 239.1.1.128:51004 B: 239.1.127.128:51004	661	A: 239.1.1.153:51004 B: 239.1.127.153:51004
Derivatives Non-SOM Quote Request Channel	Quote Request (336)	164	A: 239.1.1.128:51005 B: 239.1.127.128:51005		
Non-SOM Open Interest Channel	Open Interest (366)	191	A: 239.1.1.150:51000 B: 239.1.127.150:51000	691	A: 239.1.1.175:51000 B: 239.1.127.175: 51000
Derivatives Non-SOM Level 2 Price and COP (Partition 1) **Channel**	Calculated Opening Price (364) Aggregate Order Book Update (353) Trade (350)	131	A: 239.1.1.131:51001 B: 239.1.127.131:51001	631	A: 239.1.1.156:51001 B: 239.1.127.156:51001
Derivatives Non-SOM Level 2 Price and COP (Partition 2)	Calculated Opening Price (364) Aggregate Order	231	A: 239.1.1.131:51002 B: 239.1.127.131:51002	731	A: 239.1.1.156:51002 B: 239.1.127.156:51002

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Channel	Book Update (353) Trade (350)				
Derivatives Non-SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	167	A: 239.1.1.139:51000 B: 239.1.127.139:51000		
Derivatives Non-SOM Series Statistic Channel	Series Statistics (363)	174	A: 239.1.1.131:51003 B: 239.1.127.131:51003	674	A: 239.1.1.156:51003 B: 239.1.127.156:51003
Derivatives Non-SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.144:51000 B: 239.1.127.144:51000	677	A: 239.1.1.169:51000 B: 239.1.127.169:51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.143:51000 B: 239.1.127.143:51000	699	A: 239.1.1.168:51000 B: 239.1.127.168:51000
Implied Volatility Channel	Implied Volatility (367)	194	A: 239.1.1.141:51000 B: 239.1.127.141:51000	694	A: 239.1.1.166:51000 B: 239.1.127.166:51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.144:51006 B: 239.1.127.144:51006		

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2.1.4 OMD Derivatives Premium (SOM) (streaming)

		Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**
Derivatives SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	102	A: 239.1.1.133:51001 B: 239.1.127.133:51001	602	A: 239.1.1.158:51001 B: 239.1.127.158:51001
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	202	A: 239.1.1.133:51002 B: 239.1.127.133:51002	702	A: 239.1.1.158:51002 B: 239.1.127.158:51002
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	152	A: 239.1.1.133:51003 B: 239.1.127.133:51003	652	A: 239.1.1.158:51003 B: 239.1.127.158:51003
Derivatives SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	162	A: 239.1.1.133:51004 B: 239.1.127.133:51004	662	A: 239.1.1.158:51004 B: 239.1.127.158:51004
Derivatives SOM Quote Request Channel	Quote Request (336)	165	A: 239.1.1.133:51005 B: 239.1.127.133:51005		
SOM Open Interest Channel	Open Interest (366)	192	A: 239.1.1.149:51000 B: 239.1.127.149:51000	692	A: 239.1.1.174:51000 B: 239.1.127.174:51000
Derivatives SOM Level 2 Price and COP (Partition 1) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353) Trade (350)	132	A: 239.1.1.136:51001 B: 239.1.127.136:51001	632	A: 239.1.1.161:51001 B: 239.1.127.161:51001
Derivatives SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353) Trade (350)	232	A: 239.1.1.136:51002 B: 239.1.127.136:51002	732	A: 239.1.1.161:51002 B: 239.1.127.161:51002
Derivatives SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	168	A: 239.1.1.140:51000 B: 239.1.127.140:51000		

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Derivatives SOM Series Statistic Channel	Series Statistics (363)	175	A: 239.1.1.136:51003 B: 239.1.127.136:51003	675	A: 239.1.1.161:51003 B: 239.1.127.161:51003
Derivatives SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.144:51000 B: 239.1.127.144:51000	677	A: 239.1.1.169:51000 B: 239.1.127.169:51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.143:51000 B: 239.1.127.143:51000	699	A: 239.1.1.168:51000 B: 239.1.127.168:51000
Implied Volatility Channel	Implied Volatility (367)	195	A: 239.1.1.142:51000 B: 239.1.127.142:51000	695	A: 239.1.1.167:51000 B: 239.1.127.167:51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.144:51006 B: 239.1.127.144:51006		

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2.1.5 OMD Derivatives Full Tick (non-SOM) (streaming)

		Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	101	A: 239.1.1.128:51001 B: 239.1.127.128:51001	601	A: 239.1.1.153:51001 B: 239.1.127.153:51001
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	201	A: 239.1.1.128:51002 B: 239.1.127.128:51002	701	A: 239.1.1.153:51002 B: 239.1.127.153:51002
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	151	A: 239.1.1.128:51003 B: 239.1.127.128:51003	651	A: 239.1.1.153:51003 B: 239.1.127.153:51003
Derivatives Non-SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	161	A: 239.1.1.128:51004 B: 239.1.127.128:51004	661	A: 239.1.1.153:51004 B: 239.1.127.153:51004
Derivatives Non-SOM Quote Request Channel	Quote Request (336)	164	A: 239.1.1.128:51005 B: 239.1.127.128:51005		
Derivatives Non-SOM Order, COP and Trade (Partition 1)	Calculated Opening Price (364) Add Order (330) Modify Order (331) Delete Order (332) Orderbook Clear (335) Trade (350)	121	A: 239.1.1.130:51001 B: 239.1.127.130:51001	621	A: 239.1.1.155:51001 B: 239.1.127.155:51001
Derivatives Non-SOM Order, COP and Trade (Partition 2)	Calculated Opening Price (364) Add Order (330) Modify Order (331) Delete Order (332) Orderbook Clear	221	A: 239.1.1.130:51002 B: 239.1.127.130:51002	721	A: 239.1.1.155:51002 B: 239.1.127.155:51002

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	(335) Trade (350)				
Derivatives Non-SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	167	A: 239.1.1.139:51000 B: 239.1.127.139:51000		
Derivatives Non-SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.144:51000 B: 239.1.127.144:51000	677	A: 239.1.1.169:51000 B: 239.1.127.169:51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.144:51006 B: 239.1.127.144:51006		

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2.1.6 OMD Derivatives Full Tick (SOM) (streaming)

		Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**
Derivatives SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	102	A: 239.1.1.133:51001 B: 239.1.127.133:51001	602	A: 239.1.1.158:51001 B: 239.1.127.158:51001
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	202	A: 239.1.1.133:51002 B: 239.1.127.133:51002	702	A: 239.1.1.158:51002 B: 239.1.127.158:51002
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	152	A: 239.1.1.133:51003 B: 239.1.127.133:51003	652	A: 239.1.1.158:51003 B: 239.1.127.158:51003
Derivatives SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	162	A: 239.1.1.133:51004 B: 239.1.127.133:51004	662	A: 239.1.1.158:51004 B: 239.1.127.158:51004
Derivatives SOM Quote Request Channel	Quote Request (336)	165	A: 239.1.1.133:51005 B: 239.1.127.133:51005		
Derivatives SOM Order, COP and Trade (Partition 1)	Calculated Opening Price (364) Add Order (330) Modify Order (331) Delete Order (332) Orderbook Clear (335) Trade (350)	122	A: 239.1.1.135:51001 B: 239.1.127.135:51001	622	A: 239.1.1.160:51001 B: 239.1.127.160:51001
Derivatives SOM Order, COP and Trade (Partition 2)	Calculated Opening Price (364) Add Order (330) Modify Order (331) Delete Order (332) Orderbook Clear (335) Trade (350)	222	A: 239.1.1.135:51002 B: 239.1.127.135:51002	722	A: 239.1.1.160:51002 B: 239.1.127.160:51002

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Derivatives SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	168	A: 239.1.1.140:51000 B: 239.1.127.140:51000		
Derivatives SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.144:51000 B: 239.1.127.144:51000	677	A: 239.1.1.169:51000 B: 239.1.127.169:51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.144:51006 B: 239.1.127.144:51006		

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2.1.7 OMD Derivatives Trade (non-SOM) (streaming)

		Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**
Derivatives Non-SOM Trade Channel (Partition 1)	Trade (350)	111	A: 239.1.1.129:51001 B: 239.1.127.129:51001		
Derivatives Non-SOM Trade Channel (Partition 2)	Trade (350)	211	A: 239.1.1.129:51002 B: 239.1.127.129:51002		
Derivatives Non-SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	167	A: 239.1.1.139:51000 B: 239.1.127.139:51000		

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2.1.8 OMD Derivatives Trade (SOM) (streaming)

		Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**
Derivatives SOM Trade Channel (Partition 1)	Trade (350)	112	A: 239.1.1.134:51001 B: 239.1.127.134:51001		
Derivatives SOM Trade Channel (Partition 2)	Trade (350)	212	A: 239.1.1.134:51002 B: 239.1.127.134:51002		
Derivatives SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	168	A: 239.1.1.140:51000 B: 239.1.127.140:51000		

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2.1.9 HKEX OMD Retransmission Unicast Connectivity

HKEX provides a Retransmission Service to its OMD clients to recover lost multicast packet. Functional details of the Retransmission Service are provided in the Interface Specification. Find below the Unicast Addresses to connect to the OMD Retransmission Servers in **OMD-D production environment**.

Retransmission Server	IP Unicast Address
Primary server in primary site	10.170.3.121:55455
Secondary server in primary site	10.170.3.122:55455
Primary server in DR site	10.170.13.121:55455
Secondary server in DR site	10.170.13.122:55455

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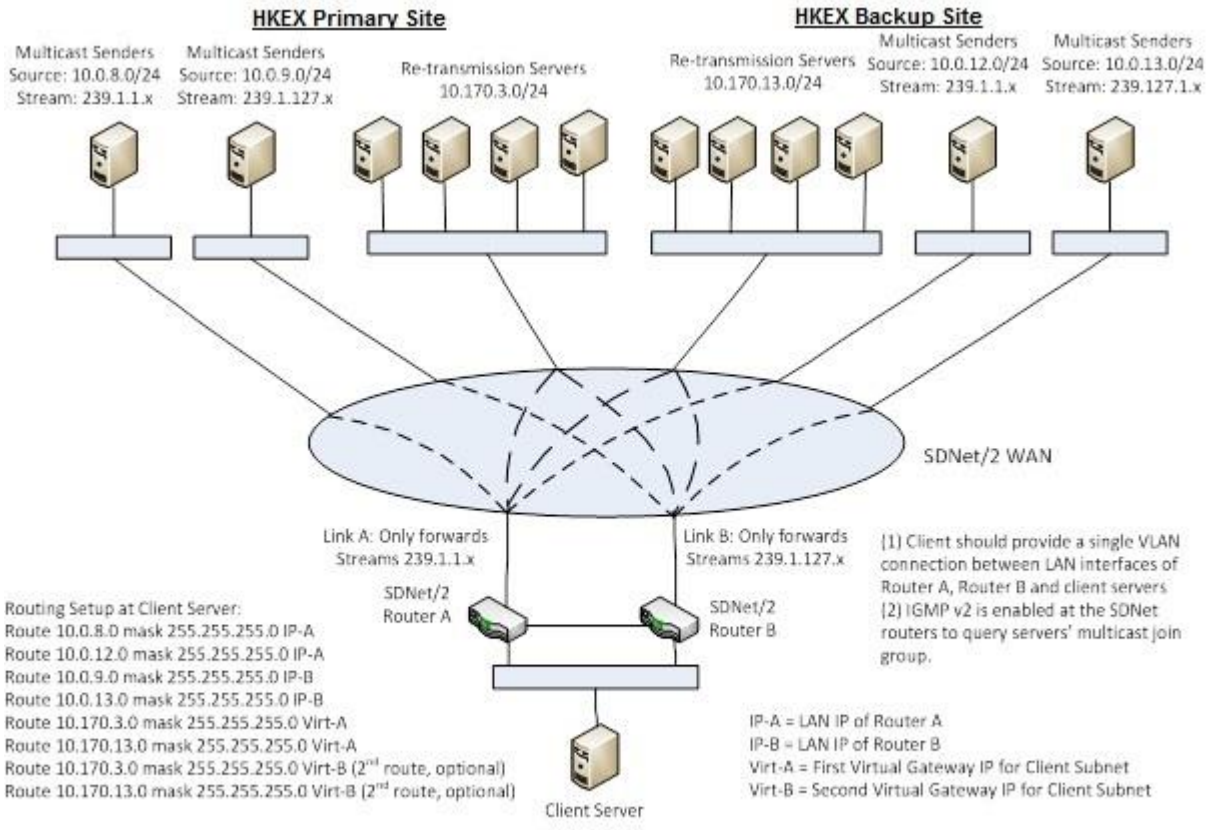
2.2 OMD-D Test Environment Connectivity Details

There are two OMD-D Test Environments available:

1. **OMD-D Readiness Test Environment ("OMD-D RT Environment")**
   - For OMD-D clients to perform OMD-D Readiness Test. OMD-D Open Test Session and Practice Session are also available in this environment for clients to prepare for the Readiness Test.
2. **OMD-D and HKATS Loop Test Environment ("HKATS Test Environment")**
   - Same as the HKATS OAPI Development Environment. OMD-D is available in this environment to enable OMD-D EP clients to perform loop test with the HKATS, the HKEX Derivatives Market Trading System.

For OMD-D Test Environments, the network configuration is basically the same as the Production Environment described in session 2.1 except that the multicast source IP segments are 10.0.8.0/24, 10.0.9.0/24, 10.0.12.0/24 and 10.0.13.0/24. The diagram of the network is shown below:



Network Configuration for Open Test Environment

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2.2.1 OMD Derivatives Standard (non-SOM) (conflated)

		Real-time Market Data Services			Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**		**Channel ID**	**Multicast Channel Subscriptions**
			HKATS Testing Environment	**OMD-D RT Environment**		**HKATS Testing Environment**	**OMD-D RT Environment**
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	101	A: 239.1.1.218: 51001 B: 239.1.127.218: 51001	A: 239.1.1.180: 51001 B: 239.1.127.180: 51001	601	A: 239.1.1.239: 51001 B: 239.1.127.239: 51001	A: 239.1.1.201: 51001 B: 239.1.127.201: 51001
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	201	A: 239.1.1.218: 51002 B: 239.1.127.218: 51002	A: 239.1.1.180: 51002 B: 239.1.127.180: 51002	701	A: 239.1.1.239: 51002 B: 239.1.127.239: 51002	A: 239.1.1.201: 51002 B: 239.1.127.201: 51002
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	151	A: 239.1.1.218: 51003 B: 239.1.127.218: 51003	A: 239.1.1.180: 51003 B: 239.1.127.180: 51003	651	A: 239.1.1.239: 51003 B: 239.1.127.239: 51003	A: 239.1.1.201: 51003 B: 239.1.127.201: 51003
Derivatives Non-SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	161	A: 239.1.1.218: 51004 B: 239.1.127.218: 51004	A: 239.1.1.180: 51004 B: 239.1.127.180: 51004	661	A: 239.1.1.239: 51004 B: 239.1.127.239: 51004	A: 239.1.1.201: 51004 B: 239.1.127.201: 51004
Derivatives Non-SOM Quote Request Channel	Quote Request (336)	164	A: 239.1.1.218: 51005 B: 239.1.127.218: 51005	A: 239.1.1.180: 51005 B: 239.1.127.180: 51005			
Non-SOM Open Interest Channel	Open Interest (366)	191	A: 239.1.1.227: 51001 B: 239.1.127.227: 51001	A: 239.1.1.189: 51001 B: 239.1.127.189: 51001	691	A: 239.1.1.248: 51001 B: 239.1.127.248: 51001	A: 239.1.1.210: 51001 B: 239.1.127.210: 51001

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Derivatives Non-SOM Level 2 Price and COP (Partition 1) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353)	134	A: 239.1.1.220: 51001 B: 239.1.127.220: 51001	A: 239.1.1.182: 51001 B: 239.1.127.182: 51001	634	A: 239.1.1.241: 51001 B: 239.1.127.241: 51001	A: 239.1.1.203: 51001 B: 239.1.127.203: 51001
Derivatives Non-SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353)	234	A: 239.1.1.220: 51002 B: 239.1.127.220: 51002	A: 239.1.1.182: 51002 B: 239.1.127.182 :51002	734	A: 239.1.1.241: 51002 B: 239.1.127.241: 51002	A: 239.1.1.203: 51002 B: 239.1.127.203: 51002
Derivatives Non-SOM Trade Statistic Channel	Trade Statistic (360)	171	A: 239.1.1.220: 51003 B: 239.1.127.220: 51003	A: 239.1.1.182: 51003 B: 239.1.127.182: 51003	671	A: 239.1.1.241: 51003 B: 239.1.127.241: 51003	A: 239.1.1.203: 51003 B: 239.1.127.203: 51003
Derivatives Non-SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.232: 51000 B: 239.1.127.232: 51000	A: 239.1.1.194: 51000 B: 239.1.127.194: 51000	677	A: 239.1.1.253: 51000 B: 239.1.127.253: 51000	A: 239.1.1.215: 51000 B: 239.1.127.215: 51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.229: 51000 B: 239.1.127.229: 51000	A: 239.1.1.191: 51000 B: 239.1.127.191: 51000	699	A: 239.1.1.250: 51000 B: 239.1.127.250: 51000	A: 239.1.1.212: 51000 B: 239.1.127.212: 51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.232: 51006 B: 239.1.127.232: 51006	A: 239.1.1.194: 51006 B: 239.1.127.194: 51006			

2.2.2 OMD Derivatives Standard (SOM) (conflated)

		Real-time Market Data Services			Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**		**Channel ID**	**Multicast Channel Subscriptions**
			HKATS Testing Environment	**OMD-D RT Environment**		**HKATS Testing Environment**	**OMD-D RT Environment**
Derivatives SOM Series Definition Reference Data	Series Definition Base (303) Combination	102	A: 239.1.1.217: 51001 B: 239.1.127.217:	A: 239.1.1.179: 51001 B: 239.1.127.179:	602	A: 239.1.1.238: 51001 B: 239.1.127.238:	A: 239.1.1.200: 51001 B: 239.1.127.200:

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Channel (Partition 1)	Definition (305)		51001	51001		51001	51001
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	202	A: 239.1.1.217: 51002 B: 239.1.127.217: 51002	A: 239.1.1.179: 51002 B: 239.1.127.179: 51002	702	A: 239.1.1.238: 51002 B: 239.1.127.238: 51002	A: 239.1.1.200: 51002 B: 239.1.127.200: 51002
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	152	A: 239.1.1.217: 51003 B: 239.1.127.217:51003	A: 239.1.1.179: 51003 B: 239.1.127.179: 51003	652	A: 239.1.1.238: 51003 B: 239.1.127.238: 51003	A: 239.1.1.200: 51003 B: 239.1.127.200: 51003
Derivatives SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	162	A: 239.1.1.217: 51004 B: 239.1.127.217: 51004	A: 239.1.1.179: 51004 B: 239.1.127.179: 51004	662	A: 239.1.1.238: 51004 B: 239.1.127.238: 51004	A: 239.1.1.200: 51004 B: 239.1.127.200: 51004
Derivatives SOM Quote Request Channel	Quote Request (336)	165	A: 239.1.1.217: 51005 B: 239.1.127.217: 51005	A: 239.1.1.179: 51005 B: 239.1.127.179: 51005			
SOM Open Interest Channel	Open Interest (366)	192	A: 239.1.1.225: 51001 B: 239.1.127.225: 51001	A: 239.1.1.187: 51001 B: 239.1.127.187: 51001	692	A: 239.1.1.246: 51001 B: 239.1.127.246: 51001	A: 239.1.1.208: 51001 B: 239.1.127.208: 51001
Derivatives SOM Level 2 Price and COP (Partition 1) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353)	135	A: 239.1.1.219: 51001 B: 239.1.127.219: 51001	A: 239.1.1.181: 51001 B: 239.1.127.181: 51001	635	A: 239.1.1.240: 51001 B: 239.1.127.240: 51001	A: 239.1.1.202: 51001 B: 239.1.127.202: 51001
Derivatives SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353)	235	A: 239.1.1.219: 51002 B: 239.1.127.219: 51002	A: 239.1.1.181: 51002 B: 239.1.127.181: 51002	735	A: 239.1.1.240: 51002 B: 239.1.127.240: 51002	A: 239.1.1.202: 51002 B: 239.1.127.202: 51002
Derivatives SOM Trade	Trade Statistic (360)	172	A: 239.1.1.219:	A: 239.1.1.181:	672	A: 239.1.1.240:	A: 239.1.1.202:

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Statistic Channel			51003 B: 239.1.127.219: 51003	51003 B: 239.1.127.181: 51003		51003 B: 239.1.127.240: 51003	51003 B: 239.1.127.202: 51003
Derivatives SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.232: 51000 B: 239.1.127.232: 51000	A: 239.1.1.194: 51000 B: 239.1.127.194: 51000	677	A: 239.1.1.253: 51000 B: 239.1.127.253: 51000	A: 239.1.1.215: 51000 B: 239.1.127.215: 51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.229: 51000 B: 239.1.127.229: 51000	A: 239.1.1.191: 51000 B: 239.1.127.191: 51000	699	A: 239.1.1.250: 51000 B: 239.1.127.250: 51000	A: 239.1.1.212: 51000 B: 239.1.127.212: 51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.232: 51006 B: 239.1.127.232: 51006	A: 239.1.1.194: 51006 B: 239.1.127.194: 51006			

2.2.3 OMD Derivatives Premium (non-SOM) (streaming)

			Real-time Market Data Services			Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**		**Channel ID**	**Multicast Channel Subscriptions**	
			HKATS Testing Environment	**OMD-D RT Environment**		**HKATS Testing Environment**	**OMD-D RT Environment**
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	101	A: 239.1.1.218: 51001 B: 239.1.127.218: 51001	A: 239.1.1.180: 51001 B: 239.1.127.180: 51001	601	A: 239.1.1.239: 51001 B: 239.1.127.239: 51001	A: 239.1.1.201: 51001 B: 239.1.127.201: 51001
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	201	A: 239.1.1.218: 51002 B: 239.1.127.218: 51002	A: 239.1.1.180: 51002 B: 239.1.127.180: 51002	701	A: 239.1.1.239: 51002 B: 239.1.127.239: 51002	A: 239.1.1.201: 51002 B: 239.1.127.201: 51002
Derivatives Non-SOM Series Definition Reference Data	Commodity Definition (301) Class Definition	151	A: 239.1.1.218: 51003 B: 239.1.127.218: 51003	A: 239.1.1.180: 51003 B: 239.1.127.180: 51003	651	A: 239.1.1.239: 51003 B: 239.1.127.239: 51003	A: 239.1.1.201: 51003 B: 239.1.127.201:

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Channel	(302) Series Definition Extended (304)						51003
Derivatives Non-SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	161	A: 239.1.1.218: 51004 B: 239.1.127.218: 51004	A: 239.1.1.180: 51004 B: 239.1.127.180: 51004	661	A: 239.1.1.239: 51004 B: 239.1.127.239: 51004	A: 239.1.1.201: 51004 B: 239.1.127.201: 51004
Derivatives Non-SOM Quote Request Channel	Quote Request (336)	164	A: 239.1.1.218: 51005 B: 239.1.127.218: 51005	A: 239.1.1.180: 51005 B: 239.1.127.180: 51005			
Non-SOM Open Interest Channel	Open Interest (366)	191	A: 239.1.1.227: 51001 B: 239.1.127.227: 51001	A: 239.1.1.189: 51001 B: 239.1.127.189: 51001	691	A: 239.1.1.248: 51001 B: 239.1.127.248: 51001	A: 239.1.1.210: 51001 B: 239.1.127.210: 51001
Derivatives Non-SOM Level 2 Price and COP (Partition 1) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353) Trade (350)	131	A: 239.1.1.224: 51001 B: 239.1.127.224: 51001	A: 239.1.1.186: 51001 B: 239.1.127.186: 51001	631	A: 239.1.1.245: 51001 B: 239.1.127.245: 51001	A: 239.1.1.207: 51001 B: 239.1.127.207: 51001
Derivatives Non-SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353) Trade (350)	231	A: 239.1.1.224: 51002 B: 239.1.127.224: 51002	A: 239.1.1.186: 51002 B: 239.1.127.186: 51002	731	A: 239.1.1.245: 51002 B: 239.1.127.245: 51002	A: 239.1.1.207: 51002 B: 239.1.127.207: 51002
Derivatives Non-SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	167	A: 239.1.1.236: 51000 B: 239.1.127.236: 51000	A: 239.1.1.198: 51000 B: 239.1.127.198: 51000			
Derivatives Non-SOM Series Statistic Channel	Series Statistics (363)	174	A: 239.1.1.224: 51003 B: 239.1.127.224: 51003	A: 239.1.1.186: 51003 B: 239.1.127.186: 51003	674	A: 239.1.1.245: 51003 B: 239.1.127.245: 51003	A: 239.1.1.207: 51003 B: 239.1.127.207: 51003
Derivatives Non-SOM Market Alert	Market Alert (323)	177	A: 239.1.1.232: 51000	A: 239.1.1.194: 51000	677	A: 239.1.1.253: 51000	A: 239.1.1.215: 51000

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Channel			B: 239.1.127.232: 51000	B: 239.1.127.194: 51000		B: 239.1.127.253: 51000	B: 239.1.127.215: 51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.229: 51000 B: 239.1.127.229: 51000	A: 239.1.1.191: 51000 B: 239.1.127.191: 51000	699	A: 239.1.1.250: 51000 B: 239.1.127.250: 51000	A: 239.1.1.212: 51000 B: 239.1.127.212: 51000
Implied Volatility Channel	Implied Volatility (367)	194	A: 239.1.1.231: 51000 B: 239.1.127.231: 51000	A: 239.1.1.193: 51000 B: 239.1.127.193: 51000	694	A: 239.1.1.252: 51000 B: 239.1.127.252: 51000	A: 239.1.1.214: 51000 B:239.1.127.214: 51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.232: 51006 B: 239.1.127.232: 51006	A: 239.1.1.194: 51006 B: 239.1.127.194: 51006			

2.2.4 OMD Derivatives Premium (SOM) (streaming)

		Real-time Market Data Services			Refresh Snapshot Data Services		
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**		**Channel ID**	**Multicast Channel Subscriptions**	
			HKATS Testing Environment	**OMD-D RT Environment**		**HKATS Testing Environment**	**OMD-D RT Environment**
Derivatives SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	102	A: 239.1.1.217: 51001 B: 239.1.127.217: 51001	A: 239.1.1.179: 51001 B: 239.1.127.179: 51001	602	A: 239.1.1.238: 51001 B: 239.1.127.238: 51001	A: 239.1.1.200: 51001 B: 239.1.127.200: 51001
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	202	A: 239.1.1.217: 51002 B: 239.1.127.217: 51002	A: 239.1.1.179: 51002 B: 239.1.127.179: 51002	702	A: 239.1.1.238: 51002 B: 239.1.127.238: 51002	A: 239.1.1.200: 51002 B: 239.1.127.200: 51002
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	152	A: 239.1.1.217: 51003 B: 239.1.127.217: 51003	A: 239.1.1.179: 51003 B: 239.1.127.179: 51003	652	A: 239.1.1.238: 51003 B: 239.1.127.238: 51003	A: 239.1.1.200: 51003 B: 239.1.127.200: 51003

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Derivatives SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	162	A: 239.1.1.217: 51004 B: 239.1.127.217: 51004	A: 239.1.1.179: 51004 B: 239.1.127.179: 51004	662	A: 239.1.1.238: 51004 B: 239.1.127.238: 51004	A: 239.1.1.200: 51004 B: 239.1.127.200: 51004
Derivatives SOM Quote Request Channel	Quote Request (336)	165	A: 239.1.1.217: 51005 B: 239.1.127.217: 51005	A: 239.1.1.179: 51005 B: 239.1.127.179: 51005			
SOM Open Interest Channel	Open Interest (366)	192	A: 239.1.1.225: 51001 B: 239.1.127.225: 51001	A: 239.1.1.187: 51001 B: 239.1.127.187: 51001	692	A: 239.1.1.246: 51001 B: 239.1.127.246: 51001	A: 239.1.1.208: 51001 B:239.1.127.208: 51001
Derivatives SOM Level 2 Price and COP (Partition 1) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353) Trade (350)	132	A: 239.1.1.223: 51001 B: 239.1.127.223: 51001	A: 239.1.1.185: 51001 B: 239.1.127.185: 51001	632	A: 239.1.1.244: 51001 B: 239.1.127.244: 51001	A: 239.1.1.206: 51001 B: 239.1.127.206: 51001
Derivatives SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364) Aggregate Order Book Update (353) Trade (350)	232	A: 239.1.1.223: 51002 B: 239.1.127.223: 51002	A: 239.1.1.185: 51002 B: 239.1.127.185: 51002	732	A: 239.1.1.244: 51002 B: 239.1.127.244: 51002	A: 239.1.1.206: 51002 B: 239.1.127.206: 51002
Derivatives SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	168	A: 239.1.1.235: 51000 B: 239.1.127.235: 51000	A: 239.1.1.197: 51000 B: 239.1.127.197: 51000			
Derivatives SOM Series Statistic Channel	Series Statistics (363)	175	A: 239.1.1.223: 51003 B: 239.1.127.223: 51003	A: 239.1.1.185: 51003 B: 239.1.127.185: 51003	675	A: 239.1.1.244: 51003 B: 239.1.127.244: 51003	A: 239.1.1.206: 51003 B: 239.1.127.206: 51003
Derivatives SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.232: 51000 B: 239.1.127.232: 51000	A: 239.1.1.194: 51000 B: 239.1.127.194: 51000	677	A: 239.1.1.253: 51000 B: 239.1.127.253: 51000	A: 239.1.1.215: 51000 B: 239.1.127.215: 51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.229:	A: 239.1.1.191:	699	A: 239.1.1.250:	A: 239.1.1.212:

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			51000 B: 239.1.127.229: 51000	51000 B: 239.1.127.191: 51000		51000 B: 239.1.127.250: 51000	51000 B: 239.1.127.212: 51000
Implied Volatility Channel	Implied Volatility (367)	195	A: 239.1.1.230: 51000 B: 239.1.127.230: 51000	A: 239.1.1.192: 51000 B: 239.1.127.192: 51000	695	A: 239.1.1.251: 51000 B: 239.1.127.251: 51000	A: 239.1.1.213: 51000 B: 239.1.127.213: 51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.232: 51006 B: 239.1.127.232: 51006	A: 239.1.1.194: 51006 B: 239.1.127.194: 51006			

2.2.5 OMD Derivatives Full Tick (non-SOM) (streaming)

		Real-time Market Data Services			Refresh Snapshot Data Services		
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**		**Channel ID**	**Multicast Channel Subscriptions**	
			HKATS Testing Environment	**OMD-D RT Environment**		**HKATS Testing Environment**	**OMD-D RT Environment**
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	101	A: 239.1.1.218: 51001 B: 239.1.127.218: 51001	A: 239.1.1.180: 51001 B: 239.1.127.180: 51001	601	A: 239.1.1.239: 51001 B: 239.1.127.239: 51001	A: 239.1.1.201: 51001 B: 239.1.127.201: 51001
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	201	A: 239.1.1.218: 51002 B: 239.1.127.218: 51002	A: 239.1.1.180: 51002 B: 239.1.127.180: 51002	701	A: 239.1.1.239: 51002 B: 239.1.127.239: 51002	A: 239.1.1.201: 51002 B: 239.1.127.201: 51002
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	151	A: 239.1.1.218: 51003 B: 239.1.127.218: 51003	A: 239.1.1.180: 51003 B: 239.1.127.180: 51003	651	A: 239.1.1.239: 51003 B: 239.1.127.239: 51003	A: 239.1.1.201: 51003 B: 239.1.127.201: 51003

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Derivatives Non-SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	161	A: 239.1.1.218: 51004 B: 239.1.127.218: 51004	A: 239.1.1.180: 51004 B: 239.1.127.180: 51004	661	A: 239.1.1.239: 51004 B: 239.1.127.239: 51004	A: 239.1.1.201: 51004 B: 239.1.127.201: 51004
Derivatives Non-SOM Quote Request Channel	Quote Request (336)	164	A: 239.1.1.218: 51005 B: 239.1.127.218: 51005	A: 239.1.1.180: 51005 B: 239.1.127.180: 51005			
Derivatives Non-SOM Order, COP and Trade (Partition 1)	Calculated Opening Price (364) Add Order (330) Modify Order (331) Delete Order (332) Orderbook Clear (335) Trade (350)	121	A: 239.1.1.222: 51001 B: 239.1.127.222: 51001	A: 239.1.1.184: 51001 B: 239.1.127.184: 51001	621	A: 239.1.1.243: 51001 B: 239.1.127.243: 51001	A: 239.1.1.205: 51001 B: 239.1.127.205: 51001
Derivatives Non-SOM Order, COP and Trade (Partition 2)	Calculated Opening Price (364) Add Order (330) Modify Order (331) Delete Order (332) Orderbook Clear (335) Trade (350)	221	A: 239.1.1.222: 51002 B: 239.1.127.222: 51002	A: 239.1.1.184: 51002 B: 239.1.127.184: 51002	721	A: 239.1.1.243: 51002 B: 239.1.127.243: 51002	A: 239.1.1.205: 51002 B: 239.1.127.205: 51002
Derivatives Non-SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	167	A: 239.1.1.236: 51000 B: 239.1.127.236: 51000	A: 239.1.1.198: 51000 B: 239.1.127.198: 51000			
Derivatives Non-SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.232: 51000 B: 239.1.127.232: 51000	A: 239.1.1.194: 51000 B: 239.1.127.194: 51000	677	A: 239.1.1.253: 51000 B: 239.1.127.253: 51000	A: 239.1.1.215: 51000 B: 239.1.127.215: 51000
Derivatives DR Signal	Disaster Recovery	178	A: 239.1.1.232:	A: 239.1.1.194:			

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Channel	Signal (105)	51006 B: 239.1.127.232: 51006	51006 B: 239.1.127.194: 51006			

2.2.6 OMD Derivatives Full Tick (SOM) (streaming)

		Real-time Market Data Services		Refresh Snapshot Data Services		
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**	**Channel ID**	**Multicast Channel Subscriptions**	
			HKATS Testing Environment	**OMD-D RT Environment**		**HKATS Testing Environment**	**OMD-D RT Environment**
Derivatives SOM Series Definition Reference Data Channel (Partition 1)	Series Definition Base (303) Combination Definition (305)	102	A: 239.1.1.217: 51001 B: 239.1.127.217: 51001	A: 239.1.1.179: 51001 B: 239.1.127.179: 51001	602	A: 239.1.1.238: 51001 B: 239.1.127.238: 51001	A: 239.1.1.200: 51001 B: 239.1.127.200: 51001
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303) Combination Definition (305)	202	A: 239.1.1.217: 51002 B: 239.1.127.217: 51002	A: 239.1.1.179: 51002 B: 239.1.127.179: 51002	702	A: 239.1.1.238: 51002 B: 239.1.127.238: 51002	A: 239.1.1.200: 51002 B: 239.1.127.200: 51002
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301) Class Definition (302) Series Definition Extended (304)	152	A: 239.1.1.217: 51003 B: 239.1.127.217: 51003	A: 239.1.1.179: 51003 B: 239.1.127.179: 51003	652	A: 239.1.1.238: 51003 B: 239.1.127.238: 51003	A: 239.1.1.200: 51003 B: 239.1.127.200: 51003
Derivatives SOM Series & Market Status Channel	Market Status (320) Series Status (321) Commodity Status (322)	162	A: 239.1.1.217: 51004 B: 239.1.127.217: 51004	A: 239.1.1.179: 51004 B: 239.1.127.179: 51004	662	A: 239.1.1.238: 51004 B: 239.1.127.238: 51004	A: 239.1.1.200: 51004 B: 239.1.127.200: 51004
Derivatives SOM Quote Request Channel	Quote Request (336)	165	A: 239.1.1.217: 51005 B: 239.1.127.217: 51005	A: 239.1.1.179: 51005 B: 239.1.127.179: 51005			
Derivatives SOM Order, COP and Trade	Calculated Opening Price (364) Add Order	122	A: 239.1.1.221: 51001 B: 239.1.127.221:	A: 239.1.1.183: 51001 B: 239.1.127.183:	622	A: 239.1.1.242: 51001 B: 239.1.127.242:	A: 239.1.1.204: 51001 B:

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(Partition 1)	(330) Modify Order (331) Delete Order (332) Orderbook Clear (335) Trade (350)		51001	51001		51001	239.1.127.204: 51001
Derivatives SOM Order, COP and Trade (Partition 2)	Calculated Opening Price (364) Add Order (330) Modify Order (331) Delete Order (332) Orderbook Clear (335) Trade (350)	222	A: 239.1.1.221: 51002 B: 239.1.127.221: 51002	A: 239.1.1.183: 51002 B: 239.1.127.183: 51002	722	A: 239.1.1.242: 51002 B: 239.1.127.242: 51002	A: 239.1.1.204: 51002 B: 239.1.127.204: 51002
Derivatives SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	168	A: 239.1.1.235: 51000 B: 239.1.127.235: 51000	A: 239.1.1.197: 51000 B: 239.1.127.197: 51000			
Derivatives SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.232: 51000 B: 239.1.127.232: 51000	A: 239.1.1.194: 51000 B: 239.1.127.194: 51000	677	A: 239.1.1.253: 51000 B: 239.1.127.253: 51000	A: 239.1.1.215: 51000 B: 239.1.127.215: 51000
Derivatives DR Signal Channel	Disaster Recovery Signal (105)	178	A: 239.1.1.232: 51006 B: 239.1.127.232: 51006	A: 239.1.1.194: 51006 B: 239.1.127.194: 51006			

2.2.7 OMD Derivatives Trade (non-SOM) (streaming)

			Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**		**Channel ID**	**Multicast Channel Subscriptions**
			HKATS Testing Environment	**OMD-D RT Environment**		
Derivatives Non-SOM	Trade (350)	111	A: 239.1.1.234:51001	A: 239.1.1.196:51001	N/A	

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Trade Channel (Partition 1)			B: 239.1.127.234:51001	B: 239.1.127.196:51001	
Derivatives Non-SOM Trade Channel (Partition 2)	Trade (350)	211	A: 239.1.1.234:51002 B: 239.1.127.234:51002	A: 239.1.1.196:51002 B: 239.1.127.196:51002	N/A
Derivatives Non-SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	167	A: 239.1.1.236: 51000 B: 239.1.127.236: 51000	A: 239.1.1.198: 51000 B: 239.1.127.198: 51000	N/A

2.2.8 OMD Derivatives Trade (SOM) (streaming)

			Real-time Market Data Services		Refresh Snapshot Data Services	
Multicast Service	**Contents**	**Channel ID**	**Multicast Channel Subscriptions**		**Channel ID**	**Multicast Channel Subscriptions**
			HKATS Testing Environment	**OMD-D RT Environment**		
Derivatives SOM Trade Channel (Partition 1)	Trade (350)	112	A: 239.1.1.233:51001 B: 239.1.127.233:51001	A: 239.1.1.195:51001 B: 239.1.127.195:51001		N/A
Derivatives SOM Trade Channel (Partition 2)	Trade (350)	212	A: 239.1.1.233:51002 B: 239.1.127.233:51002	A: 239.1.1.195:51002 B: 239.1.127.195:51002		N/A
Derivatives SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	168	A: 239.1.1.235:51000 B: 239.1.127.235:51000	A: 239.1.1.197:51000 B: 239.1.127.197:51000		N/A

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2.2.9 HKEX OMD Retransmission Unicast Connectivity

HKEX provides a Retransmission Service to its OMD clients to recover multicast packet loss. Functional details of the Retransmission Service are provided in the Interface Specification. Find below the Unicast Addresses to connect to the OMD Retransmission Servers in the test environments.

Retransmission Server	IP Unicast Address
OMD-D at OMD-D RT Environment - *for OMD-D Readiness Test, Practice Session, Open Test*	
Primary server in primary site	10.170.3.141:55455
Secondary server in primary site	10.170.3.142:55455
Primary server in DR site	10.170.13.141:55455
Secondary server in DR site	10.170.13.142:55455
OMD-D at HKATS Testing Environment - *for EPs to perform End-to-end Loop Test with HKATS*	
Primary server in primary site	10.170.3.145:55455

2.3 Individual Client Configuration Details

Individual clients will be provided with the following configuration details for each set of product feed subscription:

- One Retransmission User ID (Username)
- The subnet and subnet mask of the client segment
- Two unicast client allowable IP addresses for connection with re-transmission servers
- Two physical IP addresses and two Virtual IP address of SDNet/2 routers
- HSRP/VRRP groups used by SDNet/2 routers

Individual client testing configuration information will be provided separately prior to the Open Test/Readiness Test whilst the client specific production configuration information will be provided upon the client's successful completion of the Readiness Test and prior to the Market Rehearsals/Post Release Test. Please refer to Appendix B for an example of Client Configuration information.

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3. Guidelines on SDNet/2 lines / HSN connection

3.1 Mode of OMD connection

- For resilience purpose, at least 2 SDNet/2 or HSN lines are required for OMD connection either for individual OMD datafeed product or sharing among different OMD datafeed products.
- The set of 2 SDNet/2 lines is required to locate in the same location. If clients require receiving OMD data in multiple locations, 1 set of 2 SDNet/2 lines is required to install in each location.

3.2 Bandwidth Requirement

Full suite of OMD datafeed products for Derivatives Market data and respective estimated bandwidth requirements are as follows.

3.2.1 Production SDNet/2 / HSN and Testing SDNet/2 / HSN for OMD-D Readiness Test

Datafeed plus add-ons	Non-SOM	/ SOM /	Non-SOM + SOM	Derivatives Trade ("DT")	OMD-Index[1]	SDNet/2 High Performance Option**
Derivatives Standard (DS)	14 Mbps	14 Mbps	28 Mbps	2Mbps	Negligible	Please see note
Derivatives Premium (DP)	26 Mbps	34 Mbps	60 Mbps	N/A	Negligible	Please see note
Derivatives FullTick (DF)	25 Mbps	35 Mbps	60 Mbps	N/A	Negligible	Please see note

* Update rates of individual indices depend on respective index providers.

** DP and DF Clients have to subscribe to lines with High Performance Option (HPO) to avoid potential data loss in the event of bursty traffic that could happen in the production environment.

3.2.2 Testing SDNet/2 / HSN for OMD-D and HKATS Testing Environment

Datafeed plus add-ons	Non-SOM	/ SOM /	Non-SOM + SOM	Derivatives Trade ("DT")	OMD-Index[2]	SDNet/2 High Performance Option
Derivatives Standard (DS)	1 Mbps	5 Mbps	6 Mbps	Negligible	N/A	Not Required
Derivatives Premium (DP)	2 Mbps	7 Mbps	9 Mbps	N/A	N/A	Not Required
Derivatives FullTick (DF)	1 Mbps	4 Mbps	5 Mbps	N/A	N/A	Not Required

[1] For OMD-Index connectivity information, please refer to the Connectivity Guide for OMD Securities Market and Index Datafeed Products (OMD-C).

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3.3 Sharing of SDNet/2 lines or HSN port set

Clients may opt to use separated sets or same set of SDNet/2 lines/ HSN ports for receiving data of different OMD datafeed products and other HKEX datafeeds, e.g. CG subject to certain limitations.

Under the current multicast transmission protocol of OMD, clients are required to establish live-live connections regardless of whether they are connecting through SDNet/2 or HSN Port in HKEX's Hosting site.

Sharing of SDNet/2 lines for different OMD datafeed products and other applications, e.g. CG is allowed and clients are required to make sure the bandwidth of the SDNet/2 lines is sufficient to support the multiple applications sharing the lines and they are aware of the potential issues for sharing of lines.

Under the Hosting setup, 1 HSN Port Set contains 2 ports which can serve the live-live connections for OMD (multicast application) and live-backup connection for other unicast application, e.g. CG.

Clients who would like to establish new HSN connection for other unicast applications which are in live-live mode may need to apply for an additional set of HSN circuits, or consider another solution that meets the same resilience requirement.

In addition, clients should note the following policies on sharing of SDNet/2 or HSN lines for OMD datafeed products:

- Sharing of same set of production SDNet/2 / HSN circuits for **more than 1 OMD datafeed products of different markets** (i.e. securities market datafeed and derivatives market datafeed) **is allowed.**

- Sharing of the same SDNet/2 / HSN circuits for both product and testing purposes is **NOT ALLOWED**.

- **Exchange Participants** who would like to **share the same SDNet/2 circuits with trading traffic (orders and trades) and market data traffic** are however **only** allowed to do so if all the traffic **on** the circuits belongs to **the same market** (i.e. either securities market or derivatives market). OMD-Index, which is market neutral, can be carried on the same circuits with securities market or derivatives market. For example, Exchange Participants of derivatives market may use the same SDNet/2 circuits for their access to OMD-D DS, OMD-Index and HKATS CG.

- Clients should note and consider the followings if they are going to adopt shared line mode:
  i) In case of failure/interruption of the shared circuits, all datafeed products using this set of circuits will be affected.
  ii) Troubleshooting for network related issues (e.g. performance, latency or packet loss etc.) will be much more difficult and time consuming and assistance from network carriers and HKEX will be limited in such troubleshooting. Clients must accept this risk in making the line sharing decision.
  iii) Due to the difference in operating hours and testing windows between securities and derivatives markets, clients should make sure any maintenance/testing of one of the systems does not affect the rest of the systems sharing the same set of circuits.

3.4 Bandwidth for shared SDNet/2 lines or HSN port set

i) Shared SDNet/2 / HSN circuits must have sufficient bandwidth to support the data transmission of multiple products/devices. Please see below examples for reference:

Example 1: Sharing of a set of SDNet/2 lines for OMD DP and OMD DF:-

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The estimated bandwidth requirements for DP and DF (SOM & non-SOM) are 60Mbps and 60Mbps, a set of SDNet/2 lines with 120Mbps will be required.

Example 2: Sharing of a set of SDNet/2 lines for OMD DF, CG:-
The estimated bandwidth requirements for the OMD DF (SOM & non-SOM), CG are 60Mbps and 10Mbps respectively. The bandwidth for the common set of SDNet/2 lines will therefore be 70Mbps (minimum incremental bandwidth threshold is 10Mbps for SDNet/2 lines of 10Mbps-100Mbps)

ii) Clients can allocate bandwidth of the shared lines to different products as they wish as long as the bandwidth allocated to each datafeed product meets the estimated bandwidth requirement specified by HKEX.

3.5 SDNet/2 High Performance Option

Clients who are required to install circuits with a bandwidth of 30 Mbps or above for connecting to HKEX systems have to subscribe to lines with High Performance Option (HPO) to avoid potential data loss in the event of bursty traffic that could happen in the production environment.

High Performance Option of SDNet/2 which transmits data in relatively high packet rates is required for clients who subscribe to OMD streaming feeds, i.e. DP and DF. OMD DS provides conflated price level information, and the message rate sent for the conflation period is relatively not high, so HPO is not necessary.

Please refer to Appendix A for details on high performance options provided by different SDNet/2 providers.

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4. Other Guidelines on OMD Connections

4.1 Additional Login IDs/Client IP addresses for Unicast Retransmission Service

Direct connection clients will get one set of login ID with two IP addresses for retransmission service per OMD-D datafeed subscription. That means, clients subscribing to one set of DP feed and one set of DF feed will get two login IDs each with two IP addresses. These login IDs would be generic ID where each ID can be used to recover either the DP and DF missing data rather than tied to the respective datafeed product associated with that login ID provided that the same pair of SDNet/2 or HSN circuits is used for receiving the data from both DP and DF.

Exchange Participants who are entitled to receive two sets of complimentary DS feed via two different pairs of circuits when migrating to HKATS CG would also be entitled to one complimentary login ID per set of DS feed which is also a generic ID.

To facilitate different clients' internal setup or operational requirement, an additional set of login ID and with/without IP addresses for retransmission service can be offered to clients at a cost on a per request basis.

4.2 Installation of SDNet/2 and HSN lines

4.2.1 SDNet/2 lines

Clients are required to contact the SDNet/2 Accredited Vendors for installation of SDNet/2 lines for OMD connection. Details of the SDNet/2 Accredited Vendors and reference costs charged by different SDNet/2 Accredited Vendors can be found in Appendix A.

4.2.2 HSN lines

Clients who will use HKEX's Hosting Service for OMD connection should contact our Hosting Service team directly for details on the HSN lines.

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Appendix A – SDNet/2 Accredited Vendors Information

SDNet/2 services are provided by Accredited Vendors for the provision of circuits from EP/CP/IV locations to HKEX's data centres.

To become an Accredited Vendor, the Vendor's SDNet/2 service must comply with the technical requirements set out by HKEX. The compliance of these technical requirements ensures the Accredited Vendor will deliver a stable, reliable and high quality networking services to the EPs/CPs/IVs.

Three Accredited Vendors have been selected and accredited to provide SDNet/2 network services. These vendors are (in alphabetical order):

- Hong Kong Telecommunications (HKT) Limited (also known as PCCW)
- Hutchison Global Communications Limited (HGC)
- Wharf T&T Limited (Wharf T&T)

For details of SDNet/2 circuit price information / technical specification / service level, please refer to Price Information / Technical Specification / Service Level of SDNet/2 posted on HKEX website.

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Appendix B Sample Client Configuration Information

Client End Network Information (Sample):

1	Username	*CLIENT1*
2	OMD LAN Subnet	*10.55.64.0*
3	OMD LAN Subnet Mask	*255.255.255.224*
4	Vendor Allowable IP Address 1 for retransmission	*10.55.64.2*
5	Vendor Allowable IP Address 2 for retransmission	*10.55.64.29*
6	SDNet/2 Primary Circuit Number	*808311*
7	SDNet/2 Router A LAN IP Address (IP-A)	*10.55.64.14*
8	SDNet/2 Secondary Circuit Number	*808312*
9	SDNet/2 Router B LAN IP Address (IP-B)	*10.55.64.17*
10	SDNet/2 OMD LAN 1st Virtual Gateway IP Address (Virt-A)	*10.55.64.1*
11	HSRP/~~VRRP~~ Group Number used by SDNet/2 Router for Virt-A	*14*
12	SDNet/2 OMD LAN 2nd Virtual Gateway IP Address (Virt-B)	*10.55.64.30*
13	HSRP/~~VRRP~~ Group Number used by SDNet/2 Router for Virt-B	*17*
14	Multicast Protocol used by SDNet/2 Routers	*IGMPv2*
15	SDNet/2 Router Physical Interface for OMD	*gi1/0/1*
16	SDNet/2 Router Port Speed for OMD	*Auto Sense up to 1Gbps*
17	SDNet/2 Router Port Duplex Mode for OMD	*Auto Negotiation*
18	IP address ranges usable by Vendors (IP addresses outside these ranges are used and reserved by HKEX) Note: Vendors can use same set of addresses for Unicast retransmission for the multicast transmission)	*10.55.64.9-13* *10.55.64.18-22*

Host End Network Information (Sample):

1	Multicast Source Segment of Stream A in Primary Site forwarded by Vendor SDNet/2 Router A	*10.0.8.0/24*
2	Multicast Source Segment of Stream A in Backup Site forwarded by Vendor SDNet/2 Router A	*10.0.10.0/24*
3	Multicast Source Segment for multicast stream B in Primary Site forwarded by Vendor SDNet/2 Router B	*10.0.9.0/24*
4	Multicast Source Segment for multicast stream B in Backup Site forwarded by Vendor SDNet/2 Router B	*10.0.11.0/24*
5	Primary Site Primary Retransmission Server IP Address	*10.170.3.121/24*
6	Primary Site Primary Retransmission Server TCP Port Number	*55455*
7	Primary Site Secondary Retransmission Server IP Address	*10.170.3.122/24*
8	Primary Site Secondary Retransmission Server TCP Port Number	*55455*
9	Backup Site Primary Retransmission Server IP Address	*10.170.13.121/24*
10	Backup Site Primary Retransmission Server TCP Port Number	*55455*
11	Backup Site Secondary Retransmission Server IP Address	*10.170.13.122/24*
12	Backup Site Secondary Retransmission Server TCP Port Number	*55455*

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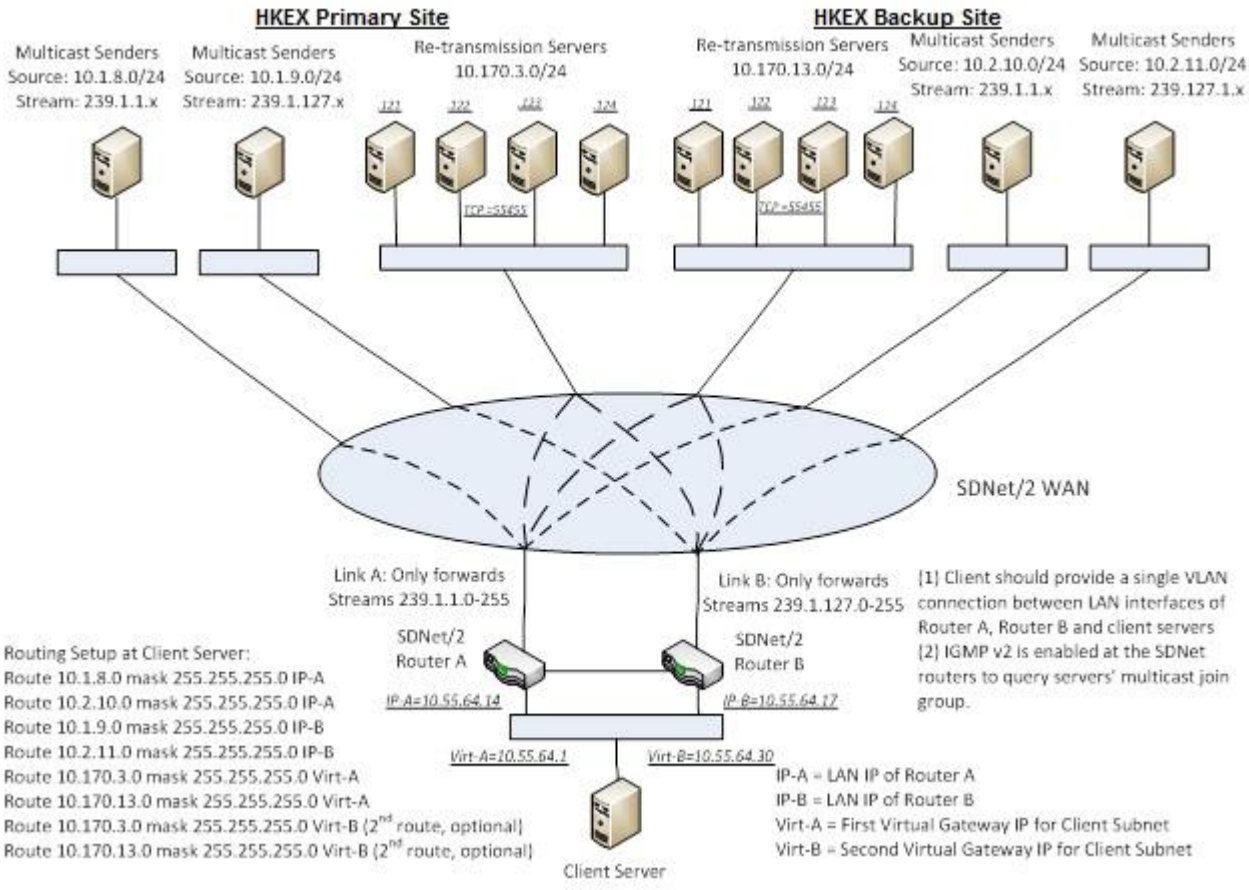

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