



CONNECTIVITY GUIDE

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

Version 1.5

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1. Overview

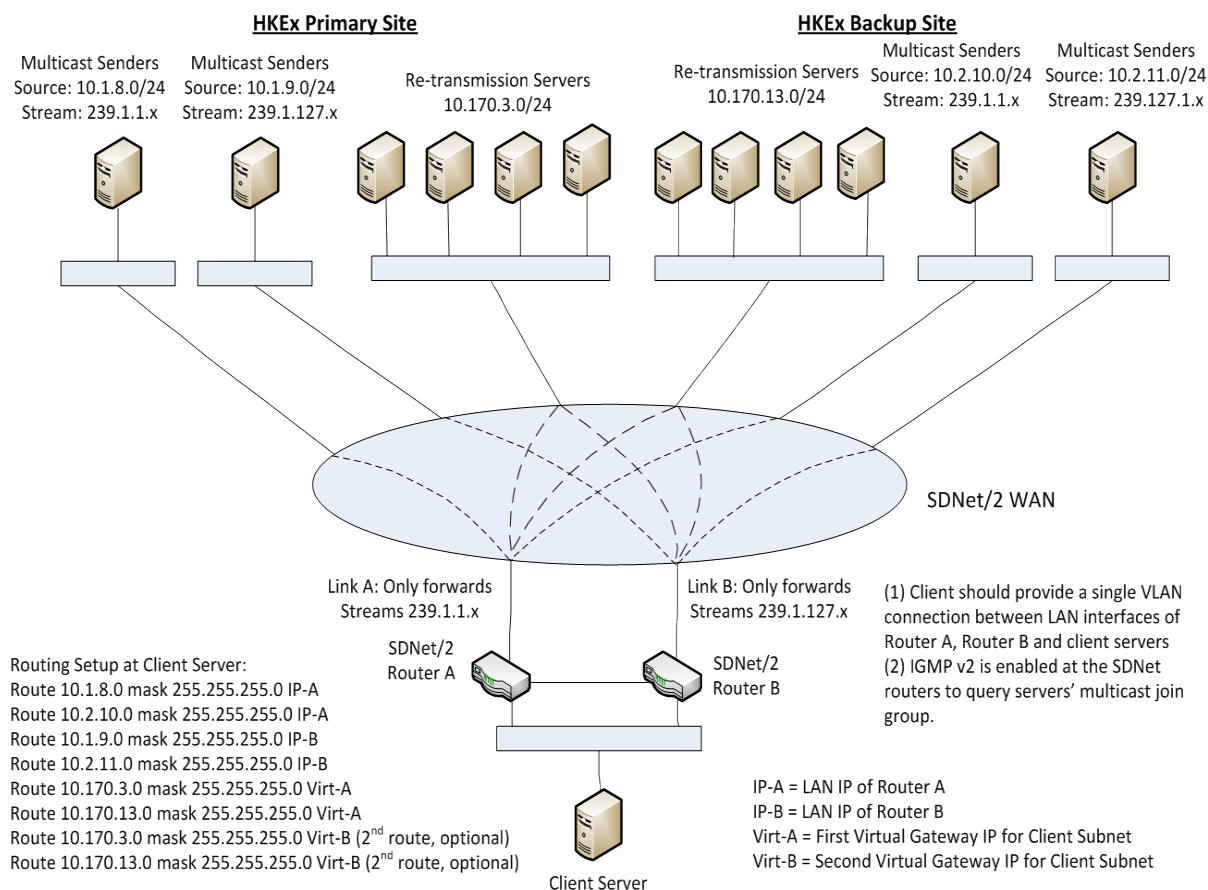
This document aims to provide network configuration information and guidance to assist information vendors and end-users (“clients”) in setting up their networks for making connection to OMD-D testing and production environments.

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

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.

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.

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)	101	A: 239.1.1.128:51001	601	A: 239.1.1.153:51001
	Combination Definition (305)		B: 239.1.127.128:51001		B: 239.1.127.153:51001
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303)	201	A: 239.1.1.128:51002	701	A: 239.1.1.153:51002
	Combination Definition (305)		B: 239.1.127.128:51002		B: 239.1.127.153:51002
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301)	151	A: 239.1.1.128:51003	651	A: 239.1.1.153:51003
	Class Definition (302)		B: 239.1.127.128:51003		B: 239.1.127.153:51003
	Series Definition Extended (304)				
Derivatives Non-SOM Series & Market Status Channel	Market Status (320)	161	A: 239.1.1.128:51004	661	A: 239.1.1.153:51004
	Series Status (321)		B: 239.1.127.128:51004		B: 239.1.127.153:51004
	Commodity Status (322)				
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

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

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)	102	A: 239.1.1.133:51001	602	A: 239.1.1.158:51001
	Combination Definition (305)		B: 239.1.127.133:51001		B: 239.1.127.158:51001
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303)	202	A: 239.1.1.133:51002	702	A: 239.1.1.158:51002
	Combination Definition (305)		B: 239.1.127.133:51002		B: 239.1.127.158:51002
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301)	152	A: 239.1.1.133:51003	652	A: 239.1.1.158:51003
	Class Definition (302)		B: 239.1.127.133:51003		B: 239.1.127.158:51003
	Series Definition Extended (304)				
Derivatives SOM Series & Market Status Channel	Market Status (320)	162	A: 239.1.1.133:51004	662	A: 239.1.1.158:51004
	Series Status (321)		B: 239.1.127.133:51004		B: 239.1.127.158:51004
	Commodity Status (322)				
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)	135	A: 239.1.1.137:51001	635	A: 239.1.1.162:51001
	Aggregate Order Book Update (353)		B: 239.1.127.137:51001		B: 239.1.127.162:51001
Derivatives SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364)	235	A: 239.1.1.137:51002	735	A: 239.1.1.162:51002
	Aggregate Order Book Update (353)		B: 239.1.127.137:51002		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

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)	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
	Combination Definition (305)				
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303)	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
	Combination Definition (305)				
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301)	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
	Class Definition (302)				
	Series Definition Extended (304)				
Derivatives Non-SOM Series & Market Status Channel	Market Status (320)	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
	Series Status (321)				
	Commodity Status (322)				
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)	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
	Aggregate Order Book Update (353)				
	Trade (350)				
Derivatives Non-SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364)	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
	Aggregate Order 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

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)	102	A: 239.1.1.133:51001	602	A: 239.1.1.158:51001
	Combination Definition (305)		B: 239.1.127.133:51001		B: 239.1.127.158:51001
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303)	202	A: 239.1.1.133:51002	702	A: 239.1.1.158:51002
	Combination Definition (305)		B: 239.1.127.133:51002		B: 239.1.127.158:51002
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301)	152	A: 239.1.1.133:51003	652	A: 239.1.1.158:51003
	Class Definition (302)		B: 239.1.127.133:51003		B: 239.1.127.158:51003
	Series Definition Extended (304)				
Derivatives SOM Series & Market Status Channel	Market Status (320)	162	A: 239.1.1.133:51004	662	A: 239.1.1.158:51004
	Series Status (321)		B: 239.1.127.133:51004		B: 239.1.127.158:51004
	Commodity Status (322)				
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)	132	A: 239.1.1.136:51001	632	A: 239.1.1.161:51001
	Aggregate Order Book Update (353)		B: 239.1.127.136:51001		B: 239.1.127.161:51001
	Trade (350)				
Derivatives SOM Level 2 Price and COP (Partition 2) Channel	Calculated Opening Price (364)	232	A: 239.1.1.136:51002	732	A: 239.1.1.161:51002
	Aggregate Order Book Update (353)		B: 239.1.127.136:51002		B: 239.1.127.161:51002
	Trade (350)				
Derivatives SOM Trade Adjustment Channel	Trade (350)	168	A: 239.1.1.140:51000		
	Trade Amendment (356)		B: 239.1.127.140:51000		

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

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)	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
	Combination Definition (305)				
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303)	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
	Combination Definition (305)				
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301)	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
	Class Definition (302)				
	Series Definition Extended (304)				
Derivatives Non-SOM Series & Market Status Channel	Market Status (320)	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
	Series Status (321)				
	Commodity Status (322)				
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)	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
	Add Order (330)				
	Modify Order (331)				
	Delete Order (332)				
	Orderbook Clear (335)				
	Trade (350)				
Derivatives Non-SOM Order, COP and Trade (Partition 2)	Calculated Opening Price (364)	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
	Add Order (330)				
	Modify Order (331)				
	Delete Order (332)				
	Orderbook Clear				

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

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)	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
	Combination Definition (305)				
Derivatives SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303)	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
	Combination Definition (305)				
Derivatives SOM Series Definition Reference Data Channel	Commodity Definition (301)	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
	Class Definition (302)				
	Series Definition Extended (304)				
Derivatives SOM Series & Market Status Channel	Market Status (320)	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
	Series Status (321)				
	Commodity Status (322)				
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)	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
	Add Order (330)				
	Modify Order (331)				
	Delete Order (332)				
	Orderbook Clear (335)				
	Trade (350)				
Derivatives SOM Order, COP and Trade (Partition 2)	Calculated Opening Price (364)	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
	Add Order (330)				
	Modify Order (331)				
	Delete Order (332)				
	Orderbook Clear (335)				
	Trade (350)				

Derivatives SOM	Trade (350)	168	A: 239.1.1.140:51000		
Trade			B:		
Adjustment	Trade Amendment		239.1.127.140:51000		
Channel	(356)				
Derivatives SOM	Market Alert (323)	177	A: 239.1.1.144:51000	677	A: 239.1.1.169:51000
Market Alert			B:		B: 239.1.127.169:51000
Channel			239.1.127.144:51000		

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

Multicast Service	Contents	Real-time Market Data Services		Refresh Snapshot Data Services	
		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		

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		

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

2.2 OMD-D Test Environment Connectivity Details

There are two OMD-D Test Environments available:

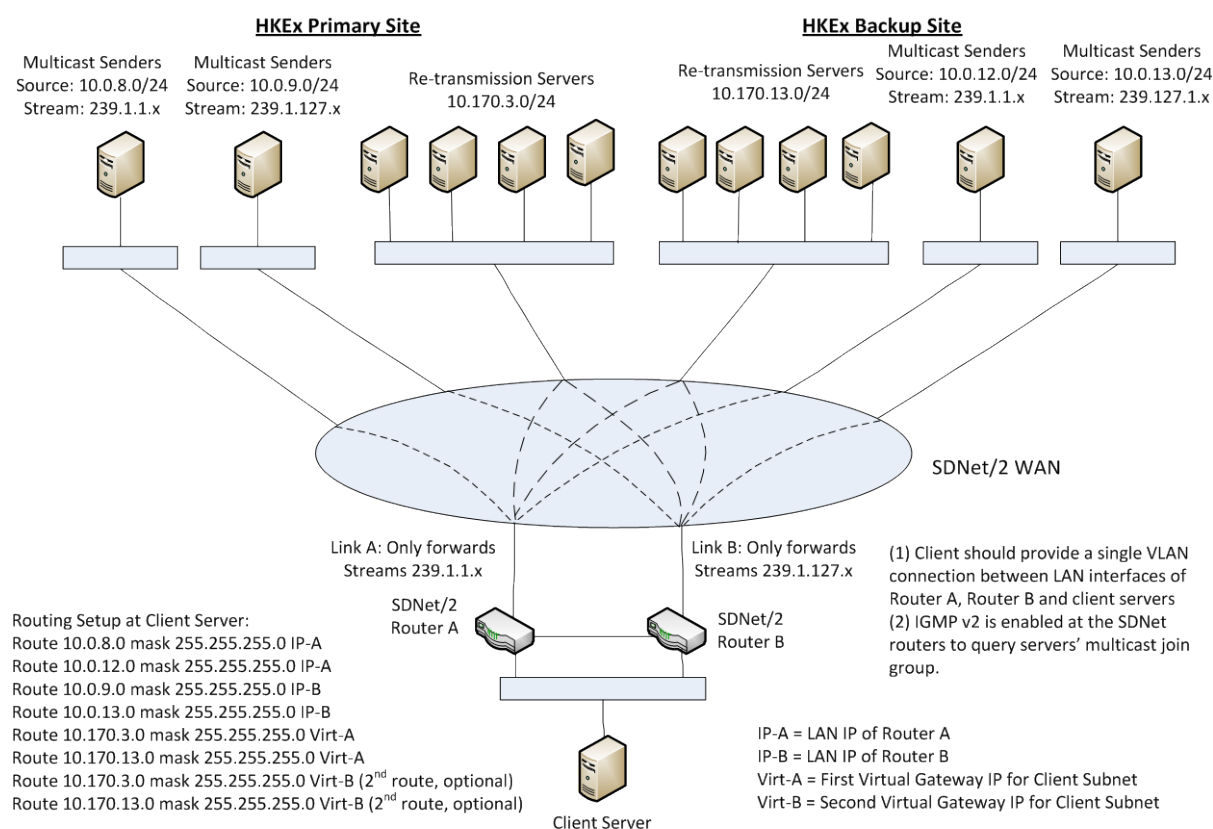
1. OMD-D Readiness Test Environment (“OMD-D RT Environment”)

- 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:



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

Derivatives Non-SOM Level 2 Price and COP (Partition 1)	Calculated Opening Price (364)	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)	Calculated Opening Price (364)	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	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

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 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	Series Definition Base (303) Combination	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

Data Channel (Partition 2)	Definition (305)		51002	51002		51002	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 Statistic Channel	Trade Statistic (360)	172	A: 239.1.1.219: 51003 B: 239.1.127.219: 51003	A: 239.1.1.181: 51003 B: 239.1.127.181: 51003	672	A: 239.1.1.240: 51003 B: 239.1.127.240: 51003	A: 239.1.1.202: 51003 B: 239.1.127.202: 51003
Derivatives 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

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

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 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	Quote	164	A: 239.1.1.218:	A: 239.1.1.180:			

Non-SOM Quote Request Channel	Request (336)		51005 B: 239.1.1.127.218: 51005	51005 B: 239.1.1.127.180: 51005			
Non-SOM Open Interest Channel	Open Interest (366)	191	A: 239.1.1.1.227: 51001 B: 239.1.1.127.227: 51001	A: 239.1.1.1.189: 51001 B: 239.1.1.127.189: 51001	691	A: 239.1.1.1.248: 51001 B: 239.1.1.127.248: 51001	A: 239.1.1.1.210: 51001 B: 239.1.1.127.210: 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: 239.1.1.1.224: 51001 B: 239.1.1.127.224: 51001	A: 239.1.1.1.186: 51001 B: 239.1.1.127.186: 51001	631	A: 239.1.1.1.245: 51001 B: 239.1.1.127.245: 51001	A: 239.1.1.1.207: 51001 B: 239.1.1.127.207: 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: 239.1.1.1.224: 51002 B: 239.1.1.127.224: 51002	A: 239.1.1.1.186: 51002 B: 239.1.1.127.186: 51002	731	A: 239.1.1.1.245: 51002 B: 239.1.1.127.245: 51002	A: 239.1.1.1.207: 51002 B: 239.1.1.127.207: 51002
Derivatives Non-SOM Trade Adjustment Channel	Trade (350) Trade Amendment (356)	167	A: 239.1.1.1.236: 51000 B: 239.1.1.127.236: 51000	A: 239.1.1.1.198: 51000 B: 239.1.1.127.198: 51000			
Derivatives Non-SOM Series Statistic Channel	Series Statistics (363)	174	A: 239.1.1.1.224: 51003 B: 239.1.1.127.224: 51003	A: 239.1.1.1.186: 51003 B: 239.1.1.127.186: 51003	674	A: 239.1.1.1.245: 51003 B: 239.1.1.127.245: 51003	A: 239.1.1.1.207: 51003 B: 239.1.1.127.207: 51003
Derivatives Non-SOM Market Alert Channel	Market Alert (323)	177	A: 239.1.1.1.232: 51000 B: 239.1.1.127.232: 51000	A: 239.1.1.1.194: 51000 B: 239.1.1.127.194: 51000	677	A: 239.1.1.1.253: 51000 B: 239.1.1.127.253: 51000	A: 239.1.1.1.215: 51000 B: 239.1.1.127.215: 51000
EAS Channel	EAS Price (365)	199	A: 239.1.1.1.229: 51000 B: 239.1.1.127.229: 51000	A: 239.1.1.1.191: 51000 B: 239.1.1.127.191: 51000	699	A: 239.1.1.1.250: 51000 B: 239.1.1.127.250: 51000	A: 239.1.1.1.212: 51000 B: 239.1.1.127.212: 51000
Implied Volatility	Implied Volatility (367)	194	A: 239.1.1.1.231: 51000	A: 239.1.1.1.193: 51000	694	A: 239.1.1.1.252: 51000	A: 239.1.1.1.214: 51000

Channel	B: 239.1.127.231: 51000	B: 239.1.127.193: 51000		B: 239.1.127.252: 51000	B:239.1.127.214: 51000
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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
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: 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)	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

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	Multicast Channel Subscriptions

I ID							
			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)	101	A: 239.1.1.218: 51001	A: 239.1.1.180: 51001	601	A: 239.1.1.239: 51001	A: 239.1.1.201: 51001
	Combination Definition (305)		B: 239.1.127.218: 51001	B: 239.1.127.180: 51001		B: 239.1.127.239: 51001	B: 239.1.127.201: 51001
Derivatives Non-SOM Series Definition Reference Data Channel (Partition 2)	Series Definition Base (303)	201	A: 239.1.1.218: 51002	A: 239.1.1.180: 51002	701	A: 239.1.1.239: 51002	A: 239.1.1.201: 51002
	Combination Definition (305)		B: 239.1.127.218: 51002	B: 239.1.127.180: 51002		B: 239.1.127.239: 51002	B: 239.1.127.201: 51002
Derivatives Non-SOM Series Definition Reference Data Channel	Commodity Definition (301)	151	A: 239.1.1.218: 51003	A: 239.1.1.180: 51003	651	A: 239.1.1.239: 51003	A: 239.1.1.201: 51003
	Class Definition (302)		B: 239.1.127.218: 51003	B: 239.1.127.180: 51003		B: 239.1.127.239: 51003	B: 239.1.127.201: 51003
	Series Definition Extended (304)						
Derivatives Non-SOM Series & Market Status Channel	Market Status (320)	161	A: 239.1.1.218: 51004	A: 239.1.1.180: 51004	661	A: 239.1.1.239: 51004	A: 239.1.1.201: 51004
	Series Status (321)		B: 239.1.127.218: 51004	B: 239.1.127.180: 51004		B: 239.1.127.239: 51004	B: 239.1.127.201: 51004
	Commodity Status (322)						
Derivatives Non-SOM Quote Request Channel	Quote Request (336)	164	A: 239.1.1.218: 51005	A: 239.1.1.180: 51005			
			B: 239.1.127.218: 51005	B: 239.1.127.180: 51005			
Derivatives Non-SOM Order, COP and Trade (Partition 1)	Calculated Opening Price (364)	121	A: 239.1.1.222: 51001	A: 239.1.1.184: 51001	621	A: 239.1.1.243: 51001	A: 239.1.1.205: 51001
	Add Order (330)		B: 239.1.127.222: 51001	B: 239.1.127.184: 51001		B: 239.1.127.243: 51001	B: 239.1.127.205: 51001
	Modify Order (331)						
	Delete Order (332)						
	Orderbook						

	Clear (335)					
	Trade (350)					
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

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	Commodity Definition	152	A: 239.1.1.217: 51003	A: 239.1.1.179: 51003	652	A: 239.1.1.238: 51003	A: 239.1.1.200: 51003

Reference Data Channel	(301) Class Definition (302) Series Definition Extended (304)		B: 239.1.127.217: 51003	B: 239.1.127.179: 51003		B: 239.1.127.238: 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 (Partition 1)	Calculated Opening Price (364) Add Order (330) Modify Order (331) Delete Order (332) Orderbook Clear (335) Trade (350)	122	A: 239.1.1.221: 51001 B: 239.1.127.221: 51001	A: 239.1.1.183: 51001 B: 239.1.127.183: 51001	622	A: 239.1.1.242: 51001 B: 239.1.127.242: 51001	A: 239.1.1.204: 51001 B: 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
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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 Channel (Partition 1)	Trade (350)	111	A: 239.1.1.234:51001 B: 239.1.127.234:51001	A: 239.1.1.196:51001 B: 239.1.127.196:51001	N/A	
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	

			02	02	
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

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 - <i>for OMD-D Readiness Test, Practice Session, Open Test</i>	
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 - <i>for EPs to perform End-to-end Loop Test with HKATS</i>	
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.

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).

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:-

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.

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.

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.

Initially, 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)

Price of SDNet/2 Circuit

SDNet/2 services are provided by the Accredited Vendors directly to EPs/CPs/IVs. EPs/CPs/IVs shall apply the services and engage into commercial agreements with the Accredited Vendors directly. However, all Accredited Vendors shall offer SDNet/2 services to EPs/CPs/IVs according to a capped price scheme. Accredited Vendors should offer SDNet/2 services to EPs/CPs/IVs with prices not higher than the capped prices. Prices are applicable to both production circuits and testing circuits.

Note: *All prices provided in this information package are capped price for reference only. EPs/CPs/IVs are advised to contact the respective Accredited Vendors for more information on prices and subscription terms.*

a. One-time Charge for New Circuit Installation

There is no one-time charge for installation of new SDNet/2 circuit.

b. Monthly Charge for Circuit Rental

The following table shows the capped prices of different bandwidth ranges by each Accredited Vendor for circuit rental:

Bandwidth	Capped Price of Monthly Charge for Circuit Rental by Accredited Vendors (per single circuit) ³		
	PCCW	HGC	Wharf T&T
1M Circuit	≤ HK\$1,300		
2M Circuit	≤ HK\$1,900		
3M Circuit	≤ HK\$2,400		
4M Circuit	≤ HK\$2,900		
5M Circuit	≤ HK\$3,000		
6M Circuit	≤ HK\$3,100		
7M Circuit	≤ HK\$3,200		
8M Circuit	≤ HK\$3,300		
9M Circuit	≤ HK\$3,400		

³ Prices are on a per circuit basis. A dual-circuit configuration will cost 2 times the cost of a single circuit.

10M Circuit	≤ HK\$3,500		
20M Circuit	≤ HK\$4,500		
30M Circuit	≤ HK\$7,040	≤ HK\$7,800	≤ HK\$5,850
40M Circuit	≤ HK\$8,360	≤ HK\$8,600	≤ HK\$6,750
50M Circuit	≤ HK\$9,680	≤ HK\$9,400	≤ HK\$7,650
60M Circuit	≤ HK\$10,900	≤ HK\$10,200	≤ HK\$7,880
70M Circuit	≤ HK\$12,100	≤ HK\$11,000	≤ HK\$8,410
80M Circuit	≤ HK\$13,300	≤ HK\$11,800	≤ HK\$8,940
90M Circuit	≤ HK\$14,600	≤ HK\$12,700	≤ HK\$9,470
100M Circuit	≤ HK\$15,800	≤ HK\$14,000	≤ HK\$10,000
1G Circuit	≤ HK\$42,200	≤ HK\$32,000	≤ HK\$15,000

c. One-time Charge for Circuit Bandwidth Upgrade/Downgrade/Relocation

The following table shows the charges by each Accredited Vendor for circuit bandwidth upgrade / downgrade / internal relocation / external relocation:

Service	Capped Price of One-time Charge by Accredited Vendors (per circuit)		
	PCCW	HGC	Wharf T&T
Circuit Bandwidth Upgrade /Downgrade ⁴ Charge	HK\$1,500	Free	Free
Internal Relocation ⁵	HK\$1,500	HK\$1,500	HK\$1,500
External Relocation	1M – 20M:	HK\$5,000	HK\$5,000
	30M – 100M:	HK\$17,760	
	1G:	HK\$44,400	

d. Minimum Subscription Period and Termination Notice

For all SDNet/2 circuits, a minimum subscription period and advance termination notice is applicable.

Minimum Subscription Period	3 months
Advance Termination Notice	1 month

⁴ Circuit bandwidth downgrade may involve contract termination and should subject to related clauses in the contract agreement between EPs/CPs/IVs and the Accredited Vendors

⁵ Relocation of circuit within the same building

e. SDNet/2 for HKEx Orion Market Data (OMD) Platform

To support OMD streaming feeds, SDNet/2 comes with a High Performance Option, where the circuits can support high data throughput required by the new application. The table below shows the capped prices of different bandwidth ranges of the High Performance Option for reference. Should EPs/CPs/IVs have interested in OMD streaming feeds for cash or derivatives market, more information will be available in HKEx's website in due course.

Bandwidth	Capped Price of Monthly Charge for Circuit Rental by Accredited Vendors (per circuit)		
	PCCW	HGC	Wharf T&T
30M Circuit	≤ HK\$10,560	N/A	≤ HK\$6,410
40M Circuit	≤ HK\$12,540	N/A	≤ HK\$7,310
50M Circuit	≤ HK\$14,520	N/A	≤ HK\$8,210
60M Circuit	≤ HK\$16,350	N/A	≤ HK\$8,440
70M Circuit	≤ HK\$18,150	N/A	≤ HK\$8,970
80M Circuit	≤ HK\$19,950	N/A	≤ HK\$9,500
90M Circuit	≤ HK\$21,900	N/A	≤ HK\$10,030
100M Circuit	≤ HK\$23,700	N/A	≤ HK\$10,560
1G Circuit	≤ HK\$63,300	N/A	≤ HK\$15,560

Appendix B Sample Client Configuration Information

Client End Network Information (Sample):

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

Host End Network Information (Sample):

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

