



Information Package

for

Exchange Participants, Information Vendors, Technology Vendors, Network
Service Providers, and other services providers

on

HKEx Hosting Services

Version 1.1

8 May 2012

Modification History

Version	Date	Modified by	Description and reason for modification
1.0	19/03/2012	Hosting services	First release version
1.1	08/05/2012	Hosting Services	Modify wordings in page 5, 6, 7, 8, 16 and 31. Modify a typo in page 26. Enrich the Accessories list and payment billing notes in Service offerings. Enrich the Annex (1) Key features, differences, and specifications of the hosting Open Gateway (OG) for HKEx Hosting Services

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1 Introduction

Hong Kong Exchanges and Clearing Limited (HKEx) is pleased to announce that Hosting Services will be offered in its Next Generation Data Centre (NGDC) in Hong Kong's Tseung Kwan O Industrial Estate.

HKEx Hosting Services will further support Hong Kong's financial markets community using an ecosystem approach. HKEx Hosting Services will be made available to HKEx Exchange Participants (EPs) as well as HKEx authorised Information Vendors (IVs), Technology Vendors (TVs), Network Services Providers (NSPs) and other service providers who will be able to interact within the ecosystem. This will allow infrastructure and software provisioning by hosted technology vendors.

Access to the Securities trading is planned to be rolled out in Q4 2012 with the Derivatives Market coming on line in Q2 2013 and Securities Clearing and Settlement systems live in Q4 2013.

Up to 1,200 racks of server space at an average power allocation of 6kVA per cabinet will be made available in phased releases. 320 racks will be ready for service in September 2012.

This information Package is prepared to provide the interested parties with:

- 1) Overview of HKEx Hosting Services;
- 2) Technical features of HKEx Hosting Data Centre (HDC);
- 3) HKEx Hosting Services operations highlights;
- 4) HKEx Hosting Service offerings; and
- 5) Enrolment procedures

A series of briefing sessions will be held in March and April 2012 to brief interested parties about the Services. HKEx Hosting is pleased to discuss with interested party to facilitate the more in-depth understanding of the Services.

2 Overview of HKEX Hosting Services

“A top-tier Hosting Services Ecosystem supporting Hong Kong’s Financial Marketplace”

HKEx HDC will be ready for service in September 2012. The key value propositions for subscribers are as below:

- Purpose-built data centre provides the high standard of security, access, power and cooling. HKEx HDC is designed to meet Tier-4 specification. In addition, HKEx HDC will be ecologically friendly and LEED Gold Rating compliant.
- Low latency access to Cash & Derivatives Markets
- Low latency direct market data feeds
- An open accessibility concept enables and accelerates the development of an ecosystem of EPs, IVs, TVs, NSPs, and other service providers, creates a high value financial “Marketplace”.
- Flexible power and space packages offering both racked and caged environments.
- Carrier neutral and availability of wide choice of network service providers

2.1 Eligible Subscribers for HKEx Hosting Services

The key subscribers eligible to use the Services are as follows:

2.1.1 Exchange Participants (Securities & Derivatives)

EPs can use the Services to reduce network latency, increase network predictability and consistency, obtain faster access to domestic and international market data feeds; and access hosted technology vendor solutions.

2.1.2 Information Vendors

IVs can enjoy faster access to HKEx market data systems for the Securities and derivatives markets. Furthermore, IVs can also implement their services within the HDC in order to provide higher speed and low latency domestic and international market data feed services to their customers including EPs located at HDC. IVs should note relevant market data policies to be introduced for Hosting Services subscribers.

2.1.3 Technology Vendors

TVs can set up their infra-structure in HDC to provide Software as a Service (SaaS), Broker Supplied Systems (BSS) and Order Management Systems (OMS) solution to their customers at a stable and low latency environment.

2.1.4 Network Service Providers

NSPs can set up their point of presence in HDC to offer wide range of domestic and international connectivity services to all subscribers hosted in HDC.

2.1.5 Other Service Providers

Other value added service providers, such as Infrastructure as a Service (IaaS) providers, would also implement their own solution centres within the exchange hosting services facility and offer services to the EPs.

2.2 Major Milestones

	Tentative Timeline
Information Briefing	Mar-Apr 2012
Express of Interest Process	Apr-May 2012
Rack allotment Process	June 2012
Subscriber move-in to Hosting Services Data Centre for equipment installation and configuration	Sep-Nov 2012
AMS/3.8 and MDS/3.8 ready for services in NGDC	Oct 2012
End-to-end AMS/3.8 and MDS/3.8 commissioning tests	Oct-Nov 2012 (Saturdays of 27 Oct, 10 Nov, and 24 Nov)
Hosting Services Production Launch	Dec 2012
Hong Kong Futures Automatic Trading System (HKATS), Derivative Clearing and Settlement System (DCASS), Price Reporting System (PRS), and Price Reporting System Plus (PRS+) move-in and ready for services in NGDC	Q2 2013
Central Clearing and Settlement System (CCASS) move-in and ready for services in NGDC	Q4 2013

2.3 Hosting Services – Rack Configurations

HKEx Hosting offers flexible rack and power configurations for subscriber. We provide half rack, full rack, and cage options to address different hosting requirements.

Half Rack

- Power Options: 2kVA or 3kVA per half rack
- 22U x 1175 mm (1100 mm effective) deep x 800 mm wide (19” mounting rails) with default allocation of one fixed shelves
- Electrical power is delivered via two vertical power strips connecting to separate A & B feeds with the following specifications:
- 32A @220V power feeds
- 8-way BS1363 UK socket power strips

Full Rack

- Power Options: 4kVA or 6kVA per rack
- 47U x 1175 mm (1100 mm effective) deep x 800 mm wide (19” mounting rails) with default allocation of two fixed shelves
- Electrical power is delivered via two vertical power strips connecting to separate A & B feeds with the following specifications:
- 32A @220V power feeds
- 12-way BS1363 UK socket power strips

Cage

- Minimum configuration is 2 rows of 4 full racks (8 full rack in total)
- Power Options: 4kVA or 6kVA per rack
- 47U x 1175 mm (1100 mm effective) deep x 800 mm wide (19” mounting rails) with default allocation of two fixed shelves

Remarks for Rack Configurations

- Two patch panels are installed in each half or full rack which occupy 2U rack space at the top of the rack/half rack. HKEx Hosting may install additional patch panels as services are provisioned.
- Front and Rear doors are of standard perforated doors. Perforations limit the visibility in the racks.
- All racks include mechanical locks.
- Subscriber with contiguous racks is allowed to patch devices through inside passage between these racks.
- When subscriber with non-contiguous racks wants to patch devices between

these separate racks, the cabling shall be carried out by HKEx Hosting with fee charged.

2.4 HKEx Hosting Connectivity Services

Connectivity between ecosystem members will be provisioned by the following networks:

- HKEx Service Network (HSN) will connect eligible subscribers to HKEx market data, trading and clearing systems. HSN is able to support consolidated connection to HKEx systems at 100M/1G/10G speed options.
- Ecosystem Network (ESN) will allow subscriber to access services provided by other ecosystem members.
- Cross Connects (XCN) will connect subscriber with other ecosystem members by using fiber or copper cable.

2.4.1 Technical Specifications for HSN and ESN

2.4.1.1 Physical Interface

HKEx Hosting provides the following physical interface types:

Physical Interface Specification	Data Rate	Support Interface
	100Mbit/s	SFP 100BASE-FX; LC connector; 1310nm; 2km reach on multimode fiber
	1000Mbit/s	SFP 1000BASE-SX; LC connector; 850nm; 550m reach on multimode fiber
	10Gbit/s	SFP+ 10GBASE-SR 10 Gigabit Ethernet Optics, 850 nm for up to 300 m transmission on multimode fiber (MMF)

2.4.1.2 Network Protocol

Ethernet switch in subscriber end shall support the following network protocols:

Protocol specification

Routing Protocol	BGP4
Multicast Protocol	PIM, IGMP
VLAN Tagging	802.1Q

2.4.1.3 IP addressing

Subscriber must use private Class C IP address provided by HKEx Hosting when connecting to HKEx trading systems or other subscribers. Such IP address block will be managed and assigned by HKEx Hosting to subscriber during service provisioning. Subscriber can use his own IP address to connect to the NSPs systems or any system within their own rack(s).

2.4.1.4 Security Policy

HKEx Hosting implements the following security controls to minimize the risk of unauthorized access to HSN and ESN:

- Routing policy filtering will be applied between HSN and subscriber devices
- Both incoming and outgoing unicast data streams are examined by firewalls in HSN.
- Multicast and Unicast IP filtering will be applied in the aggregation switch in HSN.
- For ESN, only subscribers within a virtual group can communicate with each other.

2.4.2 HKEx Service Network (HSN)

Eligible subscribers can connect to HKEx trading systems including AMS/3.8 and HKATS and market data systems for securities and derivatives markets (e.g. MDS/3.8 and PRS) via HSN. Port speed at 100Mbps, 1Gbps, and 10Gbps are available. HKEx Hosting provides dual network fiber ports (active and standby mode) which are connected to the subscriber rack patch panel demarcation. Equidistant cross connects are implemented to ensure practically same latency to all subscribers regardless of the rack location within HDC.

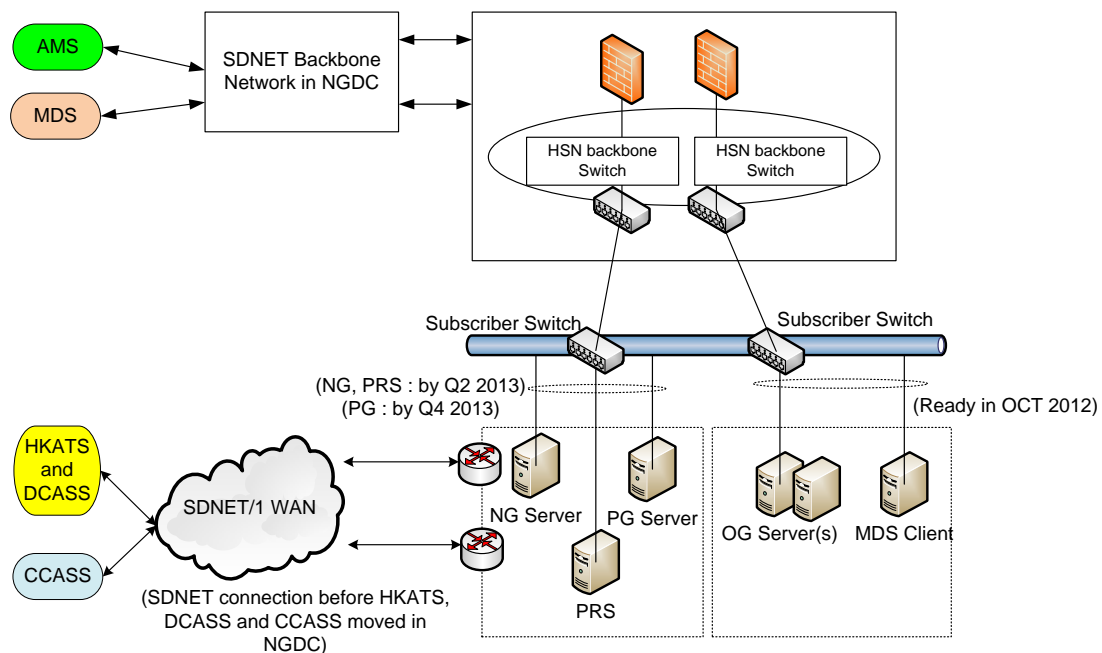
Connection to AMS/3.8 and MDS/3.8 is only available to the relevant EPs and IVs respectively.

Connection to HKATS, PRS and PRS+ through HSN will be available in Q2 2013 after the systems are migrated to NGDC, prior to that subscriber can only use SDNET/1 to connect to those systems.

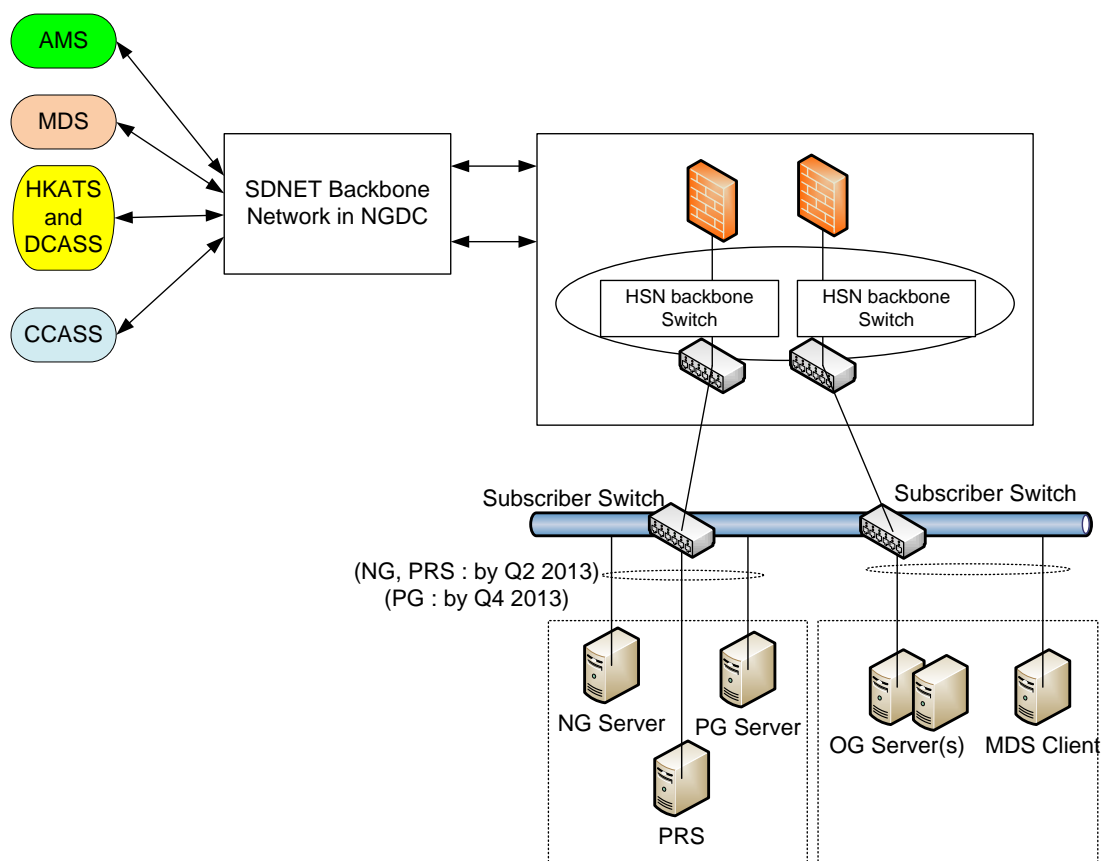
HKEx systems will move in HKEx NGDC at the below tentative schedule:



The high level network configuration after AMS and MDS go-live in NGDC in October 2012 is shown in the following diagram:



The high level network configuration after HKATS, DCASS, and CCASS go-live in NGDC in Q4 2013 is shown in the following diagram:



HSN Connection to AMS/ 3.8

Subscribers shall provide their own switch(s) for Open Gateway connection(s). It is strongly recommended that 2 switches shall be provided for resilience purpose.

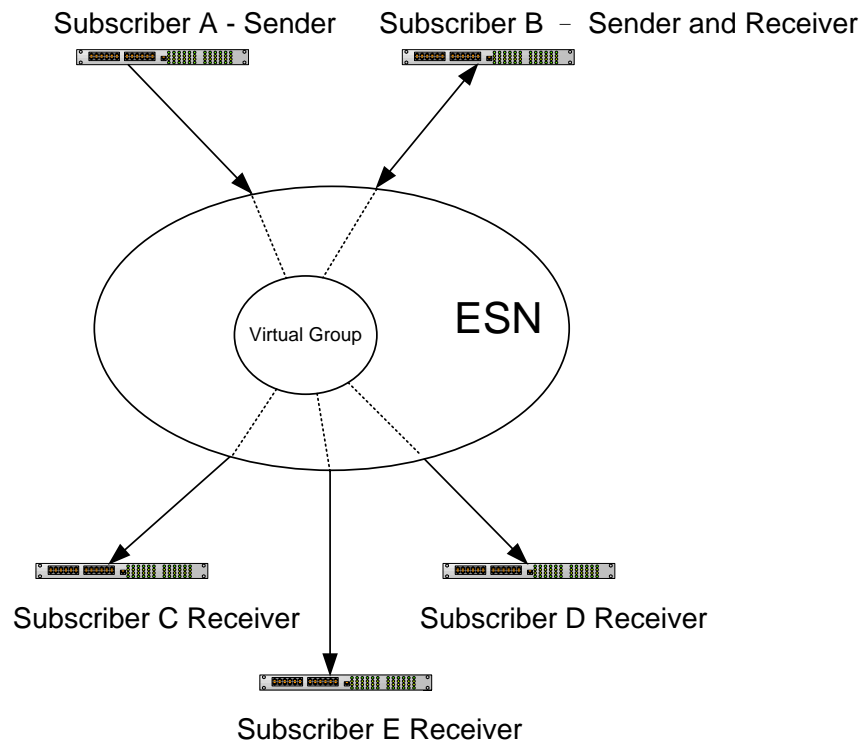
HSN Connection to MDS/3.8

Eligible subscribers can connect to MDS system through HSN. HKEx Hosting will provide different VLAN number for the subscriber such that traffic will be isolated from AMS network in subscriber end. It should be noted that all MDS clients should use the HKEx Hosting assigned IP address to connect to HKEx trading system.

2.4.3 Ecosystem Network (ESN)

Ecosystem Network (ESN) will allow subscribers to access services provided by other ecosystem members.

By using the IP address provided by HKEx Hosting, subscribers can communicate with each other within a virtual group managed by HKEx Hosting.

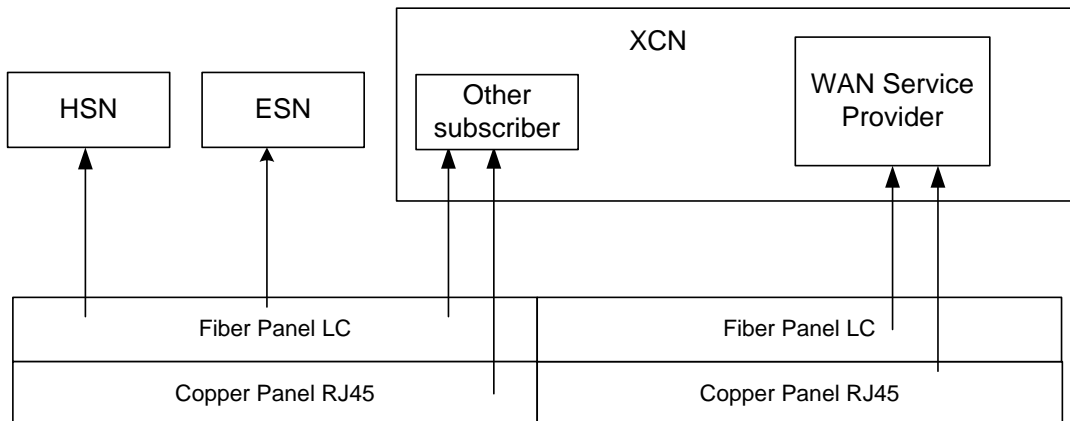


2.4.4 Cross Connects (XCN)

Cross Connects (XCN) will connect subscribers with other ecosystem members by using fiber or copper cable.

2.4.5 Demarcation for Connectivity Services

HKEx Hosting offers network patch panels which will occupy 2U rack space in each subscriber rack. All HKEx Hosting Connectivity Services will be provisioned in the network patch panels. Both HSN and ESN will be delivered through multimode fiber ports. Subscriber rack-to-rack cross connects (XCN) to other ecosystem member(s) will be delivered in copper and/or multi-mode fiber port(s). Connections from these patch panels to subscriber equipment are the responsibility of the subscriber. HKEx Hosting is not responsible for the provision of switch(s) and cables connecting subscriber equipment to the network patch panels in subscriber rack.



2.4.6 Open Gateway (OG) arrangement for Hosting Services

A new option of hosting OG will be provided for EPs to more effectively utilize the Hosting Services rack space. The key features and differences of the new hosting OG are highlighted and outlined in Annex [1].

2.5 Remote Hands Services

These are technical support services initiated, directed and guided by the subscriber, performed by HKEx Hosting. The scope of services include the followings:

- Equipment power cycling (router, server, switch);
- Checking equipment LEDs for activity;
- Visual inspections of equipment.

2.6 Timing Services

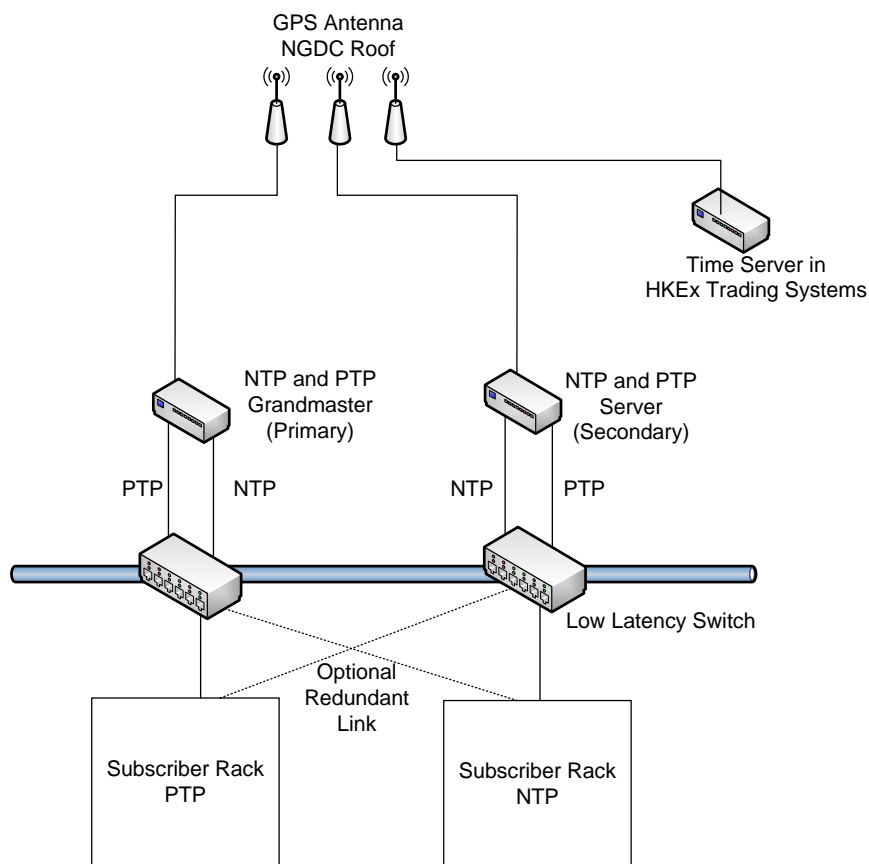
HKEx Hosting provide a high precision time sync service via Network Time Protocol (NTP) (V4 RFC5905) and Precise Time Protocol (PTP) (IEEE 1588). The service is provisioned via a dedicated UTP port terminated at the subscriber rack.

In order to provide resilience, 2 time servers with NTP and PTP will be installed in HDC with each time server connected to a separate switch. One UTP link will be provisioned to the subscriber rack and depending on the services subscribed it can provide both NTP and PTP clock sources. Subscriber can subscribe additional port which is connected to

other switch for resilience purpose.

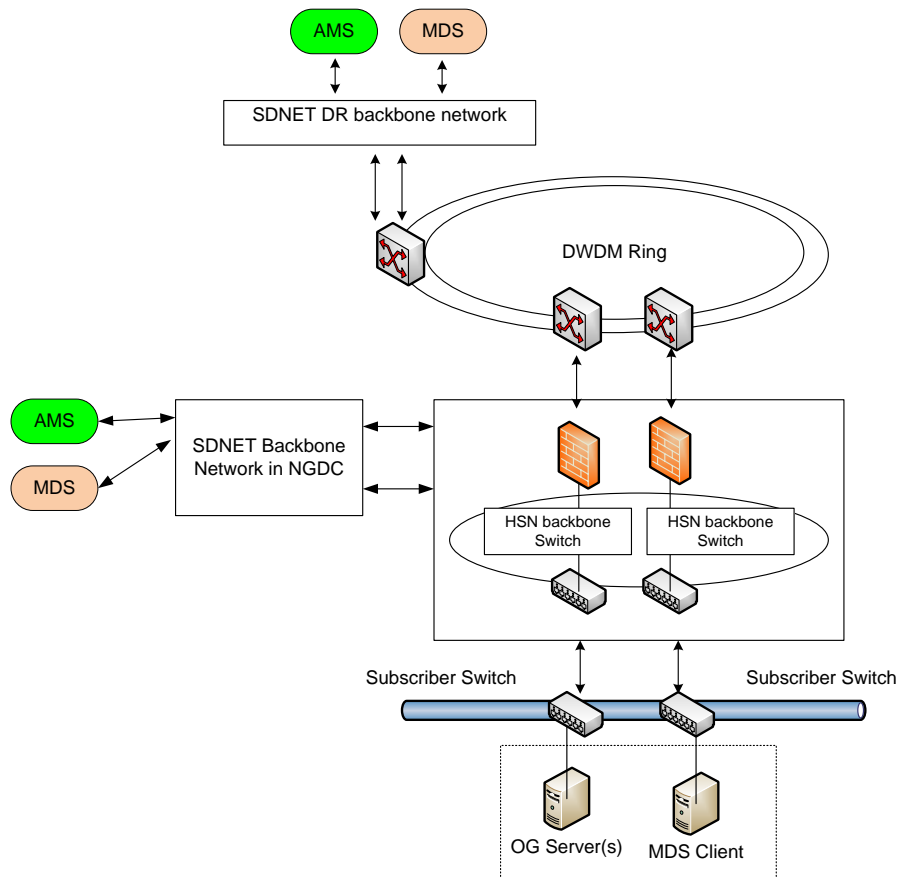
The provided clock will be stratum 1 for NTP while the PTP clock source will be the grandmaster clock.

Time server in HKEx Trading Systems network will be installed in HKEx Enterprise Data Centre which is in the same NGDC building and the GPS antenna will be mounted just next to the Hosting Services GPS antennas in the roof top.



2.7 Disaster Recovery (DR) Connectivity

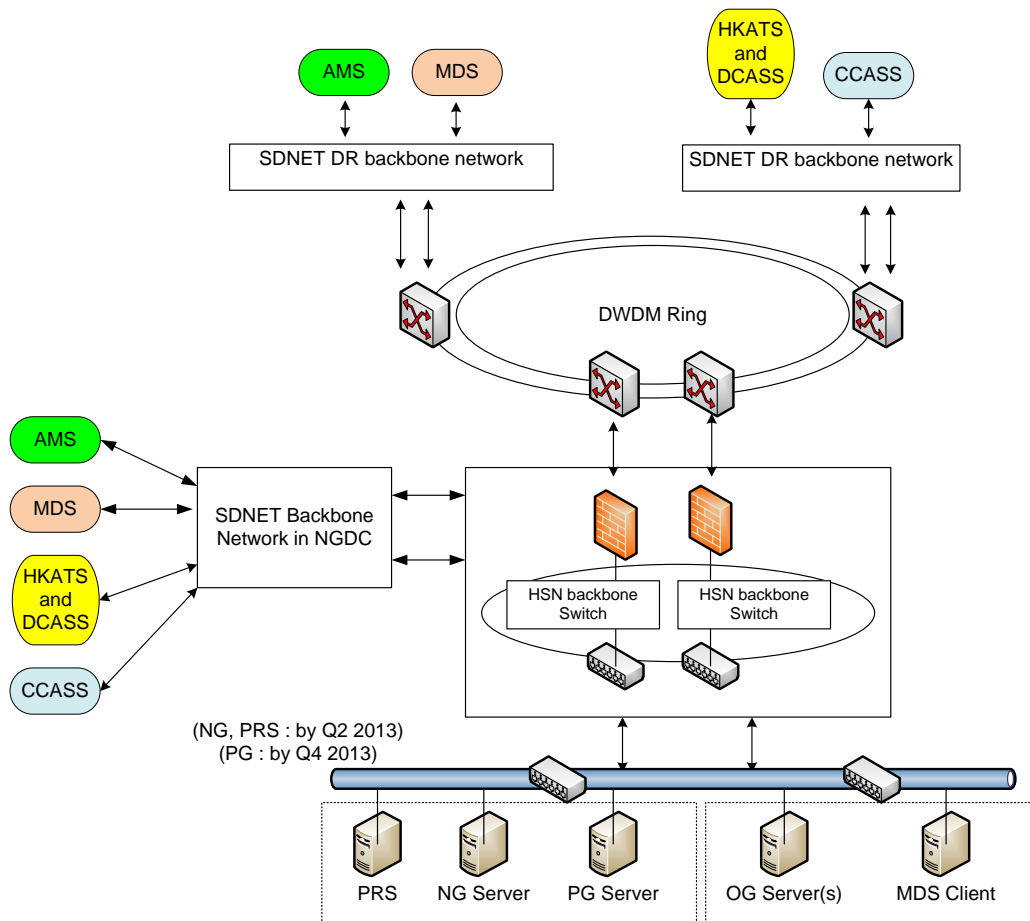
Dual Dense Wavelength Division Multiplexing (DWDM) rings are built to link HDC with the HKEx AMS and MDS DR sites as shown in the following diagram;



These DWDM rings will provide connectivity to AMS/3.8 and MDS/3.8 DR systems when the following failure(s) occurred:

- AMS/3.8 in NGDC system failure
- MDS/3.8 in NGDC system failure
- SDNET backbone in NGDC failure
- Enterprise Data Centre in NGDC outage, including but not limited to power and cooling outage

The high level network configuration after HKATS, DCASS, and CCASS go-live in Q4 2013 is shown in the following diagram:



HKEx Hosting does not provide disaster recovery facility at the HKEx DR sites which are for HKEx internal use, it is subscriber's sole responsibility in the provision of adequate business continuity and disaster recovery arrangements in relation to the subscribed hosting services including, where applicable, maintaining alternative means and location of access to the trading, clearing and settlement systems and/or the market data dissemination systems of the HKEx Group

Low voltage power is split into three categories:

- Critical IT Load – Uninterrupted Power Supply (UPS) backed Hosting Data Hall equipment rack and server power
- Critical Mechanical Load – Chilled water pumps, Computer Room Air Conditioning (CRAC) units, auxiliary cooling units are supported by separate mechanical UPS system
- Essential – office power and cooling

Three categories of power are generator backed. IT racks and critical mechanical systems are UPS backed.

For critical IT loads, 2N UPS systems deliver power to the Hosting Data Hall, two systems running as dual source A and B and UPS modules are connected in a parallel configuration. Each UPS module 500kVA is fitted with a battery autonomy time of 15 minutes at full load.

Static Transfer Switch are installed and supplied by both A and B feed and then feed to Power Distribution Unit (PDU). Each rack is supplied with two feeds each from different side of PDUs. Power density of each rack is designed for 4kVA and up to 6kVA in maximum.

3.3 Cooling

Roof chiller plant contains 2N chilled water supply and delivered to the dual chilled water coil CRAC units through dual risers serving data centre. Thermal tanks are provided to support for total 15 minutes in N+1 configuration.

Cooling of the Hosting Data Hall is provided by dual coil chilled water CRAC units. Normally the CRAC units are running with either chilled water A or B supply. Supply air control is adopted for each CRAC unit to maintain environmental condition in cold aisle containment. All CRAC units are running in N+2 configuration. Moreover, supplementary top cooling units are provided to cater for 6kVA load per each rack.

3.4 Fire Protection System

Hosting Data Hall is protected via a fully addressable fire alarm system with smoke detectors. Fire suppression system is an environmental friendly NOVEC 1230 gaseous system. In addition, we have the pro-active aspiration system to detect the fire in the very early stage.

3.5 Building Management System (BMS)

All critical equipment is monitored by the BMS system with 24 hours monitoring and attendance.

3.6 Security

The Hosting Data Hall is controlled by the access control system. All main entrances and corridors are monitored by the CCTV system with recording images.

3.7 Telecommunication

There are two TBE rooms together with Telco lead in. Separate risers from TBE rooms to HDC Telco room are provided.

4 Operation Highlights

4.1 Subscriber Registration

The subscriber is required to register its personnel on a list to be held by HKEx Hosting. The list shall define clearly which individuals have the authority to:

- make changes to the list;
- authorize access of themselves or other parties acting on their behalf into the subscriber rack;
- make requests to HKEx Hosting for work to be undertaken within the subscriber rack; and
- gain access to the HDC.

4.2 Service Provisioning and Lead-time

The provisioning process for a standard order usually takes 14 calendar days from the time an order is confirmed and accepted by HKEx Hosting.

Estimated Lead Time of Service Provisioning	
Racks	14 calendar days, subject to rack availability
Cage	8-12 weeks
Connectivity Services HSN, ESN and XCN. See Note [1] below	14 calendar days See Note [2] below
Accessories	14 calendar days
Timing Services	14 calendar days

Note [1]: Subscribers who are interested in acquiring hosting OG for connection to AMS/3.8 via HSN need to arrange the procurement of hardware and software packages for their hosting OG; and the installation with one of the appointed service vendors for installation (see Annex 1) directly. At the same time, subscribers need to inform Trading Division of HKEx separately on throttle assignment of hosting OG.

Note [2]: Production roll-out of hosting OG is subject to separate arrangements and lead times, such as OG installation by certified service vendor, successful completions of required commissioning tests and Saturday's rehearsal, submission of BSS Readiness Declaration and Standard Terms and Conditions.

4.3 Equipment Delivery and Receiving

- Subscriber equipment deliveries to HDC are subject to a written request by the subscriber and HKEx Hosting's prior written consent to such request at least 2 business days in advance of such delivery.
- Subscriber shall provide HKEx Hosting with the following details of the delivery of subscriber equipment:
 - courier company name;
 - estimated delivery schedule;
 - quantity of goods being delivered;
 - brief description of goods being delivered including but not limited to size and weight; and
 - name(s) (if any) of Subscriber representative(s) on-site to receive delivery.

4.4 Equipment Installation

Subscriber shall provide HKEx Hosting with at least prior notice of 2 business days and seek HKEx Hosting prior approval if it intends to access the subscriber rack to install and connect any equipment which will be generally permitted only outside normal HKEx Trading Hours.

A communal staging area will be available at the HDC for the subscriber equipment configurations and testing before installation into the subscriber rack. Use of the staging area must be coordinated with the HKEx Hosting with at least 2 business days prior written request and approval.

4.5 Disposal of Waste Materials

Subscribers are required to arrange the removal of any waste materials, such as packaging materials, debris or rubbish created by the subscriber's works, on the same day of subscriber equipment unpacking for configurations or installation.

4.6 Subscriber Visitation and Access to the HDC

HDC may be entered by the subscriber only for the purposes of carrying out legitimate works in connection with the agreement. Generally the following Subscriber Visitation and Access policies

apply:-

- Subscriber personnel may enter the HDC only with the prior explicit approval of HKEx Hosting (which shall not be unreasonably withheld).
- All requests for access to the HDC shall be made to HKEx Hosting in writing at least 1 business day before such access is required, unless HKEx Hosting consents to any shorter notice period.
- The request for accessing the HDC should include:
 - name(s) and other particulars of the subscriber personnel seeking access, including company name;
 - purpose of the access/work request;
 - expected duration of access/task;
 - time and date access/work is required; and
 - notification and information regarding any planned subscriber equipment arrival and/or removal from the HDC.
- Entry into the HDC shall be subject to multiple levels of security screenings, including at the building perimeter entry gate, and building reception. Upon arriving at the entry gate, the subscriber personnel shall present his name, company information and valid ID to the security operator. The security operator will verify whether the subscriber personnel is expected. Unexpected subscriber personnel will not be granted access to the HDC. Subscriber personnel with permitted access will be guided to the building reception where detailed check-in verification procedure for the HDC access will be carried out. Upon successful check-in, the subscriber personnel will be issued with an access badge.
- The subscriber personnel's bags and packages will be subject to visual inspection and electronic security inspections (magnetometer, x-ray, etc.) if deemed necessary by HKEx Hosting.
- An escort from HKEx Hosting will then accompany the subscriber personnel to the subscriber rack within HDC. Subscriber personnel activities will be under surveillance by HKEx Hosting throughout the entire duration of their visit. Subscriber personnel may not visit or stay in areas other than the subscriber rack. Upon completion of the visit to the subscriber rack, the subscriber personnel will be escorted back to the building reception area where the visit originated.

4.7 Use of Site Facility

4.7.1 Site Policies

Subscriber personnel should adhere to and abide by all security and safety measures established by HKEx Hosting and set forth in the Site Policies provided by HKEx Hosting to subscribers. The Site Policies sets forth the guidelines, principles, and requirements for using the HKEx HDC by the subscriber. These guidelines, principles and requirements will cover the following area.

- Subscriber's access to HKEx HDC;
- Subscriber's use of the HKEx HDC's facilities;
- Subscriber's conduct;
- HKEx Hosting's maintenance services;
- Supplemental Services; and
- Modification of Rules and Regulations

4.7.2 Locker Facility

Locker facility will be provided free of charge to subscribers to keep their personal belongings while inside the HDC subject to availability. Subscriber is responsible for maintaining the control of the locker key and for keeping the locker closed and locked. Upon leaving the Site, subscriber must return the locker key to HKEx Hosting Operations Command Centre's staff.

4.7.3 Emergency and Safety

The HKEx Hosting takes the health and safety of its employees and visitors seriously and maintain a high standard in the HDC. Should a subscriber be aware of a potential hazard, unsafe situation or unsafe working practice, they should communicate the hazard to the Operations Command Centre's staff immediately.

All accidents must be reported to the Operations Command Centre's staff who will take appropriate action. All subscribers are required to keep the work area in a tidy condition and must ensure that walkways are maintained free from obstruction.

4.8 Operational Support

4.8.1 Fault Reporting

HKEx Hosting has established a team of technical support personnel to provide round the-clock support services to the HKEx Hosting Services subscribers. You can contact our support team through the Service Desk.

For each fault report/operation request from subscriber, a ticket number will be created and communicated to the subscriber for future reference purpose.

4.8.2 Service Contacts

Service Desk/Operations Command Center/Technical Support

Email: [To be advised](#)

Phone: To be advised

Our Service Desk is available to assist you on the followings during 09:00 ~ 18:00 HKT, Monday to Friday excluding public holiday:

- Subscriber's personnel registration and general service support
- General inquiries
- Notification of maintenance events
- Appointments for equipment delivery/installation

The following services are available 7 days x 24 hours:

- Contact for fault reporting or remote hands
- Register for the access to the HDC

Sales and Business Development

Email: hostingservices@hkex.com.hk

Phone: +852 2211 6020

Our Business Development team is available to assist you with any sales inquiries

5 Service Offerings

Description	One Time Fee (HK\$)	Monthly Recurrent Fee (HK\$)
<i>RACK AND POWER</i>		
Half Rack with 2kVA power	15,000	17,500
Half Rack with 3kVA power	15,000	25,000
Full Rack with 4kVA power	30,000	35,000
Full Rack with 6kVA power	30,000	50,000
3 months option to reserve one concurrent Rack space	60,000	NA
Caged Full Rack with 4kVA power	30,000	43,750
Caged Full Rack with 6kVA power	30,000	62,500
Cage Set-up	Subject to quote	NA
<i>HKEx Service Network (HSN)</i>		
Pair of 100M port (active + backup)	10,000	6,000
Pair of 1G port (active + backup)	10,000	15,000
Pair of 10G port (active + backup)	10,000	30,000
<i>Ecosystem Network (ESN)</i>		
100M port (per Port)	5,000	1,500
1G port (Per Port)	5,000	3,500
10G port (Per Port)	5,000	8,000
<i>Cross Connect (XCN)</i>		
Cross connect (Fiber)	2,000	1,500
Cross connect (UTP)	2,000	1,500
<i>OTHER SERVICES</i>		
Remote hands service (per hour rate)	1,500	NA
ESN or HSN port reconfiguration	5,000	NA
Timing Service - NTP	5,000	3,000

Timing Service - PTP	5,000	5,000
Timing Service - NTP + PTP	10,000	7,000
ACCESSORIES		
Copper Ancillaries		
Cat6A Patch Cord 1.5m	200	NA
Cat6A Patch Cord 3m	250	NA
Cat6A Patch Cord 5m	300	NA
Cat6A 24 port Angled Modular Blank Patch Panel	1,220	NA
Cat6A 48 port Angled Modular Blank Patch Panel	2,210	NA
Module Panel Blank	1,220	NA
Copper Cable Management Strip (CMS)	830	NA
Fibre Ancillaries		
OM4 LC patch cord 1.5m	310	NA
OM4 LC patch cord 3m	330	NA
OM4 LC patch cord 5m	380	NA
OM4 LC patch cord 8m	420	NA
OM4 LC patch cord 10m	480	NA
Module Panel Blank (4 Panels)	40	NA
Cabling Work (material + labor)		
OM4 MM Fiber Patch Cord (2 core), LC-LC without panel	4,000	NA
OS2 SM Fiber Patch Cord (2 core), LC-LC without panel	5,000	NA

12 core OM4 MM indoor cable,LSZH,IEC60332-3 without panel	20,640	NA
24 core OM4 MM indoor cable,LSZH,IEC60332-3 without panel	40,630	NA
48 core OM4 MM indoor cable,LSZH,IEC60332-3 without panel	79,840	NA
96 core OM4 MM indoor cable,LSZH,IEC60332-3 without panel	158,280	NA
6 core OS2 SM indoor cable,LSZH,IEC60332-3 without panel	13,960	NA
1 x Cat.6A UTP Cable within Hall A, without Patch Panel	5,350	NA
24 x Cat.6A UTP Cable within Hall A, without Patch Panel	38,600	NA
48 x Cat.6A UTP Cable within Hall A, without Patch Panel	76,410	NA
96 x Cat.6A UTP Cable within Hall A, without Patch Panel	150,510	NA
Power Work (material + labour)		
To supply and install the one 32A single phase IP44 commando socket with current monitoring	11,500	NA
To supply and install the one 32A three phase IP44 commando socket with current monitoring	32,000	NA
To supply and install the one 32A single phase IP44 commando socket with current monitoring and 12 ways BS1363 UK socket power strip	14,300	NA
To supply and install the one 32A single phase IP44 commando socket with current monitoring and 8 ways BS1363 UK socket power strip	13,600	NA

Payment/Billing

- 1) Service Fees for Subscribed Services under an Order shall be payable in advance of the delivery of the Subscribed Services, as follows:
 - a. the Monthly Recurrent Fees for the first Quarter shall become payable upon the Service Commencement Date, provided that where the Service Commencement Date is on a day other than the first day of the Quarter, the Monthly Recurrent Fees for the first Quarter will be pro-rated and calculated in accordance with the actual number of days in that Quarter for which the Subscribed Services will be provided;
 - b. the Monthly Recurrent Fees for each Quarter thereafter shall become payable in advance by the Subscriber on the first day of the Quarter for which the Subscribed Services related to that Monthly Recurrent Fee will be provided;
 - c. the Monthly Recurrent Fees shall be paid by the Subscriber within 30 days from the date of the invoice;
 - d. the One Time Fees for each of the Subscribed Services shall be invoiced by HKEx Hosting to the Subscriber on the applicable Service Commencement Date for each of the Subscribed Services;
 - e. the One Time Fees shall be payable by the Subscriber within 30 days of the date of the invoice;
 - f. the Remote Hands Service Fee for Subscribed Services will be determined using the applicable hourly rate(s) set out in the Fee Schedule. A minimum charge of one half hour will apply to each use of the Remote Hands Service by the Subscriber and each part hour of the Remote Hands Service provided will be charged as a half hour (if 30 minutes or less) or a full hour (if 30 minutes or more);
 - g. the total Remote Hands Service Fee shall be paid in advance by the Subscriber and HKEx Hosting will hold the Remote Hands Service Fee paid by the Subscriber on deposit as an advance payment against the Subscriber's requests for Remote Hands Services up to the level covered by the Remote Hands Service Fee paid;
 - h. amounts deposited by the Subscriber into its Remote Hands Service Fee account shall be non-refundable on the expiry or termination of this Agreement.
- 2) Charges for Accessories are subject to adjustments with reference to the applicable prevailing market rates as reasonably determined by HKEx Hosting.

Subscribers shall contact HKEx Hosting for the most updated charges before placing Orders for Accessories. Charges for Accessories under an Order shall become payable upon delivery of the Accessories to the Subscriber and the Subscriber shall pay such charges within 30 days after the date of invoice.

Accessories will be sold by HKEx Hosting on an “as is” basis. To the maximum extent permitted by Applicable Law, HKEx Hosting does not make or give any warranty or representation of any kind regarding the Accessories and HKEx Hosting excludes any guarantee, condition or warranty (including, without limitation, any guarantee, condition or warranty of merchantability, acceptable quality, fitness for purpose or fitness for disclosed result), or any other right or remedy under, or implied by, any Applicable Law. To the extent that HKEx Hosting’s liability cannot be lawfully excluded, HKEx Hosting’s liability shall be limited to the charges paid by the Subscriber for the Accessories to which the Subscriber’s claim relates and this shall constitute the entire discharge of HKEx Hosting’s liability in relation to the Accessories under any Applicable Law.

Deposit

- 1) The Subscriber shall provide HKEx Hosting with a security Deposit for the amount of 3 month’s Monthly Recurrent Fees of all Subscribed Services immediately upon HKEx Hosting’s acceptance of an Order.

6 Enrolment procedures

Subscribers who are interested in using HKEx Hosting Services should follow the steps listed below:



HKEx Hosting will accept Expression of Interest submission in April and May 2012. Subscribers are invited to apply for the HKEx Hosting Services by returning the HKEx Hosting Services Expression of Interest Form before 31 May 2012. If subscribers would like to have more in-depth understanding of the services, please email to hostingservices@hkex.com.hk. HKEx Hosting Services team will follow up at the soonest.

Applications received after 31 May 2012 will be put in the waiting list and will only be proceeded after the first batch of application are processed and while rack space is still available.

If the demand of aggregated order exceeds the available racks, rack allotment process will kick in. HKEx Hosting will target to allocate at least 1 rack for each EP initially and the remaining available racks will be allocated by lucky draw. HKEx Hosting Services will adopt a fair policy to allocate available racks to EPs.

Hosting Services Subscriber Agreement and Order form will be proceeded from June to August 2012. Upon submitting the signed Hosting Services Subscriber Agreement and Order form, subscriber is required to provide a copy of Business Registration, description of related companies of the subscriber, and the deposit which is equivalent to 3 months of monthly recurrent fee of subscribed services.

Prior to the first service commencement date, subscriber shall provide HKEx Hosting with certificate of insurance evidencing the minimum levels of insurance as set forth in Hosting Service Subscribers Agreement.

For any contractual enquiry, please contact HKEx Hosting Business Development team by sending email to hostingservices@hkex.com.hk or refer to the Hosting Services Subscriber Agreement.

Annex [1]: Key features, differences, and specifications of the hosting Open Gateway (OG) for HKEx Hosting Services

i. Highlights

HKEx will provide the Minimum Hardware Requirement and 3rd Party Software Package Specification for hosting OG; and appoint certified service vendors to take up the software installation task.

Two certified service vendors will be appointed and announced tentatively by early June 2012 once they have completed the certification process.

EPs have to procure the server hardware that meets the Minimum Hardware Requirement, and procure the 3rd Party Software Package, and select a HKEx appointed service vendor for the software installation.

Similar to the existing OG server configuration, the hosting OG will support standard OG configuration and high availability (cluster) configuration. The detailed hardware component requirement is documented in the Minimum Hardware Requirement in paragraph (vii) below.

EPs have to be responsible for their OG hardware and 3rd party software maintenance support arrangement with their hardware and software suppliers. Also, EPs are responsible for direct liaison with their hardware and software suppliers for hardware repair and various types of hardware and software maintenance service activities.

ii. Software Platform (Windows Operating System)

OG is a Windows-based device. The target Windows platform for hosting OG will be Windows 2008 R2.

HKEx will provide the detailed Windows security policy setup procedure and the OG application installation procedure to the appointed service vendors, who are required to pass the hosting OG installation certification test. Also, HKEx will provide a commissioning procedure to the service vendors to ensure the hosting OG is installed and configured properly.

The Windows 2008 R2 software package and other 3rd party software products required for hosting OG is documented in the Third Party Software Package Specification in paragraph (ix) below.

EPs are required to arrange for the procurement of these software packages for their hosting OGs.

Similar to the arrangement for the existing OGs, HKEx will have to own the administrative right of the hosting OG so as to retain the control and remote management of the hosting OG devices to ensure their high availability.

iii. Security Control for Hosting OG

Hosting OG will be installed in HKEx Hosting Services secured data centre such that physical security is guaranteed. Therefore, there would be no need for Smartcard sign-on, and only trading system sign-on will be used for authentication for the hosting OG.

Nevertheless, sensitive data will still be protected by software encryption throughout the data transmission as well as message authentication will still be achieved by checksum calculation.

iv. Hosting OG Application Interface to BSS

There is no change to OG-to-BSS Open Message Interface. Changes at hosting OG are transparent to BSS. However, for performance reason, EPs should consider receiving stock price update in binary format instead of Open Message format if their BSS acquire stock price update information from hosting OG. Alternatively, EP may choose to use the MDS data feed as the source of market data.

v. Order Routing System Connectivity

Order Routing System (ORS) connectivity will not be supported by hosting OG.

vi. Central Trade Feed Service

Central Trade Feed (CTF) is not recommended on hosting OG. CTF is an optional service provided in AMS/3.8. An Exchange Participant firm, subscribing this service, can designate one or more OGs as the consolidation point(s) to receive online trade notifications for trades originated from all trading devices belonging to the firm. For firms with large number of trading devices and throttle entitlement, CTF trade notification messages may introduce substantial traffic during the peak hour and hence additional processing overhead at BSS, which may have impact to order response time. EPs should consider designating OGs other than hosting OGs for receiving CTF.

vii. **Minimum Hardware Requirements**

Standard Hosting OG Configuration

The PC server must be certified for Microsoft Windows 2008 R2 Standard Edition with the following component requirements:-

- CPU: One Intel ® Xeon E5506 CPU or more powerful model (Quad-core CPU with at least 2.13 GHz clock speed and 4 MB cache). AMD CPUs with the same or better performance figure than the minimum CPU requirement may also be considered.
- Memory: 4 GB DDR3 RAM.
- System Storage: 2x 300GB 10K rpm hard-disk configured in RAID-1 (mirror). Hardware RAID controller is expected.
- Removable media: CD Writer or DVD Writer drive.
- Network interface: Two Gigabit Ethernet adapters.
- Power Supply: Dual power supply units.
- Monitor display: Standard PC monitor.
- Keyboard: Standard 101 keyboard.
- Mouse: Standard PC mouse.

High Availability Hosting OG Configuration

Two identical PC servers and one shared disk storage are configured as 2-node cluster. The PC servers and the shared storage must be certified for Microsoft

Windows 2008 R2 Enterprise Edition with the following component requirements:-

PC Server

- CPU: One Intel® Xeon E5506 or more powerful CPU (Quad-core CPU with at least 2.13 GHz clock speed and 4 MB cache). AMD CPUs with the same or better performance figure than the minimum CPU requirement may also be considered.
- Memory: 4 GB DDR3 RAM.
- System Storage: 2x 300GB 10K rpm hard-disk configured in RAID-1 (mirror). Hardware RAID controller is expected.
- Host Bus Adapters (HBA): Dual HBA (e.g. with Serial Attached SCSI (SAS) or Fibre Channel interface) to match with the shared storage.
- Removable media: CD Writer or DVD Writer drive.
- Network interface: Three Gigabit Ethernet adapters.
- Power Supply: Dual power supply units.
- Monitor display: Standard PC monitor.
- Keyboard: Standard 101 keyboard.
- Mouse: Standard PC mouse.

(A single set of monitor display, keyboard and mouse can be shared by the 2 cluster nodes using KVM switch).

Shared (Cluster) Storage

- 2x 300GB 10K rpm hard disk shared storage, configured in RAID-1, with dual controllers (e.g. Serial Attached SCSI or Fibre Channel interface).
- Power Supply: Dual power supply units.

viii. Hosting OG Network Router/Switch

For OG server's upstream connection to the Hosting Switch, a network switch is required. For HA OG configuration or for multiple OG servers sharing the same LAN connection to Broker Supplied System (BSS), a network switch is also

required. It is acceptable to use a single network switch for OG upstream and downstream connection.

At a minimum the EP must provide a router or Layer-3 switch to terminate the 100Mbps/1Gbps/10Gbps multi-mode cross-connect. Various port speeds are available for subscription as described in previous Technical Specification of the HSN.

ix. Third Party Software Package

Standard Hosting OG Configuration

- One copy of Microsoft Windows 2008 R2 Standard Edition.
- One copy of Microsoft Windows Server 2008 Client Access License (CAL).
- One copy of Trend Micro Office Scan V10 anti-virus client software.

High Availability Hosting OG Configuration

- Two copies of Microsoft Windows Server 2008 R2 Enterprise Edition, one for each cluster node.
- One copy of Microsoft Windows Server 2008 Client Access License (CAL).
- Two copies of Trend Micro Office Scan V10 anti-virus client software, one for each cluster node.

Disclaimer

<p>HKEx and/or its subsidiaries endeavour to ensure the accuracy and reliability of the information provided, but do not guarantee its accuracy and reliability and accept no liability (whether in tort or contract or otherwise) for any loss or damage arising from any inaccuracy or omission or from any decision, action or non-action based on or in reliance upon information contained in this information sheet.</p>
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