Resilience Enhancement on Orion Market Data Platform for Derivatives Market (OMD-D)

HKEX-IS

April 2021

Agenda

01 Purpose and Enhancement Highlights

02 High Level Changes of the Enhancement

- Enhancement in Real-time Data
- Enhancement in Retransmission Service (RTS)
- Other Enhancement – OMD Index

03 Implementation Timeline

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Purpose of the Resilience Enhancement on OMD-D

Following the resilience enhancement of OMD-C, OMD-D will also be strengthened by including nodes in the secondary site as stand-by nodes for automatic failover, to foster OMD-D service availability in case a servicing node in the primary site fails.

Enhancements Highlight

Real-time Data

- Enable automatic failover to hot-standby node in secondary site in case service node in primary site cannot function properly

Retransmission Services (RTS)

- Change from active-standby to active-active between primary and secondary site setup; meaning increasing to four active nodes in service[1]

1. Clients should only connect to one RTS node

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Enhancement in Derivatives Standard (DS) and Derivatives Lite (D-Lite) – 1 of 2

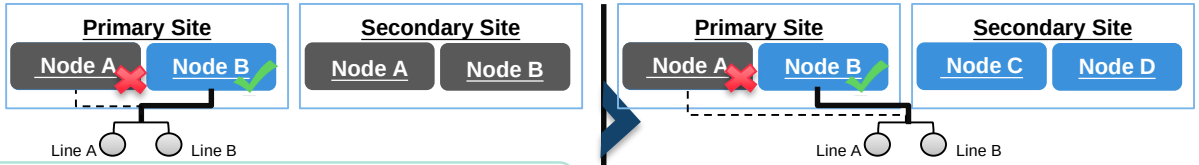
OMD-D
Derivatives Standard (DS) and Derivatives Lite (D-Lite)

For channels:
All channels (including Index Data Channel[1]) except the following:
- Reference Data Channel (message 303 and 305)
- Trade Channel (message 350 and 356)[2]

Current Resilience Model

Enhanced Resilience Model

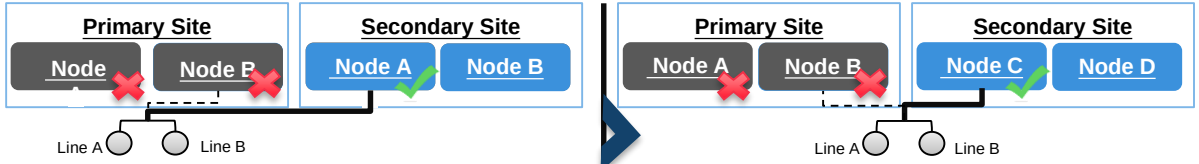
Scenario 1: Hardware failure happens at the active node (node A)



- Automatically take up by the Hot-standby node
- A **short interruption** on the affected channels when switching to the standby node

Same arrangement

Scenario 2: Continue from scenario 1, hardware failure also happens at remaining node (node B) in the Primary site



- Clients would be alerted for OMD Site Failover
- At least 30 minutes interruption for ready to connect to Secondary site

- Node C **automatically** provide service, clients would only experience a short interruption

Advancement:

☑ Stronger resilience support as nodes in Secondary Site could disseminate data instantly

☑ Reduce the interruption time as OMD Site Failover procedure is not triggered[3]

1. For Subscribers of Complimentary Datafeed – Index Feed (IDX)
2. For Subscribers of Complimentary Datafeed – Derivatives Trade (DT)
3. Site Failover will only be triggered at site issue
   (For more details about, please refer to FAQ, Developer's Guide or Interface Specification on OMD-D web corner)

Abbreviation:

Node N	Active node / Hot-standby node
Node N	Failure node

Enhancement in Derivatives Standard (DS) and Derivatives Lite (D-Lite) – 2 of 2

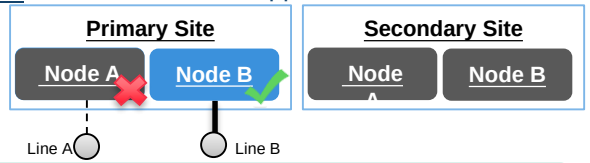
OMD-D
Derivatives Standard (DS) and Derivatives Lite (D-Lite)

For channels:
- Reference Data Channel (message 303 and 305)
- Trade Channel (message 350 and 356)[1]

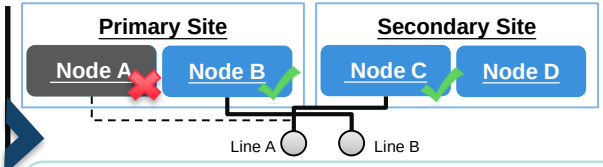
Current Resilience Model

Enhanced Resilience Model

Scenario 1: Hardware failure happens at one of the active nodes (node A)

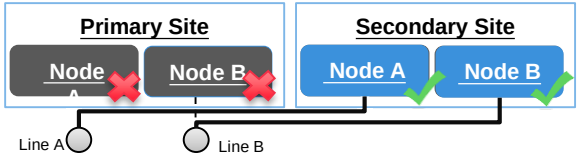


- Data provisioning will be on **single line only**



- The failure node will be taken up by a standby node in the secondary site after a slight interruption
- Messages received from secondary site is expected to be later than the messages from primary site[2]

Scenario 2: Continue from scenario 1, hardware failure also happens at remaining node (node B) in the Primary site



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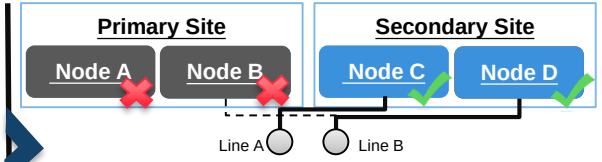


- Nodes in secondary site **automatically** pick up the servicing

Advancement:

☑ Remain dual lines data provisioning

☑ At any point in time, data is disseminated through either line A or line B, or both. No data dissemination interruption as a whole.

Abbreviation:

Node N	Active node / Hot-standby node
Node N	Failure node

1. For Subscribers of Complimentary Datafeed – Derivatives Trade (DT)
2. Around 1 – 2 ms difference is expected

Enhancement in Derivatives Premium (DP) & Derivatives FullTick (DF) – 1 of 2

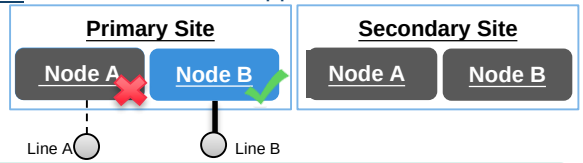
OMD-D
Derivatives Premium (DP) and Derivatives FullTick (DF)

For channels:
- Reference Data Channel (message 303 and 305)
- Level 2 Price, COP and Trade Channel[1]
- Order, COP and Trade Channel[2]

Current Resilience Model

Enhanced Resilience Model

Scenario 1: Hardware failure happens at one of the active nodes (node A)



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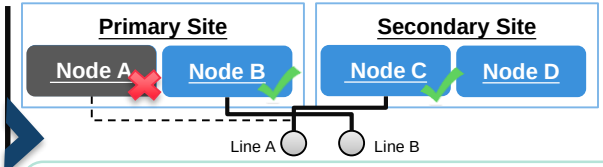

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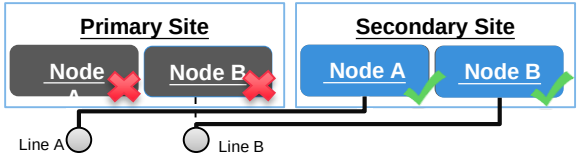

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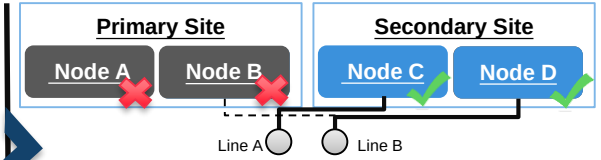

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1. For Subscribers of DP
2. For Subscribers of DF
3. Around 1 – 2 ms difference is expected

Abbreviation:

Node N	Active node / Hot-standby node
Node N	Failure node

Enhancement in Derivatives Premium (DP) & Derivatives FullTick (DF) – 2 of 2

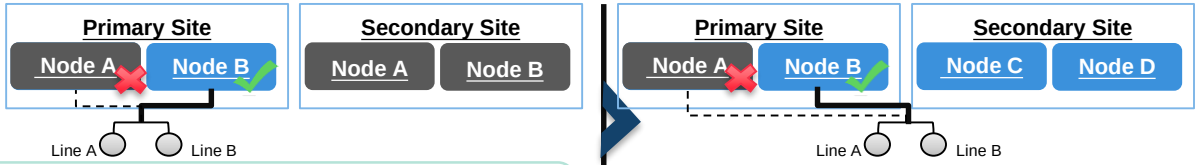
OMD-D
Derivatives Premium (DP) and Derivatives FullTick (DF)

For channels:
- Reference Data Channel (message 301, 302 and 304)
- Status Channel
- Quote Request Channel
- Open Interest Channel[1]
- Series Statistic Channel[1]
- Implied Volatility Channel
- Trade Adjustment Channel
- Market Alert Channel
- Index Data Channel[2]

Current Resilience Model

Enhanced Resilience Model

Scenario 1: Hardware failure happens at the active node (node A)



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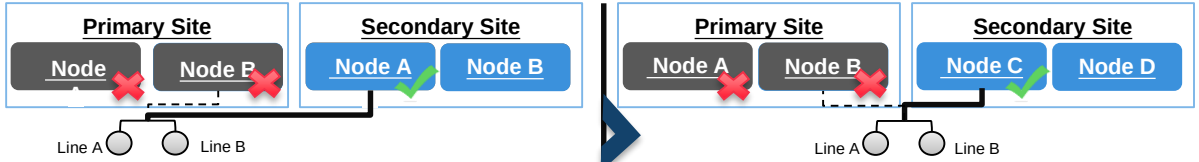

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Enhancement in Retransmission Service (RTS)

OMD-D
Retransmission Service (RTS)

Current Resilience Model

- RTS is supporting by **two nodes** in an Active-Active setup either in primary or secondary site[1]
- Retransmission Service (RTS) will be suspended if both RTS nodes fail (i.e. Double nodes failure); service will be resumed only if the RTS servers in the Secondary site are being activated

Enhanced Resilience Model

- RTS is supporting by **four nodes** all in Active mode across Primary and Secondary sites (i.e. two nodes respectively on each site)[1]
- Retransmission Service (RTS) will NOT be impacted at a same-site double nodes failure scenario

Advancement:

- ☑ Clients can connect to any one of the four RTS nodes at any time
- ☑ No Service Impact in the same-site double nodes failure scenario
- ☑ Clients may develop a round-robin logon mechanism by hunting the rest of RTS servers in case of any failure on one RTS service node

1. Clients should only connect to one RTS node

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Other Enhancement – OMD Index (IDX)

- The resilience enhancement for OMD Index Feed is incorporated in OMD-C Resilience Enhancement, which is scheduled to be launch on 12 April 2021. For more details, please refer to the documents in OMD-C corner.

- There are two changes:
  1) The RTS servers for OMD Index datafeed will be increased from two to four after the launch of OMD-C Resilience Enhancement scheduled for 12 April 2021; and
  2) If there are missing ticks in OMD Index solely due to OMD-C (not because of the feed from the Index compiler), HKEX will send a Missing Index Report with all of the missing ticks by email at the end of the business day. The report format can be found in Section 6 in OMD-C Interface Specification.

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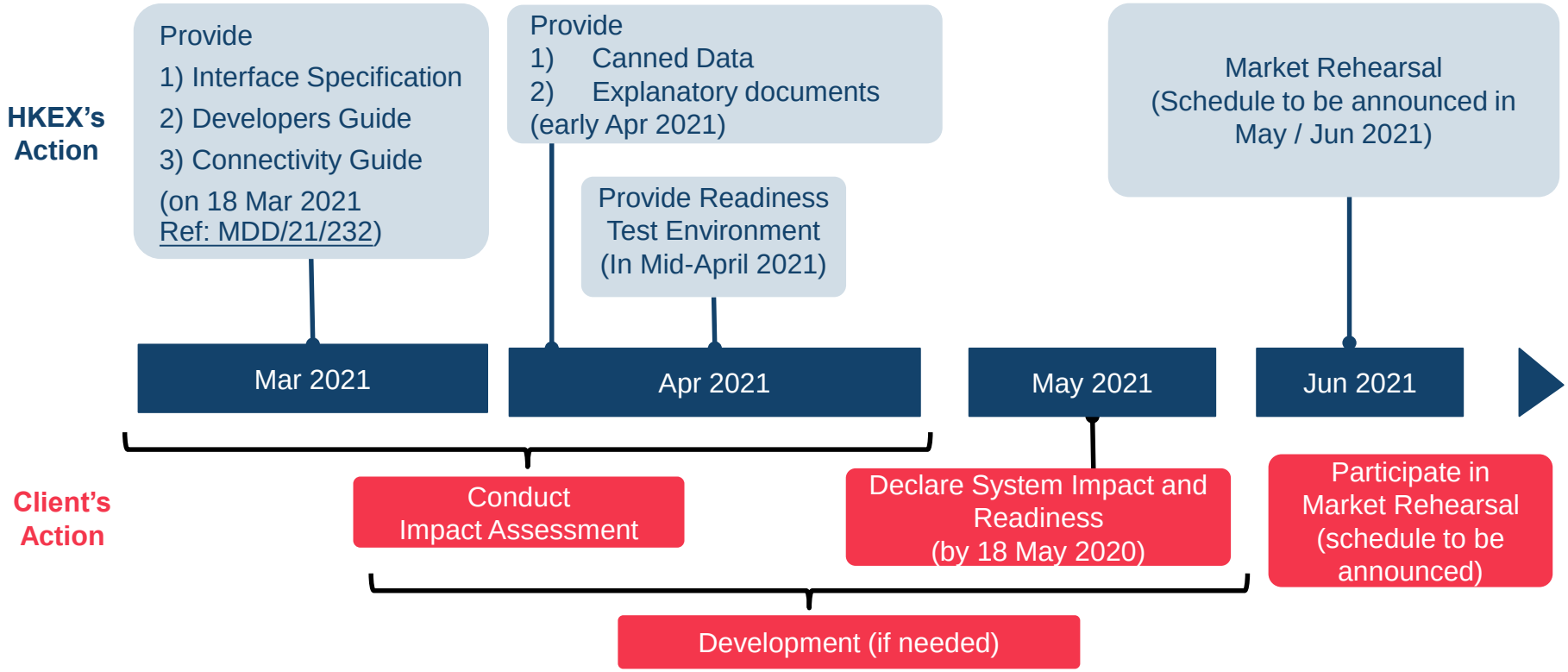

OMD-D Corner: www.hkex.com.hk/OMDD

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