

Futures Industry Association

Business Continuity Disaster Recovery Test Briefings

August 8, 2018



Moderated by
Steve Proctor, FIA

AGENDA

- I. Testing Goals and Objectives
- II. Review of Testing Protocol
- III. Business Continuance Testing
- IV. Participating Markets
- V. Open Discussion – Test Preparations
- VI. Remaining Timeline and Key Dates

INTRODUCTION

Camara Central de Riesgo Contraparte (CRCC) Oscar Mauricio Modera Rojas	LCH ClearNet: Gino DiCarlo
Cboe Futures Exchange (CFE): Cole Chmielewski, Albert Jimenez	Minneapolis Grain Exchange: Ben Lundgren
CME Group: Don Moore	Montreal Exchange / CDCC: Eyal Benezra
Eris Exchange: Chris White, Nick Perak	OCC: Karen Glad, John Kobos
Eurex: Wolfgang Deiseroth	OneChicago: Helen Kitching, Kevin Jay
ICE Exchanges / ICE Clear US / ICE Clear Credit / ICE Clear EU / ICE Clear SG Erik Iodice, Marc MacQuarrie, Jocelyn Ward, Andrey Kalita, Cheung Kwok	Traiana: Moran Yellin
ICE Trade Vault/eConfirm: Dennis Sparrow	trueEX: Diane Sweeney, Kyle O'Donnell

I. TESTING GOALS AND OBJECTIVES

- Test Date: Saturday, October 13th 2018
- Test the ability to conduct critical business functions (order entry through clearing) from alternate/back-up facilities simultaneously (i.e., business continuance)
- Test disaster recovery capabilities among futures commission merchants, back-office service providers, recovery services providers and trading system vendors
- Test the connectivity between exchanges, clearinghouses and their constituents' back-up facilities (“back-up to back-up”), and confirm member firms' ability to send/receive information to/from their back-up facilities/interfaces

TESTING GOALS AND OBJECTIVES ... Continued

- Test end-to-end processing by exchanges through to, and including clearing houses; process actual test trades and produce test end of day reports with the test data.
- Enter a small but meaningful sampling of orders and trades, which will be carried out by a limited number of essential personnel from recovery sites or alternate work locations
- Confirm the receipt/transmission of information to/from clearing members
- Transmit key clearing reports and information to clearing firms to verify “round-trip” communications.

II. REVIEW OF TESTING PROTOCOL

- Exchanges will specify products available for order entry/trading
- All exchanges will use their electronic trading venues for the test and will process test data through to end-of-day reports for clearing members. Testing will take place between 9:00 AM and 3:00 PM EDT, unless otherwise specified.
- The FIA will coordinate the test via an open conference bridge
- Member firms will confirm connectivity with their respective exchanges/clearinghouses:
 - Pre-test connectivity testing will be offered, as applicable
- Unless noted, firms will execute a pre-defined script of orders, and firms will use test accounts.

REVIEW OF TESTING PROTOCOL (Cont'd)...

- Exchanges will generate fill reports on the orders
- All firms will report results and confirm post-test production connectivity to their respective exchanges
- Test plans will be distributed by the exchanges and will also be available on the FIA DR Test web portal at:
<https://bcp.fia.org/events/2018-fia-disaster-recovery-test>

III. BUSINESS CONTINUITY TESTING

- All participants are encouraged to use the test date to exercise their business continuity capabilities
- Firms, vendors, exchanges, clearing houses and swap execution facilities should manage the test, enter orders and have staff work from their alternate work sites
- Business continuity plans should be reviewed; those personnel that would be required to either report to an alternate work site – or work remotely from home - should do so.
- As part of the registration process, firms will be asked if they plan to have staff work remotely and from what city locations.

**IV. PARTICIPATING
EXCHANGES, CLEARING
HOUSES,
SWAP EXECUTION FACILITIES
AND
CREDIT HUBS**

CAMARA DE RIESGO CENTRAL DE CONTRAPARTE (CRCC)

- On October 13th CRCC will fail-over the Colombia XV production data center to the Ortezal back up data center following manuals and procedures.
- Test participants will include Bolsa de Valores de Colombia (BVC), local broker firms and the Colombia Central Bank
- BVC and the firm communications will be re-directed to the back up data center
- On October 16th, all the production systems will be open in the backup datacenter.
- Scripts are not required because all the affiliates are going to participate and the operations will be real.
- Testing will take place between Tuesday October 16th to Friday October 19th.

CBOE FUTURES EXCHANGE (CFE)

- Will use secondary site at 400SL in Chicago. Firms must target secondary IPs to access ports in 400SL.
- The session will open at 7:30 AM CT.
- Participants are encouraged to enter orders and trade with other participants.
 - Firms are also encouraged to test Web-based applications such as Risk Management and Block/ECRP trade entry.
- Order entry systems will reflect October 13th trade date.
- Test Script is available on the [CFE website](#).

CBOE FUTURES EXCHANGE (Cont'd)...

- Secondary site ports in Chicago are available for telnet testing at any time. Session level connectivity testing available on Saturday, September 15 as well as Saturday, October 6.
- Contact Cboe NOC with any connectivity related questions: 913-815-7005.
- Albert Jimenez and Cole Chmielewski contact info:
 - 913.815.7069, ajimenez@cboe.com
 - 913.815.7253, cchmielewski@cboe.com

CME GROUP

Test Scope:

- The primary Chicago data center houses all CME Group production applications, CME Globex, and Clearing as well as Co-location services. The out-of-region data center houses Disaster Recovery (DR) services and will be accessible according to the failure scenarios highlighted in the following 2 scenarios. **Please note that the CME Group utilizes a Single IP for firms connectivity to MQ and a Single DNS name (sftpng.cmegroup.com) for firms connectivity to sFTP for production and DR environments.**
- This 2 scenario approach highlights the potential scenarios that could impact customer connectivity during a disaster in Chicago. In both scenarios Clearing and Globex will be available via the disaster recovery facility.

CME GROUP (Cont'd)...

Scenario 1: In Region: Chicago Metropolitan Disaster:

The primary CME Group data center and redundant access node have been forced to cease operations. All applications will begin functioning in the CME Group out-of-region data center and all Chicago-based connectivity solutions, including GLink and LNET, are inoperable. Customer connectivity that is not dependent on Chicago data centers will be maintained; there will be no changes required by these customers.

Note: GLink and LNET are out of scope in this first scenario, firms that are dependent on Chicago data centers submitting test trades during this window would need to utilize their back-up order routing facilities. This scenario will run for approximately the first 2 hours of the test window (9am to 11 am EDT)

CME GROUP (Cont'd)...

Scenario 2: In Region: Primary Data Center Production Room Failure, Co-location Services Available

During this scenario only the applications and production environments are disabled in the primary data center. All applications will continue functioning in the CME Group out-of-region data center. This scenario also assumes that all carrier and network facilities at the CME Group redundant access node as well as CME Group Co-Location facilities are not impacted by the failure. All methods of customer connectivity will be maintained, **GLink and LNET have been recovered**, and there will be no changes required by the customer. Customers will continue to connect to CME Globex and Clearing applications via production IP addresses.

Note: Glink/LNET have been recovered. Customers will continue to connect to CME Globex and Clearing applications via production IP addresses. LNET has been restored, firms utilizing LNET can test MQ connectivity for the duration of the test. This scenario is scheduled to run for the duration of the test window (11am to 3pm EDT).

- Single IP address/Production IP address for MQ
- Single DNS name for firms connectivity to sFTP
- There will not be any Open Outcry testing

CME GROUP (Cont'd)...

Test Preparation:

- Ping testing will be held on Sept 15th & Sept 22nd from 8:00 a.m. to 1:00 p.m. EDT.
- Firms must register via the FIA website.
- Contact CME Clearing Support (CCS) team at (312) 207-2525 with any questions on MQ IP addresses (same as Prod IP's) or DNS name for sFTP connectivity
- General questions may be directed to the Business Continuity Team - BCM@cmegroup.com.

CME GROUP (Cont'd)...

Support During the Exercise:

- Members should contact their designated CME customer representative (will be assigned), or Clearing Support Team (312) 207-2525 to report any issues.
- Members should contact the GLOBEX Control Center at the GCC Hotline numbers which are: U.S. at +1 800 438 8616, in Europe at +44 800 898 013 or in Asia at +65 6532 5010 to report any trading problems encountered throughout the test

CME GROUP (Cont'd)...

Test Execution - Globex:

a) Verify firm connectivity:

- Clearing DR test window scheduled to begin at 9:00 AM EDT
- Any trades done prior to the start of the test will not be captured.
- October 12th is the valid order entry date
- All fills will be sent back to the Firms with the trade date of October 12th.
- Firms can send a test order in any market

b) Order entry via test script as follows:

- Enter a total of 10 trades.
- Firms should send orders in on 'Floor Only Contracts, like the SPZ8/H9 that will be listed on GLOBEX for the test.

– Firms may receive crossed trades and/or trades with other counterparties.

CME GROUP (Cont'd)...

Test Execution - Clearing:

Clearing – 9:00 AM EDT

- a) Trade reporting to firms' back office systems:
 - *Firms will* verify receipt and delete them.
- b) Connect to CME's sFTP server, using the Production DNS Name:
 - 1) Using Friday's data, FTP the PCS and Large Trader reports.
 - *CME staff* will verify receipt and delete them.
 - 2) CME will transmit Thursday's Trade Register and SPAN files.
 - *Firms will* verify receipt of these files and delete them.
 - 3) If applicable, enter a block trade for 5000 EDH9 @9720.0.
 - *CME staff* will verify receipt of the block trades and delete them.

CME GROUP (Cont'd)...

At the Conclusion of the Exercise:

- Delete any testing files.
- Fail back to your Production environment.
- **Upon test completion firms should contact the GCC at the GCC Hotline numbers which are: U.S. at +1 800 438 8616, in Europe at +44 800 898 013 or in Asia at +65 6532 5010 acknowledging test completion, and then complete/submit the test questionnaire posted on the FIA website to recap the test results. No firm names will be used on the recap report.**

ERIS EXCHANGE

Test Scope:

- Outage Scenario reflects loss of primary matching engine and primary post trade processing system.
- If you're already connecting to CME Group for DR testing, you should see test executions in existing queues.

Test Preparation:

- Firms are encouraged to verify their connectivity to Eris DR systems prior to the formal 2018 FIA Test. Contact the Eris Control Center for particulars and scheduling coordination.
- Firms must register via the FIA website.
- Contact Eris Control Center to receive backup systems connectivity information, 888-587-2699, select 1, or: ECCOps@erisfutures.com
- Technical questions may be directed to: evan.loftus@erisfutures.com

Support During the Exercise:

- A testing script will be provided by Eris Exchange.
- Members should contact the Eris Control Center during the exercise for any trade related issues, 888-587-2699, select 1.

Eurex

Scenario/Implications

- Primary data center becomes inaccessible (including T7 production matching engine, gateways located in the primary datacenter and customer co-location site).
- In that scenario the simulation back-end (located in a different data center) will be used to serve as the DR production back-end.
- T7 interfaces located in the primary data center will switch to the simulation infrastructure and will need to be accessed via simulation network addresses.
- Other T7 interfaces distributed across both data centers can be accessed as usual.

Eurex

Test Scope

- Production reference data will be used, including User IDs, T7 GUI SSH keys and ETI sessions.
- Changes done to these reference data will **NOT** be copied back to production after the test. It is not advised to perform any changes to this data during the test exercise!
- While order entry, modification and deletion will be possible during the DR test exercise, any order book or trading information created during the DR test exercise will **NOT** be transferred back to production.

Eurex

Available Interfaces

The following T7 interfaces will be available during the DR test exercise:

- Enhanced Transaction Solution (ETI) incl. Partition Specific and Low Frequency Gateways
- T7 GUI
- T7 Market Data Service (MDI)
- T7 Enhanced Market Data Service (EMDI)
- Reference Data Interface (RDI)
- Reference Data File (RDF)
- Common Report Engine (CRE)

Eurex

Test Execution

Customers participating in the DR test exercise can

- receive market data via MDI, EMDI and T7 GUI
- read reference data via RDI
- receive Reference Data File (RDF) - provided by TKAM on request
- enter orders and quotes via ETI and T7 GUI
- access CRE

Eurex

Interfaces out of Scope

The following interfaces will **NOT** be available in the DR test scenario

- Eurex clearing systems and their interfaces (FIXML Clearing Interface)
- FIX Trading Interface
- Extended Market Data Service
- Enhanced Order Book Interface
- Eurex Market Signals

Eurex

Timeline

- Start of DR scenario test 14:00 CET
- End of DR scenario test 16:00 CET
- Start of prod environment re-connect test 17:00 CET
- End of prod environment re-connect test 19:00 CET
(Prod environment remains up unattended for the rest of the weekend)

Primary Contact

- Technical Key Account Manager (via individual VIP number)

Detailed information

- Announcement via Eurex Circular (to be published in Sept.)
- Update T7 Disaster Recovery Concept (to be published in Sept.)

ICE EXCHANGE

The ICE Exchange secondary site in Atlanta will be used for the FIA DR Test on Saturday, October 13th

- The following markets/products will be available for testing:
 - ICE Futures US Sugar 11
 - ICE Futures US Dollar Index
 - ICE Futures US Canola
 - ICE Futures Europe WTI
 - ICE Futures Europe Three Month Euribor
 - ICE Futures Singapore Mini Brent
- Test markets will follow the schedule below (all times in EDT)
 - 0001 PRE-OPEN
 - 0900 OPEN
 - 1200 CLOSE
- Interface availability:
 - All front-end trading interfaces (WebICE, ICE Block, FIX, Pricefeed)
 - All reporting interfaces (Deal Reports, Position Reports, etc.) will be accurate based on test (and live SPOT/OTC/NGX) trading activity
 - Back-office interfaces NOT available (Credit Management, Clearing Admin, etc.)



IMPORTANT NOTE:

All Spot, OTC, and NGX markets will be open and live throughout the testing. NO testing is permitted in these markets. Any trades entered in these markets are valid trades and will be honored as such.

ICE EXCHANGES (Cont'd) ...

- **Registration and user setup**

- Registration for the ICE Exchange is not required
- All existing customers with valid trading IDs are welcome to participate
- Existing production User ID and password will be used for login
- No test/temporary IDs or access will be provisioned for the FIA DR testing

- **Test administration and support:**

- All participants MUST clean up all backend system data after testing
- No futures trades performed during testing hours will be valid
- At the end of the DR testing period, all futures trade data will be deleted from the ICE Exchange and databases and no record of those test transactions will persist
- The ICE Helpdesk (770-738-2101 Option 1) will be available 0800-1300 ET
- No network, DNS, or IP changes will be required to connect to the ICE Exchange secondary site during the ping test or the FIA DR Test



IMPORTANT NOTE:

All Spot, OTC, and NGX markets will be open and live throughout the testing. NO testing is permitted in these markets. Any trades entered in these markets are valid trades and will be honored as such.

ICE EXCHANGES (Cont'd) ...

- **Clearing Information:**

- All ICE Futures US trades will be submitted to the ICE Clear US secondary site
- All ICE Futures Europe trades will be submitted to the ICE Clear Europe secondary site
- All ICE Futures Singapore trades will be submitted to the ICE Clear Singapore secondary site

- **Ping test overview**

- Atlanta DR site will be available for Ping Pre-Test on Saturday, September 15th
- All futures markets will be closed, only ping and system logins will be permitted
- Spot/OTC/NGX markets will be open for production trading – no test trades permitted
- The system will be available for testing between 0900-1200 ET
- The ICE Helpdesk (770-738-2101 Option 1) will be available between 0900-1200 EDT
- No network, DNS, or IP changes will be required to connect to the DR site during the ping test or the FIA DR Test



IMPORTANT NOTE:

All Spot, OTC, and NGX markets will be open and live throughout the testing. NO testing is permitted in these markets. Any trades entered in these markets are valid trades and will be honored as such.

ICE CLEAR - ICUS, ICEU, ICSG

ICE operates several Clearing Houses (CHs) globally, each of which will participate in the annual FIA Industry Disaster Recovery testing. The ICE CHs covered within this section are:

ICE Clear U.S. (ICUS)

ICE Clear Europe (ICEU)

ICE Clear Singapore (ICSG)

- All CMs must register via the FIA registration website
- Trade date will be Saturday, October 13th. Clearing date will be Monday, October 15th.
- Clearing members will use production URLs for the following clearing applications. URLs by CH are listed below.
 - MFT
 - ECS
 - PTMS/ACT
- Trade messaging MQ changes will be completed prior to the start of the test.

ICE CLEARING HOUSES (Cont'd)...

Ping Testing

Clearing members must verify connection to online clearing applications, using production URL's and MQ configurations.

- Ping testing will be conducted on Saturday, September 15th from 9am-12 pm ET. While this is primarily an opportunity to verify changes necessary for trade messaging over MQ, the clearing applications available online will also be switched over.
- For MQ, Clearing members must verify connection by sending an MQ ping through their channel.

ICE CLEARING HOUSES (Cont'd)...

Test Day

- All times Eastern Time (ET).
- Clearing applications will be available at 9:00 am on Saturday, October 13th.
- Beginning at 12:30 pm, ICE will revert all trading and clearing applications, including MQ channels, back to production.
- An advisory will be sent to test participants and announced on the ICE and FIA bridge calls.
- Clearing members are strongly encouraged to confirm their reconnection to production at the conclusion of the testing.

ICE CLEARING HOUSES (Cont'd)...

Test Cases – Test Day

- Clearing members will log in to post trade management systems (PTMS/ACT) to allocate test trades which have passed through to clearing from the WebICE trading system.
 - Clearing Members will confirm receipt of trade messages over MQ.
 - Clearing Members will log in to ECS to verify connectivity. CMs may enter test banking instructions in ECS (instructions will not be passed to SWIFT).
 - Clearing Members will login to MFT to deliver a test GCM or Large Trader file (GCM, or FIFO for ICUS) and retrieve a Matchoff file and Clearing reports.
-
- CM's are required to complete and submit the checklist of results to each clearing house at the completion of the testing.

ICE CLEARING HOUSES (Cont'd)...

- **ICE Clear US**

ECS (<https://ecs.usclearing.theice.com/console/index.html>)

MFT (<https://mft.usclearing.theice.com>)

PTMS (<https://ptms.usclearing.theice.com/client/ptms.jnlp>)

ACT (<https://fec.usclearing.theice.com/>)

- **ICE Clear Europe**

ECS (<https://ecs.euclearing.theice.com/trade/login>)

MFT (<https://mft.euclearing.theice.com>)

PTMS (<https://ptms.euclearing.theice.com/client/>)

ACT (<https://act.euclearing.theice.com/AllocateClaim/login.jsp>)

ICE CLEARING HOUSES (Cont'd)...

- **ICE Clear Singapore**

ECS (<https://ecs.sgclearing.theice.com/trade/login>)

MFT (<https://mft.sgclearing.theice.com>)

PTMS (<https://ptms.sgclearing.theice.com/client/>)

ACT (<https://act.sgclearing.theice.com/AllocateClaim/login.jsp>)

ICE CLEAR CREDIT

ICE Clear Credit will participate in the FIA Disaster Recovery Test on Saturday, October 13th.

- All times are Eastern Time (ET).
- CDS clearing applications will be available at 10:00 am ET.
- Beginning at 12:00 pm ET, ICE will revert all clearing applications back to production.

Ping Testing

Ping testing will be conducted on Saturday, September 15th from 10:00 am ET -12:00 pm ET. The CDS clearing applications available will be switched over. Participants must verify connection to the CDS clearing applications using the URLs given in the following slides.

ICE CLEAR CREDIT

The following CDS clearing applications will be available through the ICE Clear Credit DR site for Clearing Participants to test:

➤ **Managed File Transfer (MFT):**

- File Download
 - *E.g. Clearing Eligible Trade File, Final Clearing Instruction File*
- File Upload
 - *E.g. Clearing Eligible Trade File*

➤ **ECS Banking System**

➤ **Direct Pricing:**

- FIX Pricing API
- PACE UI

➤ **ICE Risk API**

**ICE Clear Credit will be operating from its DR location; therefore all data entered into the DR clearing system will be deleted. CDS Clearing Participants that receive data during the test to their production system should take precautions not to process disaster recovery transactions with production data.*

ICE CLEAR CREDIT

MFT - Retrieve Data Files via SFTP

CDS Clearing Participants can test the SFTP functionality in order to retrieve data files. ICE Clear Credit will make production data files available to CDS Clearing Participants by using the below:

For Individual Account Users Server/Host Name URL:

securemft.icc.theice.com

IP Address: 63.247.112.89

Port: 22

For Service Account Users Server/Host Name URL: mft.icc.theice.com

IP Address: 63.247.112.88

Port: 22

ICE CLEAR CREDIT ECS Banking System

ICE Clear Credit CDS Clearing Participants should make sure they have access to the ECS Banking system. Clearing Participants should login to the below URL to ensure they have access:

Host Name URL: <https://ecs.icc.theice.com/trade/Login>

ICE CLEAR CREDIT

Direct Pricing

ICE Clear Credit CDS Clearing Participants should make sure they have access to the FIX Pricing API and PACE UI. Clearing Participants should login to ensure they are able to establish connectivity to these applications.

FIX Pricing API

Host Name URL: fix.icc.theice.com

IP Address: 63.247.112.95

Port: 10001

PACE UI

<https://pace.theice.com/>

ICE CLEAR CREDIT

At the Start of the Test

Participants are encouraged to contact the ICE Clear Credit CSS staff at (312) 836-6890 prior to the DR test. This will allow the appropriate ICE Clear Credit CSS staff to monitor results and assist participants in the DR test if need be.

At the Completion of the Test

Once a Clearing Participant has determined that all their test objectives have been met, please send an email outlining each item tested along with the results to css@theice.com.

At the completion of the test, Clearing Participants are encouraged to contact CSS at (312) 836-6890 in order to provide ICE Clear Credit with your firm's CDS DR test status.

ICE CLEAR CREDIT

How to Participate

ICE Clear Credit CDS Marketplace Disaster Recovery Test Request Form

To help prepare for a smooth CDS Marketplace disaster recovery test, please complete the following form and provide appropriate contacts. After completion, please return the form by e mail to css@theice.com.

Will your firm be participating in the ICE Clear Credit Disaster Recovery Test?

Yes ___ No ___

SCM ___ FCM ___

Firm Name	
-----------	--

	Contact	Position	Phone	DR Phone
Primary				
Secondary				



ICE CLEAR CREDIT

Contacts:

Should you have any questions, please call or e-mail the Client Services and Support Group:

Client Services and Support

312-836-6890

css@theice.com

ICE TRADE VAULT/eCONFIRM

ICE Trade Vault/eConfirm will participate in the industry wide testing on October 13th 2018. During this testing window (9am – 12pm ET) the following systems will be failed over to our disaster recovery site for testing.

- ICE eConfirm
 - Trade Vault US
 - Trade Vault Canada
 - Trade Vault EMIR
 - Trade Vault Remit
 - MFT (Secure FTP Server)
-
- No changes to URL's are required for testing.
 - www.icetradevault.com
 - mft.tradevault.theice.com
 - There will be NO ping test for ICE Trade Vault/eConfirm.
 - No REMIT data will be sent to ACER during testing



IMPORTANT NOTE:

Any trades entered during the testing window are NOT valid trades and will NOT be ported back to our Production environment.

ICE Trade Vault/eConfirm(Cont'd) ...

- **Registration and user setup**

- Registration for ICE Trade Vault/eConfirm is not required, but recommended.
 - Contact tradevaultsupport@theice.com if you plan to participate.
- All existing customers with valid Trade Vault/eConfirm IDs are welcome to participate
- Existing production User ID and password will be used for login
- No test/temporary IDs or access will be provisioned for the FIA DR testing

- **Test administration and support:**

- At the end of the DR testing period, all data from the testing period will be deleted from ICE Trade Vault and eConfirm and databases and no record of those test transactions will persist.
- No network, DNS, or IP changes will be required to connect to the ICE Trade Vault/eConfirm secondary site
- Starting @ 12:15 ET all systems will be reverted back to production.
- Notifications will be sent when systems are in TEST mode and when systems are back in PRODUCTION mode.
- Support will be available from 0900-1200 ET by contacting the helpdesk line @ 770-738-2101 Option #4



IMPORTANT NOTE:

Any trades entered during the testing window are NOT valid trades and will NOT be ported back to our Production environment.

ICE Trade Vault/eConfirm (Cont'd) ...

- **Test Cases – Recommended:**

- The recommended test cases have been outlined in a separate document. Please contact the sales team (tradevaultsupport@theice.com) if you are planning to participate and they will provide those recommended test cases.



IMPORTANT NOTE:

Any trades entered during the testing window are NOT valid trades and will NOT be ported back to our Production environment.

LCH CLEARNET

Summary

- To enable members to test connectivity to the LCH back up data center, a service has been developed to be able to monitor in real-time the availability of connectivity to the data center. The service that has been implemented will provide feedback to a user or monitoring device. This is independent of any clearing application and is an indicator of connectivity to the LCH data center only.

Connectivity Overview

- Connectivity tests are performed over HTTP. Supported methods are via Web Browser or curl/wget utility.
- The connectivity test returns a web page indicating that connectivity was successful, and in addition the client IP address as seen by LCH.
- This test is available via the Internet and selected 3rd Party networks, utilizing 2 different FQDNs. URL's are provided to verify connectivity to LCH generically, as well as connectivity to a specific data center. All connections should be made by FQDN and not by IP address, as IP addresses are able to change.

LCH CLEARNET

Results Page

- The resulting page from a web browser appears as below. Testing using curl or wget and parsing of the content shall be the responsibility of the client. The actual format of the page may vary and is not guaranteed.



LCH CLEARNET

Connecting to LCH

1) Connecting via the Internet

- Internet tests can target an address that shall be resolved to the current active 'site' or specific sites to test end-2-end connectivity for verification of sites that may not be currently active for any services.

• Target	URL	Description
• LCH Active	http://conn-test.lchclearnet.com/info.html	Verifies connectivity to the LCH default data center
• London	http://conn-test-gbr.lchclearnet.com/info.html	Verifies connectivity to the LCH London 'Data Center'
• PDC DR)	http://conn-test-mdr.lchclearnet.com/info.html	Verifies connectivity to the LCH Paris Data Center (Metro DR)

LCH CLEARNET

2) Connecting via 3rd Party Networks

- Select 3rd Party networks support testing using FQDN's that resolve to an IP address on the advertised 3rd party network addresses.

• Target	URL	Description
• LCH Active center	http://conn-test.lchclearnetservices.com/info.html	Verifies connectivity to the LCH default data center
• London 'Data Center'	http://conn-test-gbr.lchclearnetservices.com/info.html	Verifies connectivity to the LCH London
• PDC Center (Met DR)	http://conn-test-mdr.lchclearnetservices.com/info.html	Verifies connectivity to the LCH Paris Data

3). Test Results

- Once testing has been completed please can you confirm the results of the test to the following email address:
- membertesting@lch.com
- Any issues or questions should also be forwarded to this email address.

LCH CLEARNET (Cont'd) ...

Test Preparation:

- This test can be performed at any time from your Primary or DR site
- Firms must register via the FIA website
- Contact LCH.Clearnet Support at 1-212-513-8265 with any questions or issues
- General questions may be directed to Gino DiCarlo at gino.dicarlo@lch.com or Gillian Randle at Gillian.Randle@lch.com

LCH CLEARNET (Cont'd) ...

Support During the Exercise:

- Members should contact the Support Team +44-20-7426-7200 to report any access issues

Test Execution - SwapClear LTD :

- Verify firm connectivity:
 - DR test window scheduled to begin at 9:00 AM EST
 - Trades should not be entered and data should not be altered during this test

LCH CLEARNET (Cont'd) ...

At the Conclusion of the Exercise:

- Members and the Exchange will fall back to their Primary data center sites
- Members can re-test to LCH.Clearnet's data center with the same test procedure
- Firms can contact Support Team at +44-20-7426-7200 to report any access issues and general questions may be directed to Gino DiCarlo at gino.dicarlo@lch.com

MINNEAPOLIS GRAIN EXCHANGE (MGEX)

- MGEX will be utilizing MGEX DR systems for the FIA DR test on Saturday, October 13th.
- Clearing Members and Firms must register on the FIA website to participate in the MGEX Clearing test.
- Testing will occur from 8AM – Noon CDT on October 13th.
- Trade date can be either October 12th or 13th.
- All MGEX products will be available for testing.
- Trade Entry via CME Globex® and MGEX Trade Entry Matching System (“TEMS”)
- MGEX Open Outcry trades will be entered in the TEMS system.
- Trades entered for MGEX products into the CME GLOBEX platform and MGEX TEMS will be cleared by MGEX Clearing using the MGEX DR Site.

MGEX (Cont'd)...

- After Trade Entry is completed, trade files (TRES files) will be generated by the MGEX DR Clearing Server and placed on the MGEX DR FTP server. The MGEX DR FTP server is accessible via IP with the same logins and passwords as the production system.
- Participants are reminded to fail back to Production systems at the conclusion of the FIA DR test.
- Connectivity and Ping testing will be available prior to the test and can be scheduled on an ad-hoc basis.
- Firms having technical issues with MGEX Clearing on the day of the test may call the MGEX Clearing group at (800) 827-4746 (option 3 then option 1) or (612) 321-7146 for support.
- Please contact MGEX Clearing group for information or support pertaining to the FIA DR Test. Email: clearing@mgex.com

TMX GROUP – MONTREAL EXCHANGE (MX)

MX will offer two connection periods. An early one that will permit connectivity to the primary site, and a second to access our back-up site.

Times and systems availability will be as follows:

Time	Access to Primary or back-up system		Instrument state
7:00 am – 7:55 AM	Primary		Pre-open
7:55 – 11 AM*	No access	7:55 – 9:00 disaster simulation	Market out of service
		9:00 – 11:00 recovery	
11:00 am*- 1:30 pm	Back-up		15 minutes - Pre-Open
			Trading

*System will be up by 11

TMX GROUP – MONTREAL EXCHANGE (MX)

- **No network, DNS, or IP changes will be required to connect to the DR site during the connectivity test or the FIA DR Test**
- **No trades will occur during the Pre-Opening period**
- **MX will provide automated market volume for bid/offer on selected instruments in the back-up environment**
- **Orders must be entered with a October 13th Trade Date (day orders only)**
- **Broadcast of trades transmitted to firms via SOLA Trading protocols and disseminated via the HSVF**
- **No trades performed during testing hours will be valid**
- **All participants MUST clean up all backend system data after testing**

CANADIAN DERIVATIVES CLEARING CORP. (CDCC)

- CDCC will recover to its DR site
 - Clearing Members will verify connectivity and can send/receive messages
 - No network, DNS, or IP changes will be required to connect to the DR site during the connectivity test or the FIA DR Test
 - Clearing Members must register via the FIA website
 - Will test FTP/Reporting capabilities
 - Will test FIXML capabilities
- Markets will be in Pre-Opening state by 11:00 AM EDT
 - No trades will occur during the Pre-Opening period
 - Pre-Opening and Opening Times will need to be confirmed
 - MX will provide automated market volume for bid/offer on selected instruments
- The market will open at 11:15 AM EDT
 - No trades performed during testing hours will be valid
 - All Clearing Members MUST clean up all backend system data after testing
 - Trades will flow from MX to CDCC's environment
 - Trades & Positions will be available for validation via SOLA® Clearing Manager

MX / CDCC (cont'd)

Important Dates

- Connectivity testing will be offered on September 8th 2018 for both MX and CDCC participants/clearing members

Contacts

- Contact Eyal Benezra with any Montreal Exchange business questions:
514-787-6635
eyal.benezra@tmx.com

- Contact Patrizia Ursino with any CDCC business questions:
514-787-6481
patrizia.ursino@tmx.com

OCC

Overview

- OCC's version of the FIA Business Continuity and Disaster Recovery Industry Test will include round trip processing with members and exchanges.
- Similar to last year's test, OCC will simulate a standard business day from market open through positions finalization.
- OCC will support all inbound and outbound communication protocols from our DR environment along with the ENCORE GUI application.
- All data received will be processed and distributed to registered participants according to their registration specifications.

OCC (Cont'd) ...

Test Objectives:

- Test round trip processing with Members and Exchanges including trades, post trades, positions finalization, outbound data distribution and end of day reports
- Test the ability to conduct critical business functions (trades processing through positions finalization) from alternate/back-up/DR facilities simultaneously

OCC (Cont'd) ...

Test Details:

- **Starting Inventory**
 - Product/Contract and Position Inventory for the test will be a snapshot of the production inventory as of “Market Open” Thursday, October 11, 2018
- **Symbols / CUSIP**
 - OCC will support production symbols and CUSIP’s
- **Trade Date**
 - Trade date for the OCC Encore System will be Thursday, October 11, 2018
 - All inbound Exchange Trades will have a trade date of Saturday, October 13, 2018
 - Inbound Member transactions will be accepted with a trade date of Thursday, October 11, 2018 or Saturday, October 13, 2018.
 - Exchange Trades and Member Post Trade data received with a trade date of Saturday, October 13, 2018 will be flipped to Thursday, October 11, 2018 for processing.
 - All outbound data from OCC will have a trade date of Thursday, October 11, 2018.

General Test Information

Description	Details
Test Registration Required	Yes for Non-Mandated Participants OCC RegSCI Registration Website https://www.theocc.com/clearing/certification-testing/reg_sci_dr_industry_test_registration.jsp
Environment Used For Test	DR Environment
Advanced Planning & IT/Connectivity Contacts	Karen Glad (Primary) kglad@theocc.com 312-322-2041 Member Services Help Desk 800-621-6072 occDRtest@theocc.com
Test Day Contacts	Member Services Help Desk 800-621-6072 Option 1 Support will be available for the duration of the test
Availability of Test Day Conference Bridge	No – OCC will distribute broadcast emails throughout the test
Completion of Test Acknowledgement Protocol	Complete Email Template and Send To occDRtest@theocc.com

OCC (Cont'd) ...

General Test Information (Cont'd) ...

Description	Details
Systems Supported	Encore, DDS
Client Connectivity Configurations	IP and Leased Lines (includes NDM, SFTP & MQ)
Production Systems Reset and Test Data Purged	Yes – Prior to Monday opening Firms are responsible for purging test data on their systems
Special Registration Requirements	Advanced Registration Required – No Day Of Registration Accepted
Special Instructions	OCC will require all firms testing on October 13, 2018 to pre-test connectivity on one of the designated test dates in August or September

OCC (Cont'd) ...

Testing Pre-Requisites :

- Participants must register in advance via the OCC website
- Once registered OCC will contact registered participant to provide overview of testing scope and distribute the Industry Test Questionnaire and the 2018 Technical Specification forms which must be filled out and returned to OCC.
- Members can choose to test from Production/Back-up or DR site and must disclose to OCC what site is being used for the test
- Connectivity Testing is required in advance of participation in the Industry Test. OCC will support connectivity testing on the following dates:

Day/Date	Time (ET)	Connectivity Pre-registration	2018 Tech Spec Form
Saturday, Aug 11, 2018	9:00 a.m. – 2:00 p.m.	Required	Required
Saturday, Sept 15, 2018	9:00 a.m. – 2:00 p.m.	Required	Required

OCC (Cont'd) ...

• Test Schedule

Business/ Trade Date	Time (ET)	Activity	Inputs/ Outputs	Description
Saturday 10/13/2018*	8:30 a.m. – 9:15 a.m.	Pre-Market Open Connectivity	N/A	- Resolution of connectivity & start-up issues
	9:30 a.m. – 1:00 p.m.	Mock Trading Cycle	Inputs Outputs	- Real-time Trades (Exchanges) - Real-time FIXML Post Trades (Members) - Batch FIXML Post Trades (Members) - External Encore Post Trades (Members) - Real-time Trade DDS – Pends/Rejects (Exchanges) - Real-time DDS (Members)
	1:00 p.m.	Market Close		
	1:00 p.m. – 2:00 p.m.	Post Trade Cycle	Inputs Outputs	- Trade Balancing (Exchanges) - Backup Batch Trade Files (Exchanges) - Exchange Price File (Exchanges) - Real-time FIXML Post Trades (Members) - Batch FIXML Post Trades (Members) - External Encore Post Trades (Members) - Real-time DDS (Clearing Members)
	2:00 – 6:00 p.m.	Positions Finalization / End of Day	Inputs Outputs	- N/A - ORSA DDS (Exchanges) - Batch DDS (Members) - External Encore Reports (Members) <ul style="list-style-type: none"> • Position Activity • Position Summary

ONECHICAGO

Background

- Test scripts will be published on Friday, June 29th.
- Registration opens Thursday, June 21st and can be completed at the following link: <https://bcp.fia.org/events/2018-fia-disaster-recovery-test>.
- Pre-test connectivity screening is scheduled for Saturday, September 15th.
- If a firm does not pass the connectivity screening on Saturday, September 15th, there will be a second connectivity screening on Saturday, September 29th.
- Before participating with OneChicago in the 2018 FIA Disaster Recovery Test on Saturday, October 13th, firms are required to pass the pre-test connectivity screening.
- Disaster Recovery testing for Risk Control is optional.

ONECHICAGO (Cont'd)...

Support Contacts

- Helen Kitching contact info:
 - 312-883-3427, hkitching@onechicago.com
- Kevin Fay contact info:
 - 312-883-3415, kfay@onechicago.com

Contact OneChicago with any test related questions:

312-883-3411

bcdrtesting@onechicago.com

TRAIANA LIMIT HUB

- Traiana operates Limit Hub globally, which will participate in the 2018 FIA Industry Disaster Recovery testing.
- The primary Limit Hub data center at NY will be forced to cease operations. Limit Hub will be functioning from the secondary data center in Chicago.
- No action is required by Limit Hub participants as they connect to both primary and secondary instances via the same IP addresses.
- The test scenario will take place between 9:00 AM and 12:00 PM EDT
- Limit Hub participants should contact the support team at LHDRTestSupport@Traiana.com to report any issues

TRAIANA LIMIT HUB (Cont'd) ...

- Traiana switchover to DR site Quarterly and run production environment from Chicago site for a week / two weeks (meaning LH fully connected and live from DR site to all participants)
- Possible test scenarios:
 - Switch between Prod and DR sites - Transport Layer
- Pre-test requirement –
 - Participating firms must register via the FIA website and coordinate test scripts with Traiana
- At the conclusion of the testing participating firms will confirm reconnection to production

TRAIANA LIMIT HUB COMMUNITY

FCM	SEF
Bank of America Merrill Lynch	BGC Derivatives Markets
Barclays	Bloomberg SEF
BNP Paribas	Clear Markets North America
Citi	GFI Swaps Exchange
Credit Suisse	ICAP SEF
Deutsche Bank	ICE Swap Trade
Goldman Sacks	Javelin SEF
HSBC	MarketAxess SEF Corporation
JPMorgan Chase	TeraExchange
Morgan Stanley	TradeWeb (TW SEF)
Nomura	Tradition (Trad-X)
SG Americas	trueEX
UBS	Yield Broker
Wells Fargo	

TRAIANA LIMIT HUB (Cont'd) ...

TEST COVERAGE - TRANSPORT

- Will use Limit Hub Secondary Site (Traiana DR at Chicago)
- Pre-test connectivity tests will be offered on an ad-hoc basis. Please contact us to schedule a date/time.
- Contact Traiana Limit Hub Support with any test related questions:
LHDRTestSupport@Traiana.com
- FIX Heartbeat
 - Prod to Traiana DR
 - DR to Traiana DR
- MQ Ping
 - Prod to Traiana DR
 - DR to Traiana DR

trueEX

DCM Platform

- GUI hostname will not change
- FIX IP addresses will change
- Test trades to be executed on the 2Y
- Test orders can be posted/received on the 5Y
- Pre-Open 0830, Open 0900, Close 0100 (EDT)

SEF Platform

- GUI hostname will not change
- FIX IP addresses will change
- trueEX support staff to act as respondent for all trades
- Platform Open 0900, Close 0100 (EDT)

trueEX (Cont'd)...

- Trade date will be October 13th 2018
- Firms must register on the FIA website
- Firms must validate connectivity on September 15th or September 29th
- Test plans are posted on the FIA website
- Contact trueEX Support with any questions: [\(646\) 786-8526](tel:6467868526), support@trueex.com.

V. OPEN DISCUSSION - TEST PREPARATIONS

- Discussion with member firms and exchanges as to their state of preparation and readiness:
 - Back-up systems/communications links
 - Order entry and routing
 - Give up processing
 - Clearance and settlement
 - Use of third party service providers
- Major issues or concerns

EXCHANGE AND CLEARING HOUSE TESTING MATRIX

Exchanges and Clearing Houses	CRCC	CBOE FUTURES	CME GROUP	ERIS EXCHANGE	EUREX EXCHANGE	ICE EXCHANGES ICE CLEAR	LCH CLEARNET
Systems	SMART	CBOE Command	GLOBEX Clearing360 SFTP	Eris SwapBook	T7 Trading Platform	Web ICE ECS PTMS/ACT MFT Files FIX Pricing API PACE UI	SwapClear LTD
Pre-Test/Ping Testing Dates	N/A	9/15	9/15, 9/22	Ad Hoc	N/A	9/15 (all)	9/15
Successful Login from Members DR Site	Y	Y	Y	Y	Y	Y	Y
Trade Date	10/13	10/13	10/12	10/13	10/13	10/13	10/13
Receipt of 10 Orders from Members Via Pre-Defined Scripts	Y	Y	Y	Y	Y	N	N/A
Transmit 10 Fill Reports to Members	Y	Y	Y	Y	Y	N	N/A
Receipt of PCS and Large Trader Reports from Members	N/A	N/A	Y	N/A	N/A	N	N/A
Download Previous Day Clearing Reports: Match Off, Report and SPAN Files	Y	N	Y	Y	N	Y	Y
All Production Systems Restored, Test Data Re-Set	Y	Y	Y	Y	Y	Y	Y

EXCHANGE AND CLEARING HOUSE TESTING MATRIX

Exchanges and Clearing Houses	MGEX	OCC	OCX	TMX/ CDCC	trueEX
Systems	LOBEX TEMS FTP	ENCORE DDS	OCX delta1	SOLA	DCM PTC
Pre-Test/Ping Testing Dates	9/15, 9/29	8/11, 9/15	9/15	9/8	9/15, 9/29
Successful Login from Members DR Site	Y	N	Y	Y	Y
Trade Date	10/12 or 10/13	10/11 or 10/13	10/13	10/13	10/13
Receipt of 10 Orders from Members Via Pre-Defined Scripts	Y	N/A	Y	Y	Y
Transmit 10 Fill Reports to Member Firms	Y	N/A	Y	Y	Y
Receipt of PCS and Large Trader Reports from Members	Y	N/A	N/A	N/A	N/A
Download Previous Day Clearing Reports: Match Off, Report and SPAN Files	Y	N/A	Y	Y	N/A
All Production Systems Restored, Test Data Re-Set	Y	Y	Y	Y	Y

VI. REMAINING TIMELINE AND KEY DATES

9/12/2018	Monthly Committee Call
9/15/2018	Pre-Test Communications Testing
9/22/2018	MQ pint test date (for CME Group only)
9/26/2018	Weekly Committee Call
9/29/2018	Pre-Test Communications Testing
10/3/2018	Weekly Committee Call
10/5/2018	Test Registration Closes
10/12/2018	All-Hands Call - Day Before the Test
10/13/2018	Annual Industry Test Day