

CBOE*Direct* Release Notes

Cboe*Direct* 8.8 and Infra 14.2

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Overview of CD Server changes in this release

Work requests included in this release

- 6814 – Wash Trade Prevention
- 6671 – Drill Through and AON Protection
- 6908 – Par to CBOEDirect
- 6945 – Early Close By Product
- 7000 – Cancel Replace for Light Orders
- 6704 – CD Series Level Market Indicators
- 7013 - XTP underlying for CFE and ONE_MAIN
- 7007 – Enhanced Security

WR 6814 : Wash Trade Prevention

Goal

The goal of Wash Trade Prevention project is to prevent user's proprietary orders from trading with their own quotes & orders.

Summary of changes

- a) Incoming order with "WTP" contingency (WTP Orders) will be prevented from trading with the same users quotes and orders.
- b) WTP contingency is only allowed for those origins codes set in the trading property "WTP Origin codes".
- c) WTP orders will be treated as express orders (i.e. IOC's) but unlike express orders they would undergo reasonability edit check.
- d) Quote or order from the user will get canceled if it is tradable with the incoming WTP order and its UserId, User Acronym and Sub Account matches with UserId, User Acronym and Sub Account of incoming WTP order.
- e) Quote like orders with WTP contingency will be rejected.
- f) Incoming WTP order marketable with quotes or orders booked outside NBBO will not cancel the quotes due to WTP as there would be no trade.
- g) WTP contingency is not applicable for Complex orders.
- h) WTP orders will not be linked to away exchanges.
- i) WTP orders will not trade through NBBO.
- j) When a booked order or quote is canceled due to incoming WTP user will be given a cancel reason that indicates "WASH_TRADE_PREVENTION"

Turning on – Wash Trade Prevention :

The following properties need to set at the time of GC install and setup appropriately.

Allowed WTP Origin Codes - New trading property is added to prevent orders with WTP contingency to trade with quotes from same user. The user will be able to configure 'Allowed WTP Origin Codes' for a trading class. This is applicable for simple orders only . By default on rollout of this project 'WTP Origin Codes' needs to be set for 'M' and 'N' origin codes.

WR 6671 : Drill Through and AON handling enhancement

Goal

The goal of this project is to support drill through protection for limit and market order during intraday and at the opening. This project also enhances HALO to include AON orders.

Summary of changes

- a) Market orders at the opening will be protected by drill through logic. Order will be able to trade upto protected price, HALO price +/- “MKT order drill through Amt” trading property. After trading at protected price, order will be routed to PAR in W_MAIN and cancelled in C2.
- b) Marketable limit orders(and market orders) entered intraday will also get drill through protection logic as described above.
- c) Stop and stop limit orders when triggered will have drill through price protection (pits 68170).
- d) Opening logic for AON orders is enhanced to include marketable AON orders in the HALO auction.
- e) Spread orders with all the legs with same sides(all buy, or all sell side) will be price protected.
- f) A Spread order with all legs as buy must NOT have price of credit, even or X debit, where X is calculated as product of number of option legs and product tick.
- g) Similarly, A spread order with all legs as sell must NOT have price of debit, even or X credit.
- h) Market and Limit Spread orders trading will be price protected. Whenever spread order trades beyond x% of first trade, that order will be routed to PAR in W_MAIN and cancelled in C2. Percentage price protection is calculated using “price protect percentage” trading property.(pits 65436)

Turning on – Drill through and Aon enhancement :

Drill through and AON enhancement project features will be available as soon as each BC is rolled out. Existing trading properties as described below will be used for these features.

“**MKT Order Drill Through Amount**” trading property will be used to calculate the drill through amount for marketable limit order and market orders.

“**Price Protect Percentage**” trading property will be used to calculate price protection amount for marketable limit spread orders and market spread orders.

WR 6908: Par To CBOEDirect

Goal

The goal of this project is to replace the existing interface (i.e. PAR Server and PAR Adapter) between PAR and Cd by having PAR and Cd communicate directly with each other.

By having PAR and Cd communicate directly with each other, PAR usability and performance will be improved. Additionally, maintenance costs will be reduced because the current interface (PAR Server and PAR Adapter) use a different programming language and usually requires development changes whenever a PAR enhancement is made.

Summary of changes

- 1) Par Client has been changed to talk directly to CBOEDirect by going through a CAS.
- 2) OHS process on the BC has been changed to open the OHS Service so PAR can submit fill reports, TA /TB and other messages.
- 3) New Par Control GUI has been created on the SA GUI to allow monitoring of individual PAR's and being able to run End Of Day, Start Of Day and force log off via this new GUI.
- 4) New Profile maintenance GUI has been created to allow management of PAR user profiles.
- 5) New columns have been added in the order history and Trade report tables to log the name of the workstation to allow for activity queries by workstation.
- 6) New Market Replay application will be installed that will allow PAR to query for Order and trade activity.
- 7) New SHM Alarm management – This functionality allows us to log and clear alarms for unacked orders at PAR. (i.e. if an order is sent to PAR and PAR has not acknowledged as having received this order, then an alarm is logged with the order details and will be shown on SHM).

Rollout

- 1) To rollout this project all applications need to be installed
- 2) CBOEDirect (GC, BC, SACAS, CAS, SHM, SA GUI)
- 3) Market Replay
- 4) CDB & DWH
- 5) Par Client

Par Client needs to be installed last after all applications are in.

When PAR client is installed the OHS code will automatically detect that a new PAR client has logged in and will use the new CBOEDirect style messageing to send orders to PAR.

Fallback

1. To fallback only the PAR client needs to be backed out.. OHS will automatically detect that new PAR client has logged out and the old workstation is logged back in. OHS will automatically switch to using the old style messaging that requires PAR Adapter and PAR Server.

WR 6945 : Early Close By Product

Goal

The goal of this project is to close trading early on products based on their expiration date.

Summary of changes

- a) New trading property “Enable Early Close” has been added to enable early close of products for a trading class.
- b) New attribute earlyCloseTime has been added to TradingSessionService and is updatable via SA GUI.
- c) When the above mentioned trading property is set for a class. The system will use the “early close time” attribute out of the Trading session and close the products that expire that day for that class at the specified “Early Close Time”
- d) Intraday changes to “early close time attribute” & “Enable Early Close” take effect immediately.

Turning on – Enable Early Close By Product :

The following trading property need to be set at the time of GC install. By Default values will be false so functionality will not get turn on until all pieces are installed in production.

- 1) **Enable Early Close** - New trading property is added to verify whether classes are configured for early close by product or not. This is applicable for simple products only which will automatically close strategies. Default value for this trading property is FALSE.

Note A new **-D** has been added to double publish the TradingSessionElement update old and new way. Once all GUI's have been rolled out, this flag can be turned off.

JAVA_ARGS="{JAVA_ARGS} -DdoublePublishTSElementUpdate=true"

WR 7000 : Cancel/Replace for Light Order

Goal

The goal of the Cancel/Replace for Light Orders project is to add a new order interface for Light Orders to accommodate cancel/replace.

Summary of changes

- a) New cmiV10 Interface method is added to support light order cancel/replace functionality, also new logonV2 method is added to support user defined heart beat timeout value:

1. New cmi constant for light order cancel replace reject code in cmiConstants:

```
**
//Light Order Cancel Replace Reject code.
const cmiUtil::ActivityReason MISMATCHED_QUANTITY = 907;
**
```

2. In cmiOrder.idl, new structure is added:

```
**
struct LightOrderReplaceResultStruct
{
    cmiOrder::LightOrderResultStruct originalOrder;
    cmiOrder::LightOrderResultStruct newOrder;
};
typedef sequence <LightOrderReplaceResultStruct> LightOrderReplaceResultStructSequence;
**
```

3. New CMIV10.idl file is added:

```
**
module cmiV10
{
    //-----
    //   Light Order Cancel Replacement Interface
    //-----

    interface OrderEntry: cmiV9::OrderEntry
    {

        cmiOrder:: LightOrderReplaceResultStruct acceptLightOrderCancelReplaceRequest(
            in long originalOrderHighId,
            in long originalOrderLowId,
            in cmiSession::TradingSessionName activeSession,
            in long quantityToCancel,
            in string userAssignedCancelReplaceId,
            in cmiOrder::LightOrderEntryStruct replaceOrder
        )
        raises(
            exceptions::SystemException,
            exceptions::CommunicationException,
            exceptions::AuthorizationException,

```

```

        exceptions::DataValidationException,
        exceptions::NotAcceptedException,
        exceptions::TransactionFailedException
    );

};

interface UserSessionManagerV10 : cmiV9::UserSessionManagerV9
{
    cmiV10::OrderEntry getOrderEntryV10()
    raises(
        exceptions::SystemException,
        exceptions::CommunicationException,
        exceptions::AuthorizationException,
        exceptions::AuthenticationException,
        exceptions::NotFoundException
    );

} ;

interface UserAccessV10
{
    UserSessionManagerV10 logon(
        in cmiUser::UserLogonStruct logonStruct,
        in cmiSession::LoginSessionType sessionType,
        in cmiCallback::CMIUserSessionAdmin clientListener,
        in boolean gmdTextMessaging )
        raises(
            exceptions::SystemException,
            exceptions::CommunicationException,
            exceptions::AuthorizationException,
            exceptions::AuthenticationException,
            exceptions::DataValidationException,
            exceptions::NotFoundException
        );

    UserSessionManagerV10 logonV2(
        in cmiUser::UserLogonStruct logonStruct,
        in cmiSession::LoginSessionType sessionType,
        in cmiCallback::CMIUserSessionAdmin clientListener,
        in boolean gmdTextMessaging,
        in long userHeartbeatTimeout )
        raises(
            exceptions::SystemException,
            exceptions::CommunicationException,
            exceptions::AuthorizationException,
            exceptions::AuthenticationException,
            exceptions::DataValidationException,
            exceptions::NotFoundException
        );

};

};

```

- b) New light order message codec is added to support communication between CAS/FIX and Trade Server processes.
- c) LightOrderHandlingService and BrokerService are modified to implement the new functionality.
- d) Internal order status message codec is added for communications between TradeServer and OHS.
- e) InternnalOrderStatusHandlingImpl is modified to handle the new light order cancel/replace events.
- f) CAS supports new logonV2 method to allow user to define a heartbest timeout value in seconds that user wants. This allows end user to leave market quicker in case communication lost.

CAS has two new configurable system properties in /config/bin/setContext.v2cas01

```
export MIN_USER_HEARTBEAT_TIMEOUT=3 //default 3
export MAX_USER_HEARTBEAT_TIMEOUT=20 // default 20
```

For logonV2 method, userHeartbeatTimeout should be from
MIN_USER_HEARTBEAT_TIMEOUT (3 seconds) to
MAX_USER_HEARTBEAT_TIMEOUT (20 seconds).

If it is less than MIN_USER_HEARTBEAT_TIMEOUT, timeout will be set to
MIN_USER_HEARTBEAT_TIMEOUT seconds, if it is bigger than
MAX_USER_HEARTBEAT_TIMEOUT, timeout will be set to
MAX_USER_HEARTBEAT_TIMEOUT seconds.

- g) New CBOE trader GUI is developed to use new light order cancel replace methods and logonV2 methods.

Note: Rollout of light order cancel/replace will be two step processes. First, the server related changes will be rolled out with 8.8 Release, and second, CMi API and CAS/FIX changes will be rolled out in a later time.

WR 6704 – CD Series Level Market Indicators

Goal

The goal of this project is improve the process related to generating and routing ISO orders to other exchanges.

Summary of changes

Cd Server will make changes to accept the 'away exchange' market indicator data at a series level and update the 'lookup logic' accordingly. The away exchange market indicator is already coming into the trade servers from XTP but is currently being ignored. This change will process the field and update the in-memory view of the away market quote.

Additionally, a bug is being fixed in this release in which the EXCHANGES_INDICATORS field in the mkt_data_hist table was not being populated properly.

Turning on:

This change takes affect immediately upon install. No additional changes are necessary to use the new logic. No additional rollout steps are needed and no additional fallback steps are needed.

WR 7013 – XTP underlying for ONE and CFE (TipsAdapter Elimination)

Goal

The goal of this project is to make the halting of the derivative products faster by moving the processes related to underlying product state determination to the BC.

Summary of changes

- a) XTP process was introduced for each TradeServer(ONE and CFE)
- b) TradeServers(ONE and CFE) was modified to use the UnderlyingMarketData service and UnderlyingNBBOData service in order to communicate with the local XTP.
- c) Product State Service logic was changed to consider ignoreOpenState flag during its product state processing.
- d) Infra's extent map needs to be updated to facilitate communication between local XTP's and their respective trade servers.

Note: No dependencies for BC rollout on XTP and Infra's extent map changes.

Turning on:

This change will automatically take effect when all three steps are complete.

- 1) BC rollout.
- 2) XTP rollout
- 3) Infra extent map changes. [change (d)]

These steps can be completed in any order.

Bugfixes included in this release

#	Remedy PR #	(PITS) Ticket ID	Submitter	Assigned To	Problem Severity	Phase	Problem Description
1	SYS009338	50485	baranski	chenc	Major	Assurance	ISSUE WITH DISABLING AN ACRONYM FROM MEMBERSHIP POSTPONED UNTIL 8.6 GOES I
2	SYS010065	82693	nagayacr	heitj	Major	Assurance	QRM
3	SYS009549	62093	zhangj	likhite	Critical	Assurance	THE USED TO DETERMINE REASNABILITY SHOULD BE IN THE MESSAGE
4	SYS009704	65436	baranski	dowat	Critical	Assurance	WHEN AN ORDER IN COA HITS THE ?PRICE PROTECT PERCENTAGE? THE ORDER SHOULD
5	SYS009846	70699	nagayacr	likhite	Critical	Assurance	WHY DID THE ORDER REJECT (NOT REASONABLE PRICE FOR THIS TYPE OF STRATEGY)
6	SYS009847	70942	nagayacr	pateln	Critical	Assurance	FOR LINKAGE TRADES WE ARE SENDING VALUE OF ?L? IN TAG 9730 TO CLIENTS
7	SYS009914	75105	zhangj	likhite	Critical	Assurance	AIM AON SOLICITATION ORDERS NOT BROADCASTING AUCTION PRICE.
8	SYS009928	75134	zhangj	dowat	Critical	Assurance	CBSX: WHY WAS THE SWEEP & CROSS ORDER CANCELLED
9	SYS009939	75287	zhangj	likhite	Critical	Assurance	CAN SOMEONE INVESTIGATE WHY THE MKT ORDER DID NOT TRADE WITH THE QUOTES
10	SYS009926	76045	zhangj	chenc	Critical	Assurance	OPG ORDERS CANCELED BEFORE HALO ENDS
11	SYS009927	76054	zhangj	chenc	Critical	Assurance	COMPLEX OPG BEHAVIOR
12	SYS009940	76431	zhangj	likhite	Critical	Assurance	MARKET MAKER IS SUBMITTED TO TRADE MATCH IT SHOULD HAVE NO VALUE FOR BILLIN
13	SYS009961	77249	baranski	diddiu	Critical	Assurance	MISCELLANEOUS
14	SYS009436	56105	nagayacr	deshmukh	Major	Assurance	PROPERTYDEFINITIONCACHE:LOADCATEGORY - NO DEFINITIONS FOUND FOR CATEGORY = T
15							
16	SYS009917	68170	nagayacr	chenc	Major	Assurance	STOP ORDER ACTIVATED ON OPEN - DRILL THRU

17	SYS009858	70736	nagayacr	pateln	Major	Assurance	WHY DID NET PRICE ON THE ORDER HISTORY REFLE.07 CREDIT INSTEAD OF .07 DEBIT
18	SYS009899	74463	zhangj	likhite	Major	Assurance	WHAT HAPPENED AND WHERE DID THE ORDER GO, THAT WAS SUPPOSE TO GO TO 9IBFR
19	SYS009908	74948	zhangj	likhite	Major	Assurance	HE LEGS SHOW IN MKT REPLAY AS DEFINED BUT WAS ACTUALLY TRADED AS OPPOSITE.
20	SYS009964	75584	zhangj	dowat	Major	Assurance	WE DID NOT GET THESE FILLS ON RECONNECT AFTER WE MOVED FROM FAILED BK CIRCU
21	SYS009929	75892	zhangj	deshmukh	Major	Assurance	CBSX: BEST QUOTE UPDATES EVEN WITHOUT A BOOK EVENT FOR THE ORDER
22	SYS009982	77550	baranski	likhite	Major	Assurance	WHY DIDN'T THE CANCEL REPLACE ORDER REQUEST GO TO THE OMT 9IBFR1
23	SYS010004	78580	sinclair	deshmukh	Major	Assurance	C.2 8.7 NO BID AIM AUCTION TRADING AT .05 SHOULD CANCEL
24	SYS009991	78959	baranski	chenc	Major	Assurance	COMPLEX ORDERS THAT TRADE WITH EACH OTHER AT OPEN SHOULD HAVE BILLINGCODE O
25	SYS009990	79130	baranski	diddiu	Major	Assurance	CUST TO CUST AIM NEEDS TO TO AUCTION IF MO SENT IN NON STANDARD INCREMENT
26	SYS010055	82358	nagayacr	pateln	Major	Assurance	ITG FUNCTIONAL DEFECT
27	SYS009315	52600	liangc	chenc	Minor	Assurance	THIS ARCHIVING PROBLEM PREVENTS THE CRITICAL REPORTING OF GARBAGE COLLECTIO
28	SYS009501	60539	nagayacr	dowat	Critical	Closed	AON GTC ORDERS ARE BEING CANCELLED BY THE SYSTEM, BUT REMAIN IN THE BOOK .
29	SYS009542	62058	zhangj	chenc	Critical	Closed	WHY WAS THE ORDER SITTING IN THE BOOK NOT TRADING?
30	SYS008813	26459	nagayacr	sinclair	Major	Closed	CBSX ISSUE: CBSX SUB-SESSION FOLDER COLLAPSE
31	SYS008822	28312	zhangj	likhite	Major	Closed	THERE IS NO WAY FOR MARKETMAKERS TO PUT IN ORDERS TO TRADE WITH RESTING COB
32	SYS009495	50665	vazirani	chenc	Major	Closed	A COA ORDER EXPIRES AND BOOKS AS SOON AS A QUOTE FOR ONE OF THE LEGS IS CXL
33	SYS009548	62044	zhangj		Major	Closed	WHY DID THE CPS ORDER SPLIT OCCUR BEFORE THE END OF THE AUCTION?

34	SYS009900	73722	nagayacr	chenc	Major	Closed	WHY ARE WE NOT REPORTING THESE ORDERS IN CORRECTLY
35	SYS009886	74127	zhangj		Major	Closed	FROM THE OPEN AT 8:30, HYBRID HISTORY QUEUE UP TO ALMOST 200,000
36	SYS009983	77558	baranski	likhite	Major	Closed	LATER USER CANCELED ALL QUOTES AND THIS QUOTE DID NOT CANCEL.
37	SYS009984	77635	baranski		Major	Closed	THE SYSTEM WAITS UNTIL THE LINKAGE ORDER TTL EXPIRES BEFORE TAKING ACTION.
38	SYS009476	55303	nagayacr		Trivial	Closed	COMPLEX ORDER ISSUE
39	SYS009526	61527	zhangj	heitj	Major	Closed	THE LOG FILES THAT ARE GENERATED BY SERVER ARE LARGER THAN WHAT'S CONSIDERE

Operator Procedure changes

PAR Monitoring and Control

1. With this release there is a new PAR Control GUI that will allow Helpdesk and operations to execute Start Of Day, End Of Day, Force Log off functionality on PAR.
2. Once all new PAR's are rolled out there would be no need to bring up the PAR Servers and PAR Adapter processes.

PAR End Of Day procedures

1. Once the new PAR's are rolled out there is no need to run any PAR commands on the PAR Servers.
2. Instead At end of Day time "PAR End Of Day" should be run on the PAR Control GUI this will cause all logged in PAR's to print there orders on the BOOTH OMT.
3. If there are any pars that are not logged in PAR Control GUI can be used to force logoff those PAR's

CMI/FIX Changes

Washed Trade Prevention Project

The WTP project has added a new contingency called WASHED_TRADE_PREVENTION at the cmi Layer.

For the fix layer this maps as follows the combination of Tag 18=w and Tag59=3 (IOC)

Infra 14.2 Changes

Summary of changes

- AMQ 5.4.2 PITS 75655
- Changes for how SMS processes users who are forced off. This is for PAR-to-CBOEdirect
- CFLEX specific ExtentMap updates
- Don't connect to monitorURL anymore.
- Remove QRM from the BC DNs ExtentMap.

Appendix A - Database Changes

GC Database changes

New columns have been added to **trading_session_element** table and **trading_session_template** table related to early close by product project.

1. alterTradingSessionElement.sql

```
ALTER table trading_session_element ADD  
(  
    prod_earlyclose_time number(20),  
    auto_earlyclose_prod_ind char(1),  
    extensions    varchar2(128)  
);
```

2. alterTradingSessionTemplate.sql

```
ALTER table trading_session_template ADD  
(  
    prod_earlyclose_time number(20),  
    auto_earlyclose_prod_ind char(1),  
    extensions    varchar2(128)  
);
```

BC Database changes

New columns have been added to **sbtOrderHistory** table and **tradeReportEntry** table.

1. alterSbtRoutedMessagePartition.sql

```
ALTER TABLE SBTRoutedMessage MODIFY PARTITION orderrelated  
ADD VALUES (11, 12);
```

2. alterSbtOrderHistoryParToCD.sql

```
ALTER TABLE sbtorderhistory  
ADD (  
    WORKSTATION VARCHAR2(4)  
);
```

3. alterTradeReportEntryParToCD.sql

```
ALTER TABLE sbt_tradereportentry  
ADD (  
    WORKSTATION VARCHAR2(4)  
);
```

Appendix B – Installation order and pre-requisites

Installation order

Note

Day 0: Make GC and BC database table changes.

Day 1: Install CDB and DWH applications.

Day 1: Install SHM and ICS (No real dependency can go in at any time).

Day 1: Install Master GC1, 2 and 3 (Saturday).

(Set trading properties for WTP, Drill Thru and Early Close by product at the time of install).

Day 2: Regulatory applications

Day 2: New Market Replay Application + New Hardware.

Day 2: Install GC1,2 and 3 Slave side.

Day 2: Setup SHM alarms and monitor

Day 3: Install Master BC's (2-3 weeks, starting one Saturday).

Day 3: Install SA CAS's

Day 4: Install SA GUI's.

Day 4: Install Slave side BC's.

Day 4: Operations and Helpdesk training on new PAR Control GUI.

Day 5: Install CAS's (Internal & external) and FIX/Engines.

Day 5: PAR Client Rollout (Details need to be added)

Day 5: Install Trade GUI's/OMT (New WTP contingency and cancel reason code)

Day 5: Disable double publish of TradingSession Event once all SA GUI's are rolled out remove this line from the setContext file of the GC.

JAVA_ARGS="{JAVA_ARGS} -DdoublePublishTSElementUpdate=true"

Day 6: Set Trading properties for WTP when scheduled to rollout.

Day 7: After PAR client rollout is complete, disable cron job on par svr that ftp's files to DWH servers.

Appendix C – GC Installation Procedures

GC2 A/B Trade engine Installation Procedures

QA Steps

At 3:15 have qa load the new software for release.

Infra group steps after End of all Sessions

Load new ACL. (Need to load only once).

Server Group steps

Most of the steps here can be done at 3:15.

Only if needed fix the setContext file in /sbt/prod/tradeeng directory. After you login, if the setContext version has changed then the setContext version nbr needs to change .

Change run_dir links for previous release.

Change the run_dir link in /sbt/prod/tradeeng to point to the new release.

Logout and log back in as tradengp.

Run script \$RUN_DIR/bin/genWatchedProcessList. Verify that \$RUN_DIR/properties/WatchedProcessListServer.out is generated and that all processes are listed correctly in this file.

Do a diff against the old and new WatchedProcessListServer.out file to ensure they are the same. **DO NOT go any further is this does not work.**

GC1A/B Trade Engine Installation procedures

QA steps

At 3:15 have qa load the new software using the QA setup steps.

CD Server group steps after end of all sessions

1. Verify all GC tables changes have been made.
2. Shutdown tradeengine on GC1.
3. Change run_dir links to point to the new CBOEDirect release.
4. Logout and log back in.
5. Update setContext in home directory if needed.
6. Execute `${RUN_DIR}/bin/initializeEarlyCloseColumns` to update new columns for early close. This is needed on **master side** only.

Note initializeEarlyCloseColumns script is run before any GC processes are started.

7. Start the GC processes.
8. **Master side only:**
Load the Trading property “csv” file as explained (by running the command)

```
TradingPropertyServiceClient setPropertyDefinitions
    $RUN_DIR/properties/TradingPropertyDefinitions.csv
```
9. **Master side only:**
Add new routing properties, firm properties and trading properties as explained
 - Execute `${RUN_DIR}/bin/addAllowedWtpOriginCodes –run` to initialize defaults for the AllowedWTPOriginCodes for all sessions

Note This will give error the first time installing it on a GC box, since property will not be found while quering for it.

- Execute `${RUN_DIR}/bin/addEnableEarlyCloseTradingProperty` to initialize default values for the EnableEarlyClose for all sessions
10. Verify that all the new properties have been setup correctly – TODO (after SA GUI is installed) ?.

Verification after GC Upgrade

Note If you are installing the Slave side box then perform a fail-over so that the upgraded box becomes Master and then continue on with the remainder of the plan.

Check all files (.log, .debug, .out, .err) for errors, exception's and high system alarms.

Enable global external connections on the GC (`globalExternalServices start`).

Start all sessions using the SA GUI

Verify on prdgc01a/b that there are no products in NO_SESSION state.

Use SAGUI to open test products on all the BC's. You can get the list of test classes from operations (This list is taped to one of the monitors in the basement)

Login to 2 trader GUI's and bring up the market display window and status window) on each of the GUI's. NOTE: Status Window is a scrolling display that shows status messages for orders and quotes as and when they occur. (This window can be used to verify that OrderStatus and QuoteStatus events are working).

Do test trades using quotes/orders on atleast one BC for all sessions.

Verify that CurrentMarket (Mkt Bid and Mkt ask) is showing up on the market display window. This tests out that current market events are working.

Verify that the last sale price and quantity fields are showing up on the Market display window. This tests out that Last Sale and Recap events are working.

Verify that Order Status messages (New Order, Order filled are showing up on the Status window screen)

Check all files on prdgc01 (.log, .debug, .out, .err) for errors, exception's and high system alarms.

Verifying MarketDataReportServer - for Last Sale and Recap processing

Run script **createHalfHourlyReport** – nw W_MAIN.

Verify that new report file is generated.

log/HalfHourly_NewsWireReport_latest.xml.log

Review the XML to see if the total volume is updated correctly.

Repeat above for –hvol.

Do not run for –opra as there is no way just to create report and not send. –opra option can be verified on Saturday testing only.

Run ar MarketDataReportServer1 showTickerConsumerStats and verify number messages received.

Do test trade on any test class for W_MAIN.

Run above ar command again and verify total number of events received increased.

Open trader gui and open DSP (Display Series Price) screen and do query for any W_MAIN product. Recap information should be displayed properly.

Open trader gui and open VOL screen and do query for any W_MAIN class. VOL information.

End all the sessions.

Test Complete, Notify operations.

Backout procedures GC1A/B

To backout code shutdown tradeengine and flip the run_dir to the old release that was installed.

Failover procedures GC1A/B

Follow regular GC failover procedures.

MDGC1 A/B Trade engine Installation Procedures

QA Steps

At 3:15 have qa load the new software for release .

Server Group steps

Shutdown tradeengine processes

Most of the steps here can be done at 3:15.

Only if needed fix the setContext file in /sbt/prod/tradeeng directory. After you login, if the setContext version has changed then the setContext version nbr needs to change .

Change run_dir links for previous release.

Change the run_dir link in /sbt/prod/tradeeng to point to the new release.

Logout and log back in as tradengp.

Start Tradeengine processes.

Verification (ONE_MAIN and W_MAIN) – XTP Underlying feed

Verify all .log, .err, .out, .debug for exceptions and alarms.

Put all W_MAIN products in pre-open state (Be care full when doing this on a weekday).

Start tips replay.

Verify products are moving to opening rotation.

Enter a quote on one real product , verify MDH has latest underlying data.

Verification (ONE_MAIN and CFE_MAIN) – Bookdepth Feed

Verify all .log, .err, .out, .debug for exceptions and alarms.

Put all Test classes for ONE_MAIN and CFE_MAIN products in pre-open

Enter Quotes.

Using ar command on CfnAdapter1 enable refresh of Bookdepth on all sessions.

Using cfnAdmin monitor all the 12 Multicast lines (6 fro CFE primary and backup and 6 for ONE_MAIN primary and backup). Full refresh of bookdepth is done every few seconds, you will see your test classes having data in them.

Backout procedures MDGC1A/B

To backout code, shutdown tradeengine and flip the run_dir to the old release that was installed.

Failover procedures MDGC1A/B

Follow regular MDGC 1 failover procedures.

MDGC 2 A/B Trade engine Installation Procedures

QA Steps

At 3:15 have qa load the new software for release .

Server Group steps

Shutdown tradeengine processes

Most of the steps here can be done at 3:15.

Only if needed fix the setContext file in /sbt/prod/tradeeng directory. After you login, if the setContext version has changed then the setContext version nbr needs to change .

Change run_dir links for previous release.

Change the run_dir link in /sbt/prod/tradeeng to point to the new release.

Logout and log back in as tradengp.

Start Tradeengine processes.

Verification

Verify all .log, .err, .out, .debug for exceptions and alarms.

Open all test classes in W_MAIN session.

Have operations bring up an RCN screen.

Enter a quote on every single Test class.

Verify on an RCN screen if quotes have been received on all test classes.

If an RCN is not available you can use mdbAdmin to monitor the data that is broadcast on the broadcast udp ports. NOTE: data is broadcast on 2 networks, you should monitor both the networks. (Monitor some classes on one network and other classes classes on the 2nd network).

Backout procedures MDGC2A/B

To backout code, shutdown tradeengine and flip the run_dir to the old release that was installed.

Failover procedures MDGC2A/B

Follow regular MDGC 2 failover procedures.

GC - Saturday verification after upgrade

#	Description	PASS/FAIL
1	loadOpenInterest test (performed by Ops at startup- requested at weekend test meeting)	
2	Product download test – CAS (performed by Ops at startup)	
3	Restart all CAS & Fix Engines. Verify CAS startup time. (performed by Ops at startup)	
4	Start all sessions using the SA-GUI (performed by Ops at startup)	
5	Verify all products are assigned to sessions and no product is in NO_STATE (Ops at startup)	
6	Run ITG Checkout script on all BC's (performed by Ops at startup)	
7	Transition all products for all sessions to PRE-OPEN state.	
8	Run the XTP replay, replaying the Friday 8:29-8:45 traffic at a 1.5 times rate. Verify that all W_MAIN classes transitioned to OPENING-ROTATION, verify ticker and recap on GUI, Verify underlying price in MDH. Verify broadcast to a PDS. Verifies Data from MDGC1.	
9	OPEN all products for all sessions.	
10	Kill a CAS to verify users are logged out - SMS test	
11	Enter Quote - Book Depth update (dynamic) - CFE/ONE_MAIN Verify that data goes out of CfnAdapter1 on mdgc01 (3 outbound lines for CFE and 3 outbound lines for ONE). ar cfnAdmin monitor raw CFE_MAIN C 1	
12	Generate and verify Half Hourly reports for News Wire and HVOL. Actually sending the file to OPRA can only be verified on the weekend. Only on the weekend can you use the –opra option. * Verify hourly reports are generated every half an hour by Control-M * Run script createHalfHourlyReport – nw W_MAIN . * Verify that new report file is generated. log/HalfHourly_NewsWireReport_latest.xml.log * Repeat above for –hvol.	
13	Examine global log to verify open interest was loaded	
14	Using SA_GUI, spot check some open interest for some of the products. There should be non-zero values for most of the products. It is OK if a few of them have zero values because it might be a result of new series additions.	
15	Run ar MarketDataReportServer1 showStatistics and verify number messages received	
16	Do test trade on any production class for W_MAIN. Note : SATURDAY TESTING ONLY	
17	Repeat step 16 and verify total number of events received increased	
18	Repeat step 13 and verify the reported numbers have increased	
19	Pause XTP Replay.	
20	Perform four BCXX failovers with GC01a is master. Where XX is a single hybrid, CFE, ONE, and STOCK BC.	

21	Run ITG Checkout scripts on the failed over BCs (only). While running proceed to step 23.	
22	Verify that data CM , LS and Product states are going out to PDSs. The PDSs are verified as follows: Verify the PDS Overhead is updating with values from the class being used. Quote and last sale information should change. This verifies the MDB broadcast. Depending on the type of display OPS has configured on their test PDS Overhead, the last sale might not show up. Have them switch screen types until they find the one that shows the last sale. Make sure XTP replay is NOT running during the ITG checkouts. XTP Replay can cause spooling and there would be a possibility of dropped quotes/trades which could cause the test to appear to fail.	
23	Failover MDGC01 and MDGC02 with new GC01a as master.	
24	Verify CFE/ONE_MAIN book depth data is being published by repeating step 12.	
25	FE failover test with GC01a as master. KILL FE03	
26	Restart CAS2011. Verify the cas reinitializes. Run ITG Checkouts on any of the following BC/TE combinations that use FE03. BC04/TS-4 (cas2011) BC10/TS-3 (cas2011) BC30/TS-2 (cas2011) BC82/TS-1 (cas2011) BC90/TS-3 (cas2011) BC93/TS-4 (cas2011) BC98/TS-1 (cas2011)	
27	Start XTP Replay (1.5 rate(. Open the <i>Market Display For Underlying</i> window and verify ticker and recap.	
28	VERIFY BROADCAST TO A PDS. THE PDSs ARE VERIFIED AS FOLLOWS:Verify the PDS Overhead is updating with values from the class being used. Quote and last sale information should change. This verifies the MDB broadcast. Depending on the type of display OPS has configured on their test PDS Overhead, the last sale might not show up. Have them switch screen types until they find the one that shows the last sale.	
29	GC01 Fail over (new to old)	
30	Pause XTP Replay.	
31	RUN CMi and FIX ITG Checkout scripts (all BCs) after the fail over.	
32	Verify Failover times to see how long it takes to do the complete failover (Stop + goMaster + Pre-open products)	
33	Close->PreOpen->Open all products in all sessions. Time the transition from Close to PreOpen	
34	Bounce a CAS to verify it "re-inits"	
35	Verify the CAS startup time against the previous morning startup time using the CAS Start Times script.	
36	Failover GC2.	
37	Run any special procedures provided by infra group on how to verify gc2 failover.	

Appendix D – BC Installation procedure

QA steps

At 3:15 have qa load the new software.

Server group steps after end of all sessions

1. Verify that the BC table changes have been done as explained above (None identified so far).
2. Verify that the default routing properties and trading properties have been set correctly as explained above.
3. Shutdown tradeengine on the BC being installed (tradengp and tradengh login).
4. Install new software CBOEDIR.xxx release, change run_dir links .
5. Start the BC processes (tradengh first and then tradengp logins).
6. Enable business external connections on the master bc.
7. Start all sessions, do a quick quote and order test on one test class on the affected BC.

Verification

Check all files (.log, .debug, .out, .err) for errors, exceptions and high system alarms.

Make sure all initialization is complete on all processes.

Open sessions associated with this bc pair and send a few test orders & quotes, fill one test order and leave a couple of orders in the book. All Test orders should be for customer origin.

Verify if the distributed caches are updated properly **TODO**.

On Master TS run the following commands to verify the counts of different caches

- a) `ar HybridTradeServer1 distributedCache TradingProductCache`
- b) `ar HybridTradeServer1 distributedCache GenericCache`
- c) `ar HybridTradeServer1 distributedCache OrderCache`

On Master OHS run the following commands to verify the counts of different caches

- a) `ar HybridTradeServer1 distributedCache GenericCache`
- b) `ar HybridTradeServer1 distributedCache OrderCache`

When installing the slave side box please verify that the order caches are in synch by running the following commands

a) `status -count` (run this one either on master or slave)

Note The command above will display the order counts on all Trade Servers and the OH Servers on that bc for both master and slave side boxes. If the count of orders is the same on master and slave side we are ok, otherwise there is something wrong with the installation.

On Master and slave TS's run the following commands to verify the counts of different caches are in synch with each other

c) `ar HybridTradeServer1 distributedCache TradingProductCache`

d) `ar HybridTradeServer1 distributedCache GenericCache`

On Master & Slave OHS run the following commands to verify the counts of different Caches are in synch with each other.

a) `ar OHServerHybrid distributedCache GenericCache`

If you are installing the Slave side box then perform a fail-over so that the upgraded box becomes Master and then continue on with the remainder of the plan.

Note We need to do the failover twice, Old Failover style and new Fast Failover before each failover we need to ensure that the caches are in synch while there are orders in the book.

Run the command `businessExternalServices check` to make sure that remote connections are established for the adapters on that bc.

Verify on prdgc01a/b that there are no products in NO_SESSION state.

Use SAGUI to open test products associated with the affected BC's . You can get the list of test classes from operations (This list is taped to one of the monitors in the basement)

Login to 2 trader GUI's and bring up the market display window and status window) on each of the GUI's. NOTE: Status Window is a scrolling display that shows status messages for orders and quotes as and when they occur. (This window can be used to verify that OrderStatus and QuoteStatus events are working).

Run the ITG checkout script on all affected bc's only.

Verify that last sale from affected bc's are showing up on MDRS that runs on the global server.

Check all files on the affected BC's (.log, .debug, .out, .err) for errors, exceptions and high system alarms.

Run the ar command `hsAdmin -c stats -p HybridHistoryServer1` to verify if counts on the HybridHistoryServer are increasing.

Run the ar command `hsAdmin -c stats -p HybridTradeServer1` to verify that counts on the TradeServer are increasing (which means that the TradeServer is sending data to the history server).

Note Some times after end of session the external applications will not allow connections afer hours, so the only way to verify is by looking at the log file to make sure that the program's are making an attempt to connect to the remote system on correct ip address and correct port nbrs.

Final verification

Close all products in all sessions using the SA GUI (Pick the tab to close ALL the products).

Verify memory usage for **all processes** on the BC and Garbage Collection activity by comparing with the OLD and NEW .out files.

End all the sessions

If you started this upgrade on the Slave side perform a fail-over so that the upgraded box becomes Slave now.

Test Complete, Notify operations.

Failover

See operator procedures on how to failover BC's or list instructions specific to your release [here](#).

Fallback

Revert the run_dir link back to the old release and restart tradeengine processes to verify that the release has been backed out.

Saturday BC verification after upgrade

#	Description	PASS/FAIL
	You will need 2 trader gui's and 1 sa gui - login thru all these guis before you start the test. XtpReplay data should be captured on a production day between 8:29-8:45. This applies only if installing on a W_MAIN or W_STOCK BC.	
1	Pre-requisites – Ops has brought up system and successfully ran checkouts	
2	Verify on prdgc01a/b that there are no products in NO_SESSION state.	
3	Ask Ops to verify the “checkout results” e-mail that is sent to the CCS e-mail group when checkouts complete. There should be 3 e-mails for CMI and 3 e-mails for FIX.	
4	Verify XTP Data is being received by the trade servers, Underlying recap (W_MAIN), BOTR exchange indicators (W_MAIN and W_STOCK using a production class) - Verify using ar commands on the bc (on the Trade Servers)..	
5	Using a Trader GUI, do MDH Queries and verify NBBO and exchange indicators.	
6	Run the following commands to get counts. These commands will be run again after ITG checkouts. The counts should increase. Run ar MarketDataReportServer1 showStatistics on the GC and note the number of messages received. Run “hsAdmin –c stats –p HybridHistoryServer1” to get count Run “hsAdmin –c stats –p HybridTradeServer1” to get count	
7	Run ITG checkouts for the BC being installed.	
8	WHILE ITG CHECKOUTS ARE RUNNING - Verify current market, last sale, trade reports, fill reports over all external connections. Enter a quote, order, and trade for a production class for the W_MAIN, W_STOCK, W_ONE, W_CFE sessions. CTMr – verify there are no un-acked trade reports. This can be verified via the following command: (TO DO: Insert command here) COPP – This is for W_MAIN. verify the COPP GUI shows a queue being build for the OPRA lines. This will be true if COPP was brought up <i>without</i> OPRA being live and <i>without</i> the OPRA simulator being up. These conditions result in no place for COPP to send the data and it will queue inside COPP. FOPP-ONE – This is for ONE_MAIN. verify the FOPP-ONE GUI shows an increase in the number of messages that were sent out the outbound lines. FOPP-CFE – This is for CFE_MAIN. verify the FOPP-CFE GUI shows an increase in the number of messages that were sent out the outbound lines. STOPP – This is for W_STOCK. verify the STOPP GUI shows a queue being build for the outbound lines. This will be true if STOPP was brought up <i>without</i> STIC/NASDAQ being live and <i>without</i> the STOPP simulator being up. These conditions result in no place for STOPP to send the data and it will queue inside STOPP. PDS - This instruction only applies if you are installing a W_MAIN BC. Verify the PDS Overhead is updating with values from the class being used. Quote and last sale information should change. This verifies the MDB broadcast. Depending on the type of display OPS has configured on their test PDS Overhead, the last sale might not show up. Have them switch screen types until they find the	

	one that shows the last sale. Make sure XTP replay is NOT running during the ITG checkouts. XTP Replay can cause spooling and there would be a possibility of dropped quotes/trades which could cause the test to appear to fail.	
9	Run the following commands to get counts. The counts should have increased from the values obtained before the ITG Checkout Run MDRS Admin Request on GC to show “last sale” count Run “hsAdmin -c stats -p HybridHistoryServer1” to get count Run “hsAdmin -c stats -p HybridTradeServer1” to get count	
10	If this is a BOB BC installation Operations or on site support staff need to enter a manual price report in for one of the products on the Trader GUI. The last sale column should be updated. Check, MDH, there should be an entry for this last sale.	
11	Verify Order Cache is in synch before failover (This requires master and slave to be upgraded with the same 8.6 release – If not done on Saturday then this step needs to be done on the day when the slave bc is installed) Run the command ‘status -count’ once to display count of orders in the distributed cache on both master and slave side. Verify that the counts of orders are same on both master and slave bc’s.	
12	Verify all other Caches are in synch before failover (This requires master and slave to be upgraded with the same 8.6 release - If not done on Saturday then this step needs to be done on the day when the slave bc is installed) On both master and slave bc’s run the following commands to compare the counts of individual caches On TS’s run the following commands a) ar HybridTradeServer1 distributedCache TradingProductCache b) ar HybridTradeServer1 distributedCache GenericCache On OHS’s run the following commands b) ar OHServerHybrid distributedCache GenericCache	
13	BC Failover test, We need to repeat the section below for a) New BC – Old BC : Old Style Failover b) New BC – New BC: Old Style Failover (can be done when slave is installed) c) New BC – New BC: New Style Failover (can be done when Slave is installed)	
14	For the BC being installed, use the procedures as listed in the operator procedures and have ops execute the BC failover over procedures.	
15	Time the fail over, it should take roughly 3 minutes for Old Failover & 200 Millis for Fast Failover.	
16	After the fail over run the ITG checkout script on all BC’s.	
17	Enter Manual Price Report – Verify Last Sale Update – Verify MDH entry <u>If installing on a BOB BC: (otherwise, skip this step)</u> Enter Manual Quote – Verify Current Market Update Enter Manual Price Report – Verify Last Sale Update – Verify MDH entry	
18	Open DSP (Display Price Series) screen and check information displayed for product. The DSP screen is opened on the Trade GUI using a login that has a <i>price reporting</i> roll.	
19	Close the products, End the sessions and verify that all the sessions have ended successfully.	

Appendix E - LC Installation procedures

QA steps

At 3:15 have qa load the new software.

Server group steps

Notify help desk that LC will be upgraded and that next day they may need to remount the log directories on their CMC Viewer PC's.

Master or Slave side can be upgraded after 3:15. There is no need to wait for End Of Session.

If installing the master side box shutdown tradeengine processes on the Slave Side first then shutdown tradeengine processes on the master side.

If installing the slave side then Shutdown tradeengine processes on the Slave side.

Change run_dir links to point to the new release.

Only if needed fix the setContext file in /sbt/prod/tradeeng directory. After you login, if the setContext version has changed then the setContext is not run and you will not be able to start any process.

Note Delete orun_dir and move run_dir to orun_dir. Helpdesk needs "orun_dir" to look at old Linkage log files.

Logout and log back in as tradengp.

Have operations bring up tradeengine processes using PATROL

If this is the slave box then failover and run thru the verification steps listed below.

Verification

Check all files (.log, .debug, .out, .err) for errors, exceptions and high system alarms.

Make sure all initialization is complete on all processes.

If you are installing the slave side box then installation is complete. (Just make sure operations runs the slave box in master mode the next day).

Verify memory usage for **all processes** on the LC's and Garbage Collection activity by comparing with the OLD and NEW .out files.

Just pick a test class and send the out bound Order, it will get cancelled in the "Fix Linkage Adapter" with a reason code of Away Exchange cancel (199).

Appendix G - CAS & SA CAS Installation procedures

- Follow CAS Production Installation and CAS Component configuration documents for standard installation.
1. CAS has two new configurable system properties in /config/bin/setContext.v2cas01
export MIN_USER_HEARTBEAT_TIMEOUT=3
export MAX_USER_HEARTBEAT_TIMEOUT=20

Appendix H - FIXCAS Installation Procedures

- Follow CAS Production Installation and CAS Component configuration documents for standard installation.

Appendix I - MDCAS Installation Procedures

- Follow CAS Production Installation and CAS Component configuration documents for standard installation.

Appendix J - CFIX Installation Procedures

None. Manual installation is needed.

Appendix K - MDX Instillation Procedures

- Follow CAS Production Installation and CAS Component configuration documents for standard installation.

Appendix L - Performance tests

Nbr	Test	Scenario