CBOEDirect Release Notes

CBOEDIR_8.3.6

July 16, 2010

Table of Contents

Overview of changes in this release

Work requests included in this release

WR 6665 FIX (CAS) GC Latency Short term cleanup

WR 6629 CAS Cache Framework

WR 6630 FE Product Cache Enhancement

WR6665 – FIX (CAS) GC Latency Short term cleanup

Goal

The goal is to eliminate conditions that lead to outliers in CAS performance, most notably reducing creation of new objects so that JVM garbage collection runs (and creates delays) less frequently.

Summary of changes for client side

Minimize Object creation of Calendars, DateFormatters, NumberFormatters., etc.

Reduce unnecessary logging; convert String, StringBuffer use to StringBuilder, etc.

Reduce unnecessary syncronizations, etc.

WR6629 – CAS Cache Framework

Goal

The goal of this task was to improve overall cache lookup time for better performance.

Summary of changes for client side

Several approaches were taken to improve overall cache lookup time and to eliminate outliers. These approaches include

- Removal of unnecessary synchronization during concurrent read.
- Modifying underlying implementation of cache to use in-memory cache instead of ehcache in some cases.
- Modified the Cache look up keys to avoid string manipulations and avoid creating unnecessary garbage.
- Implemented Cache look up keys to use OSI logic internally so that caller need not to worry about OSI turned on or off.
- Modified logging to log look up timings in case it takes longer than 100 micro sec.
- Exposed cache lookup API directly to FIX layer so that FIX layer to CAS layer communication can be avoided for cache lookup.
- Removed unnecessary log messages for strategy cache updates.

WR6630 – FE Product Cache Enhancement

Goal

Improve responsiveness of CBOEdirect as seen by Firms and reduce outliers caused by Global lookups of product, class, and strategy information.

Summary of changes for client side

- ProductQueryService on FECache - All ProductClass, Class, Product, and Strategy information will be cached in the FECache's ProductQueryService so that it can be retrieved more rapidly than if it was necessary to go all the way to Global to retrieve. Caches will be preloaded at FE startup and will update during the day as necessary from update events.
- TradingSessionService on FECache - Similar to the ProductQueryService, the TradingSessionService will cache SessionClass, SessionProduct, and SessionStrategy information in the FECache to increase performance by reducing calls to the Global.

Bug fixes included in this release

SEDL	PITS	Test Plan	Assigned	Date	Origin	Status	Description
8806	27443		Kai	4/1	Production	Submitted	RTT log message change to High System Alarm
8788	27199		Santhan	4/6	Production	Submitted	CFE Futures origin code of D converted to V
8785	24818	Yes	Magic	3/18	Production	Submitted	Strategy order creation defaults to Put if C/P not specified
8902	32873		Brian	5/26	Production	Submitted	Uncaught exception when OMT user enters orders
8974	37890	No	Kai	6/18	ATG	Submitted	Booth OMT cannot cancel/replace a Complex Order directed to that Booth OMT
8986	–	No	Rick	6/11	ITG	Submitted	No NewOrder message sent to application.
8985	38375		Magic	6/17	ITG	Submitted	FIXCAS OutOfMemory responding to Security Definition Request
	38523		Magic	6/18	ITG	Submitted	Two-step Strategy creation does not create Strategy
	38534		Magic	6/22	ITG	Submitted	Incorrect error message LegMaturityDate missing when product key is supplied
	38542		Magic	6/22	ITG	Submitted	Appia rejects Futures and Stock CurrentMarket and Recap messages in response to user request.

Outage related enhancements

None

Outlier related enhancements

None

Performance related enhancements

Rate Limit Enhancement (Session level start time)

CompileThreshold set to 100 for FIX. (previously released as critical fix)

Operating System enhancements

- Solaris 10 update 8
- Tunables
- jdk1.6.0_18 build 7

Configuration and development/performance testing related enhancements

None

Other enhancements included in this release

Refined TTE Quote emit points with separate names.

Added Floor OMT order entry TTE point.

Rates File configuration fix for ONE MD FIX.(previously released as critical fix)

Strategy Order defaults to Put if C/P not specified

SEDL 8785 Test Plan

Detailed Defect/Enhancement Description:

This defect applies only to Orders submitted via the FIX interface which use the “One-Step Strategy Creation” mechanism. (see fix-03c). The Strategy creation process works by composition of the leg products into the strategy product. There was no validation of "required" attributes being entered the for the leg products. That resulted in a default "put" attribute being used when the Put/Call attribute was not entered. The strategy creation process now tests to see if the "required" attributes are entered. Defaults are no longer accepted for a “required” attribute. Missing “required” attributes will generate an “order reject” execution report.

Test Plan

1. Submit a One-Step Strategy Order via FIX which incompletely specifies one or more of the leg products by omitting one or more of the required attribute tags needed to specify the leg product. E.g., the required attributes for a Strategy Option Specification are:
    a. Product Type
    b. Symbol
    c. Expiration Date
    d. Side
    e. Strike Price
    f. Put/Call
    g. Leg Ratio

    The “tags involved will depend on whether this is a “simple” complex order or a “paired” complex order (see fix-03c).
2. The order will be rejected with an appropriate Text description.
3. Submit a One-Step Strategy Order via FIX which correctly specifies the leg products.
4. The order will be accepted.

Summary

Test Setup

Weekend FE Testing

In order to test the effects of the FECache changes on both memory footprint and startup times it is necessary to do a weekend FE test before rolling the 8.3.6 load on the production FEs. The following is the test plan for this weekend testing that will be done before, or very early in, the rollout process.

Weekend FE Test Plan

1. Install 8.3.6 load on prdfe03.
2. For the purposes of comparing startup times of the existing FECache load and the new load, bring up another FE, i.e. prdfe06, in debug mode.
3. Bring up prdfe03 in debug mode.
4. Analyze FE startup times. The FECache will take much longer than usual to startup because it will now cache class, product, and strategy information.
5. Analyze memory footprint of FECache process. New caching will result in the FECache process having a larger memory footprint.
6. Analyze class/product/strategy cache sizes from FECache.log file. Search for following string in FECache.log: “Cache size:”.
7. Enter new products or strategies into the system and check for messages in FECache.debug stating that product/strategy has been added. Search for the following strings: "ProductUpdateConsumer.updateProductClass called", "ProductUpdateConsumer.updateProduct called", "ProductUpdateConsumer.updateProductStrategy called".
8. Run Order and Quote tests from CASes that use FE03.
9. Bring down the FE processes on prdfe03.
10. Rollback to the current production FE label.

Implementation Plan 8.3.6 for C1

See CBOEDIR_8.3.6_Rollout_Plan.xls.

Installation procedures – FE hosts

QA steps

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

Evening Installation Procedures - Infra group steps after end of all sessions.

Update extent maps on GC2 (prdgc2a prdgc2b) so that FECache can receive TradingSession.

Evening Installation Procedures - Server group steps after end of all sessions.

In 8.3 FE was installed with special manual procedures so that it would use jdk1.6.0_14. This automated rollout should move to jdk1.6.0_18 build 7. Check these files

/sbt/prod/tradeeng/run_dir/bin/setContext.jvm.1.6

/sbt/prod/infra/.setenv

to make sure that they contain the line

export JAVA_HOME=/usr/local/jdk1.6.0_18

Ensure that the JDK is build 7. The command
/usr/local/jdk1.6.0_18/bin/java –version
should print out several lines, including

```
Java(TM) SE Runtime Environment (build 1.6.0_18-b07)
```

For the FECache process, validate the following VM parameters by checking pargs.
Added: -d64, -XX:+UseCompressedOops
Removed: -Xss128k
Changed: -XX:PermSize=128m from -XX:PermSize=64m,
-XX:CMSInitiatingOccupancyFraction=60 from -XX:CMSInitiatingOccupancyFraction=40,
-Xms4096m from -Xms1780m, -Xmx4096m from -Xmx1780m

Operation Notes

The FE processes will take much longer to start up, starting with CBOEdirect 8.3.6.This is especially true for FECache, which now retrieves much more data at startup. In one weekend production test this process took about 5 minutes.

Installation procedures – SACAS hosts

QA steps

On installation day after end of trading, deliver planned INFRA and SBT releases and scripts to designated SACAS and SAGUI boxes.

Client group steps

Ensure that Help Desk users are logged out of SAGUI before installing new version!

Refer to ***CASProductionInstallation.doc*** and follow the implementation procedures.

Verify that SACAS is configured to use JDK 1.6.0_18 build 7.

GUI group steps

Install SAGUI on one box (possibly 2 or 3 boxes) so that SACAS can be verified.

Verification

Verify that each SACAS rolled out is visible in Patrol.

Use new SAGUI to log on and ensure that it receives data from SACAS. In particular, check the User Management Window, the Product Class Groups window, and the Product Definition window.

On the first day of SACAS rollout, check all files (.log, .debug) for errors, exceptions and high system alarms.

Fallback

Follow the standard backout procedure.

Installation procedures – CAS hosts

QA steps

On installation day after end of trading, deliver planned INFRA and SBT releases and scripts to designated CAS boxes.

Client group steps

Refer to ***CASProductionInstallation.doc*** and follow the implementation procedures.

Verify that CAS is configured to use JDK 1.6.0_18 build 7.

Verification

Verify that each CAS rolled out is visible in Patrol.

If today's rollout included a floor cas (cas0014, cas0015, cas0016, cas3005), use a Trader GUI to connect to it and make a trade using a test symbol. Ensure that the MarketDisplay window uses MDX. If possible, do two tests, one with a product in session W_MAIN and one with a product not in W_MAIN.

On the first day of CAS rollout, check all files (.log, .debug) for errors, exceptions and high system alarms on the CAS host and on the appropriate FE pair.

Fallback

Stop CAS and Infra processes.

Client Group will change the run_dir and v2cas* directories to previous release.

Operations will start Infra and CAS processes via Patrol.

Installation procedures – FIXCAS hosts

QA steps

On installation day after end of trading, deliver planned INFRA and SBT releases and scripts to designated FIXCAS boxes.

Client group steps

Refer to ***CASProductionInstallation.doc*** and follow the implementation procedures.

Verify that FIXCAS is configured to use JDK 1.6.0_18 build 7.

Verification

Verify that each FIXCAS rolled out is visible in Patrol.

On the first day of FIXCAS rollout, run a FIX script to connect to the FIXCAS and make a trade using a test symbol. If possible, do two tests, one with a product in session W_MAIN and one with a product not in W_MAIN.

On the first day of FIXCAS rollout, check all files (.log, .debug) for errors, exceptions and high system alarms.

Fallback

Stop FIXCAS and Infra processes.

Client Group will change the run_dir and v2fixcas* directories to previous release.

Operations will start Infra and FIXCAS processes via Patrol.

Installation procedures MDCAS hosts

QA steps

On installation day after end of trading, deliver planned INFRA and SBT releases and scripts to designated MDCAS boxes.

Infrastructure group steps

Set up MDCAS to use JDK 1.6.0_18 build 7.

Configure INFRA installation.

Verify as Operations runs startInfraSystem.

Client group steps

Refer to ***CASProductionInstallation.doc*** and follow the implementation procedures.

Verification

Ensure that Infra System and MDCAS processes start successfully when Operations starts them.

On the first day of MDCAS rollout, check all files (.log, .debug) for errors, exceptions and high system alarms.

Fallback

Follow the standard backout procedure.

Installation procedures – CFIX hosts

QA steps

On installation day after end of trading, deliver planned INFRA and SBT releases and scripts to designated CFIX boxes.

Client group steps

Refer to ***CASProductionInstallation.doc*** and follow the implementation procedures.

Verify that CFIX is configured to use JDK 1.6.0_18 build 7.

Verification

On the first day of CFIX rollout, check all files (.log, .debug) for errors, exceptions and high system alarms.

Fallback

Follow the standard backout procedure.