

Information Memo



11 Wall Street
New York, NY 10005

Trading Technology

August 2nd, 2007
(Update to June 4th, 2007 "NYSE Group
Equities Streamlining" Info Memo)

TO: ALL MEMBERS, MEMBER ORGANIZATIONS and Vendors
Interfacing with the Common Message Switch (CMS)

SUBJECT: **Connectivity to Common Customer Gateway (CCG) and
Improved Latency to the NYSE Market.**

Route To: **Technology and Operations Officers**

During the 1st half of 2007, the NYSE successfully implemented several changes to its systems and infrastructure that have greatly reduced order flow latency within the NYSE Trading systems from approximately 290 milliseconds (ms) down to approximately 110 ms.

In the 2nd half of 2007, the NYSE plans to implement a series of significant Trading System enhancements that will further increase the NYSE's speed of delivery of orders, execution and messaging capabilities. We will continue to strive to reduce these latency numbers to benefit you, our valued customer, and the order flow that you transact through Exchange systems. Our challenge and commitment in 2007 is to manage this transformation as quickly and effectively as we can to ensure a smooth transition.

A new Common Customer Gateway (CCG) for interfacing to the NYSE Trading Systems is currently scheduled for implementation in the 4th quarter of 2007. This new gateway architecture represents significant improvements in performance and functionality over the existing Common Message Switch (CMS) interface. CCG leverages the high-performance Trading Connectivity Management (TCM) messaging server developed by NYSE TransactTools and is used widely across the industry today for high volume, low-latency electronic trading. In 2008, we will be extending the new CCG interface as the one Common interface for all NYSE Euronext product offerings including the Arca Matching Engine (ME), Matchpoint, Bonds, Options, CBS (Common Broker System), etc. The implementation of CCG will be done in various phases to allow for a smooth changeover for internal systems and firm migrations. The details of the updated Phase 1 plan and the future Phase 2 enhancements are included herewith in.

CCG – Overview

The NYSE and NYSE Arca today use two different platforms (CMS, Arca Gateway) with various protocols to interface to our order providers. Our ultimate objective is to converge the platforms onto a common interfacing system that will be capable of handling cash equity order flow, and in the future, any product line the NYSE introduces and trades. With this consolidation, firms will have the ability to consolidate their points of entry and realize cost savings. While the NYSE will continue to support the current protocol choices, we will standardize our protocol to FIX.

Phase 1 – CCG Connectivity and Firm Migration

In Phase 1, the CCG will provide the capability to route NYSE FIX 4.2 protocol orders, cancels and cancel with replacement messages directly to SuperDOT for execution on the NYSE Market. We highly recommend that **FCS protocol users** begin their migration from CMS to CCG as early as possible, as your firm is expected to realize reduced latency of approximately 30 ms when routing these messages to the existing NYSE Trading system and, in the future, be in a position to route messages significantly faster to the new NYSE DBK. During this transition from the CMS supported protocols to the NYSE FIX 4.2 protocol into CCG, we will ask you to begin this migration on a firm mnemonic basis.

Beta Testing will be available mid-August 2007.

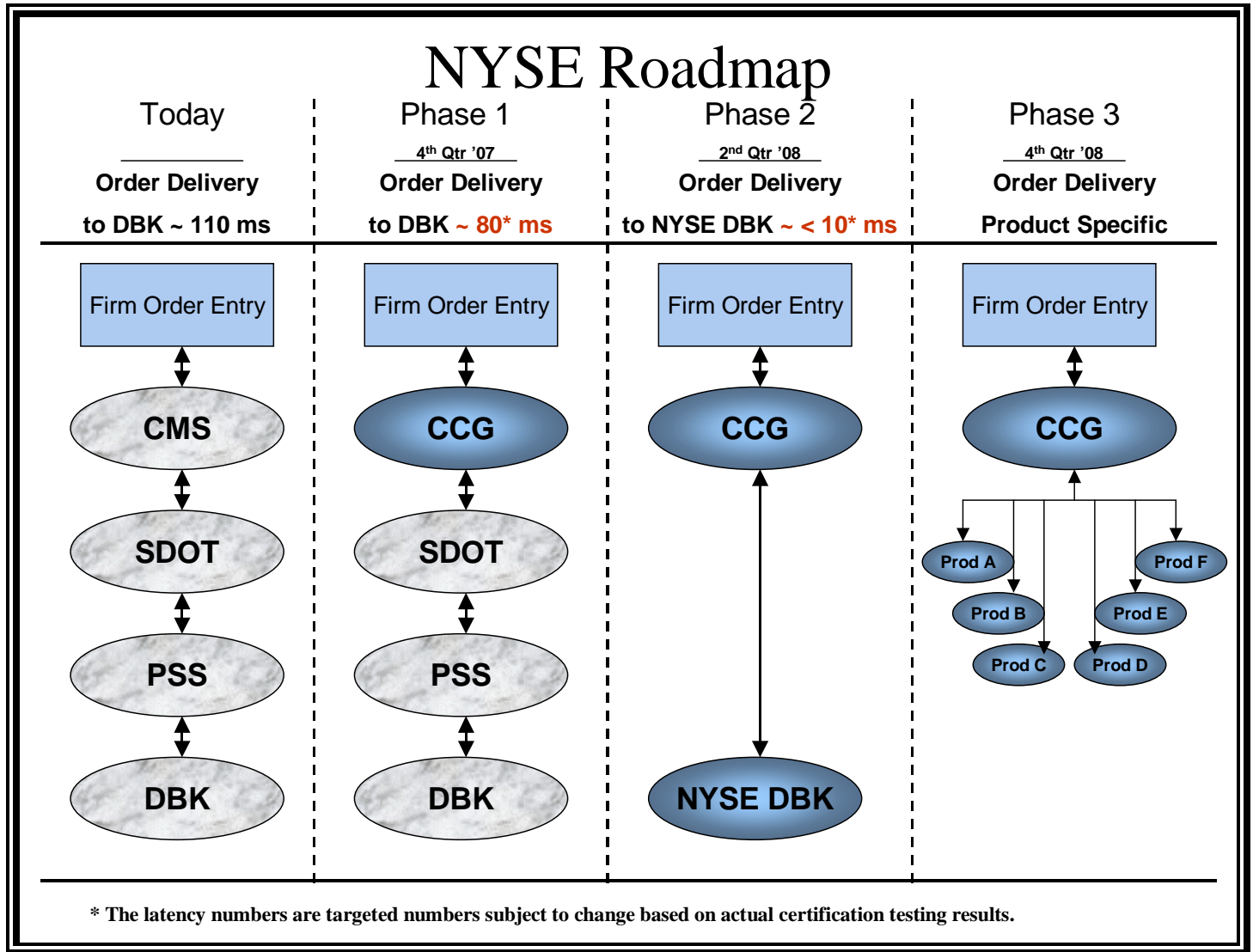
Full Functionality Testing will be available mid-September 2007.

Phase 1 is targeted for implementation in 4th quarter of 2007.

To facilitate the migration process for our customers, please refer to the attached “**CCG Connectivity FACT Sheet**”. This FACT sheet will provide contact information for Member Firm Customer Service, NYSE Relationship Manager and Business representatives. It will also provide a link to the NYSE FIX 4.2 Specification, testing process and procedures, and direction regarding your existing open orders.

A CCG FAQ has been included for your reference at end of this notification.

The following NYSE Roadmap diagram illustrates the CCG migration phases planned through the end of 2008. It also reflects the anticipated latency improvements that will be achieved, from Firm order entry through CCG to the existing DBK and to the new NYSE DBK through CCG with the elimination of SDOT and PSS. Approximate numbers for order delivery to other products in Phase 3 are not available at this time. The approximate latency reduction for each phase can be determined by subtracting the order delivery time from the previous phases' order delivery time.



Phase 2 – Stock Migration to the New NYSE DBK

In phase 2, the functions performed by **SuperDOT** will be transferred to other systems within the NYSE infrastructure in a more distributed and scalable manner. In addition to improved latency, we anticipate that this change will also have a positive impact on our ability to add capacity in a more granular, scalable way. We believe that a 90% reduction in latency can be achieved with this effort.

CCG will provide to migrated firms, the ability to take advantage of the stock symbol migration to the new faster NYSE DBK, thereby providing significant latency improvements (expected to be less than 10 ms). The NYSE will coordinate this symbol migration to the new NYSE DBK with close communication to our customers.

Once the stock migration to NYSE DBK has been fully implemented, NYSE will evaluate plans to streamline the FIX protocol as part of our plans in supporting Phase 3. This new standardized format will be made available in 2008 along with additional information pertaining to Phase 3.

Summary

These exciting changes are scheduled for the 4th quarter of 2007 and 1st half of 2008. In fact, we are already working on the New NYSE DBK. Those changes, along with the infrastructure changes, will be announced in the coming months.

Thank you for your continuing commitment to the NYSE, and please be assured that we are working hard to make the NYSE the best place to trade – the best prices, the most liquidity, the most choices and the lowest fees – all adding up to *your* NYSE.

If you have any business questions relating to the CCG migration phases, please contact your NYSE Relationship Manager or John Limerick at (212) 656-3099.

For technical type information, testing arrangements and/or questions please contact the **Service Desk at 1-866-873-7422 or send an email to sfti@siac.com** - please place “CCG” in the subject line.

CMS to CCG Migration Changes

The protocol and functionality changes that will be implemented as part of **Phase 1** are listed below.

Current NYSE Market Equities Trading functionality remains, unless explicitly stated otherwise.

1. Protocol

- 1.1. CCG will support only FIX 4.2.
- 1.2. For many session errors, CMS sends a logout with FIX Tag <58> - Text fields indicating the error condition, followed by a disconnect. CCG will simply drop the connection.
- 1.3. CCG will support customized 9000 series user tags.
- 1.4. CCG will not enforce the existing maximum size limitation of 999999 for FIX Tag <34> - MSGSeqNum.

2. Service Changes

- 2.1. CCG will not route orders to AMEX. If CCG receives an order with a routing code designating “A” for AMEX, the order will be rejected back to the originator.

3. Drop Copy Changes

CMS Drop Copy is a copy of an order, execution report or admin response that is sent from CMS back to the firm on a line designated by that firm. With the implementation of CCG, Drop Copy will change as follows:

- 3.1. For CCG, the Drop Copy configuration will be different from CMS. Due to the CCG architecture, multiple Drop Copy connections may be required for a firm. During the firm migration phase, it may be necessary for the firm to support existing CMS Drop Copy lines to continue to receive drop copies from firm mnemonics that have not migrated to CCG.
- 3.2. CCG will reject inbound traffic on Drop Copy connections.

Note: SIAC Customer Service will guide the firms and their Drop Copy configuration requirements during the CCG testing and migration phase.

4. The NYSE Market Order terms listed below are planned for elimination. If they are received by CCG, the order will be rejected back to the originator.

- 4.1. Or Better modifier (Tag 40 = 7)
- 4.2. Try to Stop (Tag 9438 = T)

5. General Messaging Changes

- 5.1. CCG will not perform validation guaranteeing firm mnemonic, branch code and sequence number uniqueness.

The entering firm will be responsible for guaranteeing firm, branch and sequence uniqueness in FIX Tag <11> - ClOrdId. It is recommended that FIX Tag <55> - Symbol also be part of the uniqueness criteria.

If multiple orders are received with the same firm, branch, sequence and symbol, SuperDOT may cancel the incorrect order when a cancel request is received.

- 5.2. CCG will require all orders and cancel with replacement orders contain an Exchange designation:
FIX Tag <207> – Security Exchange

If CCG receives an order or cancel with replacement order with the routing code designating “N” for NYSE and the symbol is not traded at the NYSE, the order will be rejected back to the originator.

- 5.3. CCG will require all orders and cancel with replacement orders to contain an Account Type:
FIX Tag <47> - Rule 80A or FIX Tag <9460> - OrderCapacity2 for account type “Q”.

If CCG receives an order or cancel with replacement order that does not contain an Account Type, the order will be rejected back to the originator.

- 5.4. CCG will not support Order Status Request, Message Type “H”.
- Order Inquiries – FIX Tag <9424> – OrdStatReq (i.e., Report Status “1”, Confirm Order Rcvd “2”, Confirm Out “3”)
 - Report Inquiries – FIX Tag <9443> – RepStatReq (i.e., Check Price “1”, Confirm Contra “2”, Confirm Qty Executed “3”)
- Note:** CCG will support unsolicited admin responses (i.e., UROUT, Nothing Done).

- 5.5. CCG will not support the following services:
- Price Filtering
 - Algo Routing – FIX Tag <143> – Target Location ID must be designated for an order to be routed to a Booth and Tag <57> (TargetSubID) = 4 (OVR-overrides preset booth routing parameters)

- 5.6. CCG may provide reject text in Tag <58> that differs from what CMS sends today.

- 5.7. CCG will provide Specialist “PRIN” Copies and Odd lot Alarms in FIX format, not templates.



Member Firm Customer Service CCG Connectivity FACT Sheet

Below is information that you will need in order to test and implement your connectivity to the Common Customer Gateway (CCG) for access to the NYSE trading systems.

Contact Number	Member Firm Customer Service at 1-866-873-7422
Protocol	NYSE FIX 4.2.
FIX Spec	<p>The NYSE Euronext FIX Service Interface Specification and User Guide Version 3.2, dated April 13, 2007 is the FIX Specification to be used. It may be obtained by selecting the specification described above from a list by using the link below.</p> <p>http://www.nyse.com/content/publications/1043269645619.html OR contact the Service Desk by calling 866-873-7422 or e-mailing sfti@siac.com.</p>
Mnemonics	The preferred method for testing your access to the NYSE via CCG is to use a currently unused NYSE mnemonic or to request a new mnemonic for this purpose.
Testing	<ol style="list-style-type: none"> 1. Assign a mnemonic for testing with CCG. 2. Contact Member Firm Customer Service at 1-866-873-7422. 3. Connectivity and application format testing will be conducted using an automated tool (TestAid). Orders can be sent in and automated responses will be sent back to your firm. 4. Testing using DBK (Display Book) will be conducted for verifying cancel and cancel/replaces processing. 5. Manual testing will be conducted to validate CCG functionality. An analyst will be assigned to your firm to go through a script verifying full firm application and session level functionality.
Initial Implementation	A new session will be created for your firm using the mnemonic that you have been testing (either a currently unused NYSE mnemonic or a new mnemonic). After running in production for a couple of days, both your firm and SIAC will be assured that any possible problem with the new protocol would have been addressed.
Open Orders	After the initial implementation, your firm can schedule the migration of your remaining mnemonics. Contact Member Firm Customer Service at 1-866-873-7422 to discuss and schedule the conversion of your open orders.
Business Questions/ Contacts	Contact your NYSE Relationship Manager or John Limerick at the NYSE at (212) 656-3099.

Member Firm Customer Service **CCG FAQ**

The purpose of the following pages is to highlight certain frequently asked questions and to provide additional guidance on CCG connectivity.

Q1: What is CCG?

A1: CCG is the Common Customer Gateway application that is designed to be the strategic entry point for any user planning to transact business with any NYSE Euronext system. Our initial implementation of CCG will provide significant improvements in performance and functionality over the existing CMS interface. In the future, CCG will be updated to be the exclusive means for customers to transact business with all NYSE Euronext products: Arca equities, options, bonds, and any other future NYSE Euronext products. We will keep you updated as future specifications and dates are formalized.

Q2: I see that CCG is being implemented in multiple phases. What are the differences in each of these phases?

A2: CCG is being implemented in phases so that our customers can incrementally benefit from the advantages of each upgrade rather than having to wait until final functionality is available. In the first phase, **CCG to SDOT**, CCG is being introduced as an independent order entry path for orders being sent to the NYSE trading floor. Orders will not traverse CMS but, instead, will be sent to CCG and then passed directly to SDOT. Taking the CCG to SDOT path, the customer should expect to benefit from a sizeable reduction in latency. CCG will be responsible for receiving orders, performing field validations, and then routing orders to SDOT. In the next phase, **CCG to NYSE DBK**, the customer will benefit from a substantial decrease in net order latency resulting from the total elimination of all legacy order path processing. The details and schedules for each of these phases follow in this FAQ.

Q3: What do I have to do if I want to migrate to CCG?

A3: In the near term CCG will support only the NYSE FIX protocol, version 4.2. Firms that currently use FIX 4.1 will have to migrate to FIX 4.2 to use CCG. The CCG FIX version has minor changes in addition to NYSE FIX that must be taken into account. These differences are explained in a separate technical notification.

Q4: You spoke about latency improvements but you haven't given me any details. What can I expect?

A4: CCG testing has not been completed so the latency figures are estimates based on what we've designed and what we are expecting from this product. However, based on the performance of the production Arca system, which is running a lot of the same technology we expect that in the **CCG to SDOT** phase you can expect a net latency **decrease** of approximately 30 ms. In the **CCG to NYSE DBK** phase you can expect the total end-to-end latency to be approximately less than 10 ms.

- Q5:** What are your deliverable dates for each of these phases?
- A5:** Testing for the **CCG to SDOT** phase can begin in the 3rd quarter of 2007 with production availability in the 4th quarter of 2007. Testing of the **CCG to NYSE DBK** phase should be available for testing in the beginning of 2008. When these dates become more specific this information will be made available to our customers.
- Q6:** Is there a drop-dead date for migration off CMS?
- A6:** There is no drop-dead date at this time, but we anticipate the advantages of the new architecture being so significant, that all firms will want to benefit from the migration to CCG.
- Q7:** What should be my migration path?
- A7:** Our customers should position themselves to take full advantage of the CCG service the NYSE is offering. Most of our customers have experience using the FIX protocol in conducting business with the NYSE or with other trading venues. This past experience should simplify converting your CMS application to the FIX protocol. Firms will need to code to the NYSE FIX 4.2 standard with the additional requirements that are detailed in a separate technical notification that are part of the migration to CCG. SIAC will assist you in validating your application using our automated and manual test scripts. Once testing is complete, your application will be staged for cut over on CCG.
- Q8:** How will you improve FIX latency in the **CCG to SDOT** phase?
- A8:** Within CMS, both FCS and FIX now follow similar processing paths and therefore have the same latencies. In the **CCG to SDOT** phase, CCG will have responsibility for message validation and routing directly to SDOT thereby totally bypassing the CMS application. Connecting to CCG, instead of CMS will result in a net latency reduction of approximately 30 ms.
- Q9:** Similar to FIX processing in CMS, testing with CCG relies on manual testing to validate customer application changes. What are your plans to support an automated end-to-end test tool and when?
- A9:** CCG leverages the high performance TCM messaging server developed by NYSE TransactTools used widely across the industry for high-volume, low latency electronic trading. As in other trading venues, this tool is being configured to offer a fully automated testing suite. This tool will be available for your use in the 3rd quarter of 2007.
- Q10:** I'm sold, how do I start?
- A10:** First, if you aren't already a FIX user today you'll need to get a copy of the "NYSE Euronext FIX Services Interface Specification and User Guide" manual. This document can be requested from the NYSE website: <http://www.nyse.com/content/publications/1043269645619.html>. Next, you'll need to be assigned a new firm mnemonic. If you are currently using an existing mnemonic we're asking that you use a new mnemonic specifically assigned for the purpose of migrating to FIX 4.2. If you are already a FIX 4.2 user today please call our service desk so that we can discuss your specific next steps. Once you're ready, please give us a call so that we can assist your in the migration process.

- Q11:** Once I've gone live on CCG what do I do with any open orders that were originally inputted through CMS?
- A11:** Firms have individual peculiarities surrounding how they currently connect up to CMS. When you are ready to discuss migrating to FIX 4.2, please contact your Relationship Manager so we can come up with a plan to individualize your needs.
- Q12:** Today I use FCS to send orders over a shared CMS interface to both the NYSE and the AMEX. Do I have to do anything special for the future?
- A12:** CCG is a NYSE Euronext system; please contact the AMEX directly for details of their implementation plans. The preferred method of implementation is to move your AMEX orders to another mnemonic thereby segregating your NYSE Euronext traffic. Once you have tested and cutover onto CCG, you will then be able to link your existing NYSE mnemonic to this new CCG connection.
- Q13:** Today I use CMS acknowledgements (either FCS or FIX) to measure my CMS response times. Will I be able to do the same in CCG?
- A13:** CCG offers the same functionality in responding to an order by returning a FIX acknowledgement. The difference will be in how you use and interpret this information. By comparing the CMS acknowledgement (either FCS or FIX) to the CCG FIX acknowledgement, you will always receive an order acknowledgement from CCG and that acknowledgement will be significantly faster than CMS's. If you need additional information please give us a call so we can explain this further.
- Q14:** Please explain in more detail the Drop Copy configuration changes. Why will it be necessary to have multiple CCG connections to receive our drop copy messages?
- A14:** Today, where CMS can support all of a firm's drop copy (orders, reports and admin) messages over a single connection, with CCG migration, the following configuration changes are necessary because CCG is a distributed platform:
- The Drop Copy recipient firm must have a separate Drop Copy connection for each supported firm that has migrated to CCG. This will require multiple CCG connections.
- For example, if the Drop Copy recipient firm receives drop copy messages from 10 different firms that are connected to 10 different CCG Gateways, then the Drop Copy recipient firm must have 10 separate Drop Copy connections.
- Note:** SIAC Customer Service will guide the firms and their Drop Copy configuration requirements during the CCG testing and migration phase.