NYSE EFP CROSSING SESSION 2 EXECUTION REQUEST AND DETAILS DATA FILING SPECIFICATION

Version 1.2.2

Created For:
Enterprise Services

Market Compliance Integrity and Systems (MCIS)

New York Stock Exchange
11 Wall Street
New York, NY 10005

Table of Contents

DOCUMENT CHANGE HISTORY

Date	Description	Version
04/05/2005	Creation Date	1.0
06/02/2011	Updated CS2 submission requirements	1.1
11/18/2011	Updated CS2 Requirements for NYSE Amex reporting and new field additions	1.2
01/24/2017	Minor Corrections	1.2.1
02/17/2017	Updated Manual https/sftp method and EFP Technical help desk.	1.2.2

INTRODUCTION

Firms will be required to submit both basket and stock detail information to the NYSE on T+0. Currently firms file their basket information on T+0, and then file the details for each basket on T+1 or T+2. The NYSE will now require that all this information be submitted on T+0 in a single file. The Crossing Session 2 application (CS2) will then be responsible for handling these combined submissions.

Firms will continue to be required to submit the matching DPTR data for their baskets prior to then end of the day on T+2. The current CS2 matching requirements will continue to be in place in the new system – however with the new system only the DPTR and basket data will be matched (no details matching is required).

This specification covers the new filing format for the combination of Crossing Session 2 Execution Requests and Crossing Session 2 Detail Reports to the NYSE.

With the advent of release 1.2 Market participants are now required to submit the same information for NYSE Amex listed securities than is currently required for NYSE listed securities associated with a basket. In addition, market participants must also include the execution time and price associated with each NYSE Amex transaction and identify short exempt-related trades within the basket.

DATA ENTRY OPTIONS

There are four options for reporting CS2 Data.

- Form based data entry: Form based Data Entry: Log into the EFP system and manually enter the data directly into the CS2 system via forms on the EFP web pages.
- File upload through EFP. Data Entry via FTP Transfer
- Execute an FTP transfer to send the data through the EFP secure FTP services. Data Entry via FTP Transfer
- A new web service has been created to allow firms to not only send in their data but also to receive immediate feedback as to the success or failure of that transmission and processing. Data Entry via Web Service

All four options will require the firms to enter in the stock and volume information at the time of the execution request.

For all of the file based submission options a new XML based file format has been created to accommodate the new details requirements. The existing flat-file format will not be accepted by the NYSE in the new system.

FORM BASED DATA ENTRY:

Type in below URL in IE:

1. https://ms.apps.nyse.com
2. After authentication click CrossingSessions (New),
3. Follow CS2 Plus Initial Screen for rest of the form based input.

FILE UPLOAD THROUGH EFP:

1. Click File Upload on the left panel, (if that does not work use https://mftus.nyx.com/data/cs2_in_cs2)
2. Browse and upload the file,
3. Click Upload to upload the file.

DATA ENTRY VIA SFTP/HTTPS TRANSFER (MANUAL METHOD)

In order to input CS2 data via ftp transfer, firms must use an ftp client that supports ftp-over-sftp. There are a variety of commercially available and open-source products that can be used that are compatible with these requirements. A successful connection requires we open up a firewall to allow your outgoing network that ports 443 (https) and/or 22 (sftp) to be opened from your firm's outgoing IPs must successfully authenticate to the https/sftp sites below:

https://mftus.nyx.com/data/cs2/in_cs2
https://mftusdr.nyx.com/data/cs2/in_cs2

Please use please run https://whatismyip.com from the firm IP location(s) that you are uploading CS2 files, and record the IP result(s). Typically, this is done on the CS2 User's browser that upload CS2 data. If possible have your IT Network staff look at the output IP and determine if there are more IPs address needed to help us open firewall access to our CS2 upload servers.

To obtain account information to use for authentication will be available in the CS2 web application, give updated IP address for access to our upload servers above, or can be retrieved by contacting Technical Help Desk (see below) the Only transfers of valid CS2 files (proper name, xml schema, data content) will be processed and result in data display in the CS2 web application. A successful https/sftp submittal of a data file is not adequate proof of a successful CS2 submission. If transfers is used to submit a file, the firm must proceed to the CS2 web application to confirm that the file was processed and all data was accepted.

You can call the Technical Help Desk at **212-896-2830, Option 6**.

DATA ENTRY VIA WEB SERVICE (PREFERRED METHOD)

This method is preferred because it's automated and will give back a reply if the CS2 is properly formatted and processed.

Parameters to run the WebService :

Below given are for a sample client user_id / passwords needs to be protected.

WebServiceClient <service_url> <truststore_file> <truststore_password> <userid> <password> <xml_file>

<Service URL> https://efp2.nyse.com/CS2PlusWS/services/CS2PWebService

<truststore_file> is the path to your keystore

<truststore_password> is the password for your keystore this for sample client use this from a file or code)

<password> EFP password

<xml_file> - the name of the CS2Plus XML file you want to send to the server.

<u>Generation of **<truststore_file>** and **<truststore_password>:**</u>

To get the certificate use Internet Explorer to go to
https://efp2.nyse.com/CS2PlusWS/services/CS2PWebService,
wait for the page to load, then go to the File browser menu and click Properties
item. In the popup window click Certificates button, in the new popup window
choose the Details tab, then click the Copy to File... button.
This will start the Certificate Export Wizard. Click Next, choose the
Base-64 encoded X.509 file format, and select the destination for the
exported certificate file. This file will be used in the next step.

To create a trusted keystore and to import the certificate a keytool utility
from J2SE package is used. To do that the next command has to be issued:
JAVA_HOME/bin/keytool -import -v -trustcacerts -alias <alias_server_name>
-file <server_certificate_file> -keystore <client_truststore_file>

<alias_server_name> is the label of the Certificate
<server_certificate_file> is the Certificate filename
<client_truststore_file> is the keystore filename

After issuing this command keytool asks for a password to protect the
keystore with, and for your explicit permission to trust the imported
Certificate (you have to manually type yes). The password will be used
later as one of the client arguments.

After a successful import of CS2Plus Certificate client is ready to be run.
This request will be send to the back end and out puts a response.

CS2 Validation Checks

Whenever a firm enters data into the CS2 System it is processed and analyzed against published New York Stock Exchange data quality rules. Whenever the data does not meet any one of the requirements, that data will be rejected. These rules are listed in Appendix 1 below.

The Trade Date is created by the system when the submission is received. Whenever data is received by the system the trade date will be set equal to the current system date.

Whenever a firm uploads CS2 Data XML file all of the records in the file are considered to be part of a single Execution. Therefore if any one of the baskets does not meet the NYSE data quality requirements all of the baskets in the file will be rejected. Firms must then either edit or delete the invalid basket in order for the entire request to be accepted.

Error Codes

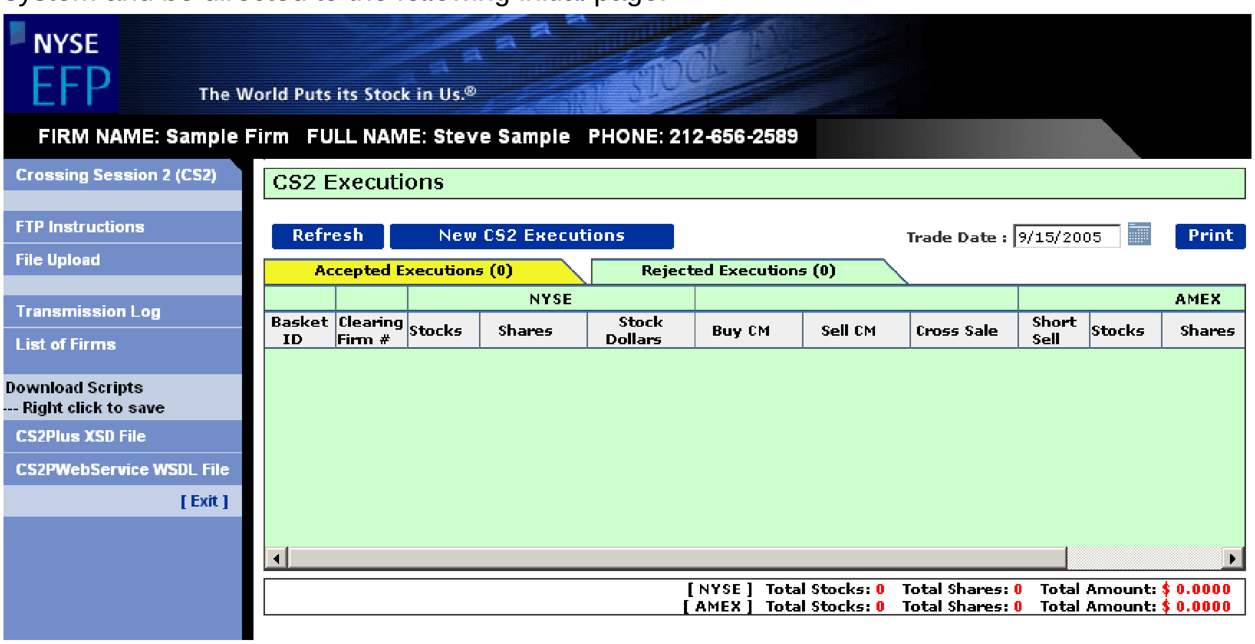
Please see Appendix 1 for the error codes will be displayed for each data quality error. Note: These error codes are only applicable for file uploads. The form based entry option will not allow a user to save edits that have invalid data.

Rejection of complete files / Records not being displayed on the Web Pages

If the system cannot read the NYSE ID field it cannot identify the source of the data, and therefore the entire file will be rejected. In this case the Execution data will not be visible on the EFP web pages.

CS2 PLUS INITIAL SCREEN

Whenever a firm chooses to enter its CS2 Data directly via the web, they will log into the EFP system and be directed to the following initial page:



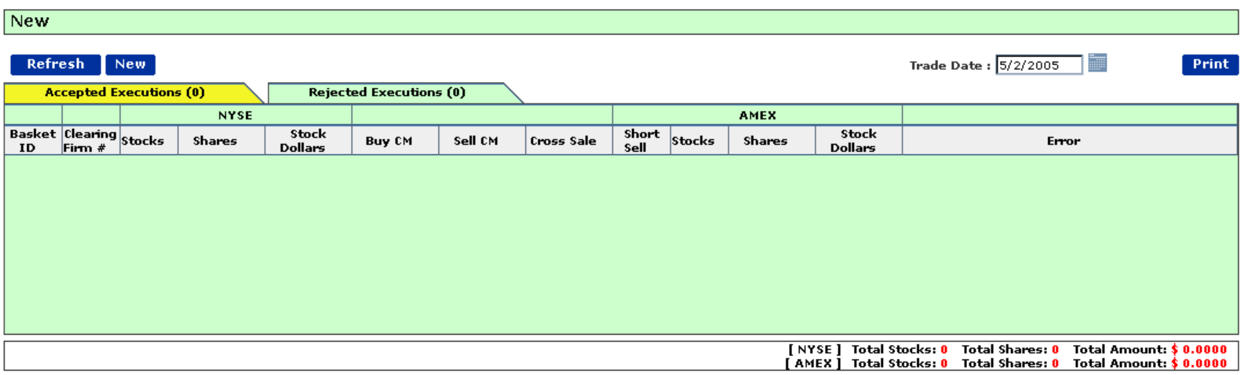
The Initial Screen allows firms to quickly verify the state of all of their Crossing Session 2 submissions. This screen is divided into two sections: Accepted Executions and Rejected Executions.

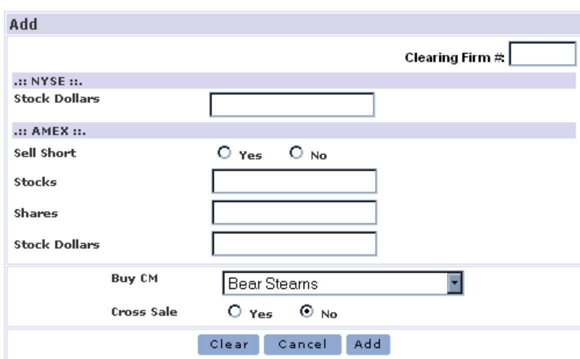
The Accepted Executions section lists the Accepted Program Trades (CS2 Executions) available in the system.

NEW EXECUTION

Whenever a firm would like to trade a basket of stocks during the Crossing Session 2 period they must first submit an Execution Request and Details to the NYSE. Previously only execution requests were reported via Crossing Sessions to the NYSE and CS2 details are reported via the DPTR system. The new CS2 system eliminates the need for two separate flat file uploads via two different systems and also provides the ability to use Web Services.

Each execution request consists of multiple baskets of stocks, each of which may contain both NYSE and AMEX stocks. Firms are allowed to enter in an NYSE basket without an AMEX basket or else both an NYSE and an AMEX basket. Firms are not allowed to enter in an AMEX basket without a corresponding NYSE basket. The web page used to manually create a new execution is shown below:





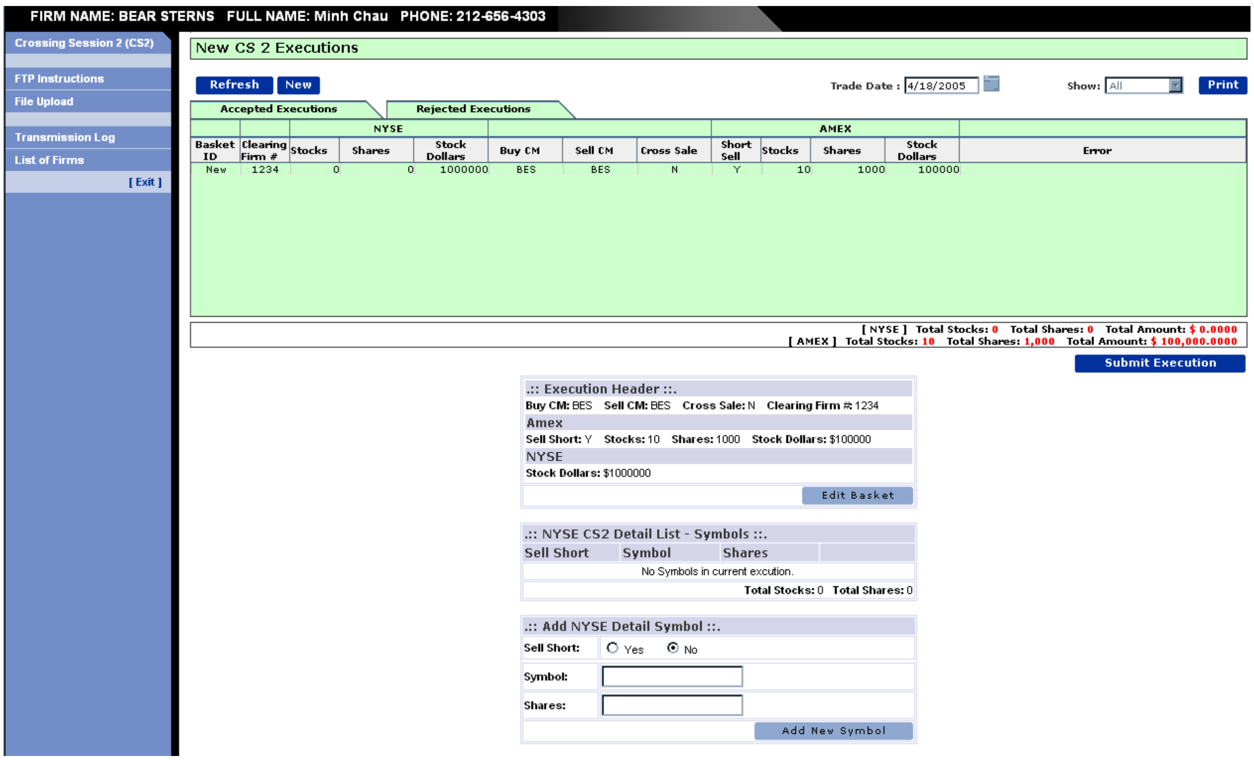
This screen will be changed to one entry for Amex stock dollars. Sell short, stocks & shares will be removed.

When creating a basket the system requires that the following data be entered into the form:

- Clearing Member Number
- NYSE Stock Dollar Value
- AMEX Stock Dollar Value
- AMEX Cross Sale Indicator
- The firm that the basket is being crossed with

In the past firms were also required to enter in the NYSE Number of Shares and the NYSE Number of Stocks, however since the user now has to enter in the individual symbols and volume these will be calculated instead.

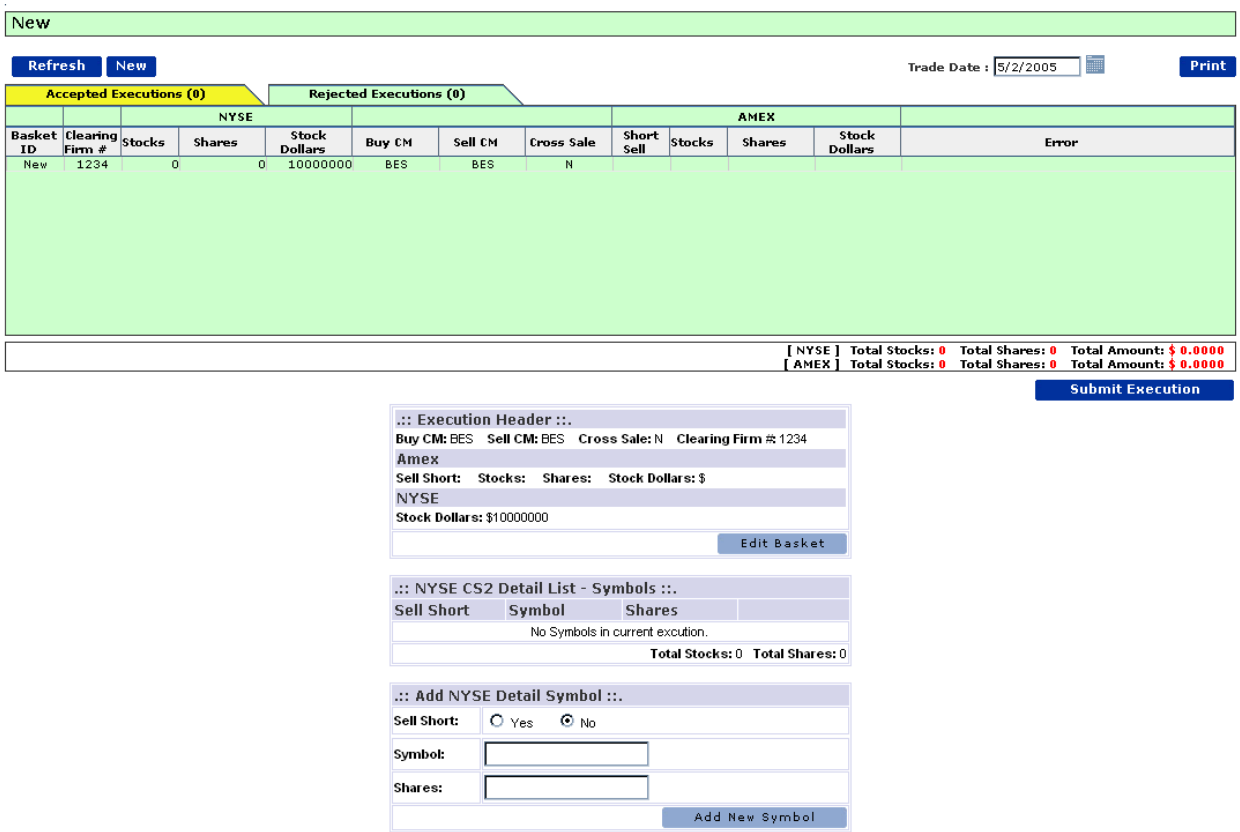
From this page the user can enter multiple baskets into the system by entering the relevant data in the form at the bottom of the page and then clicking on the **Add** button. As baskets are added to this page, they will be displayed in the top section as follows:



This screen will be changed to include a sell short exemption, price, time and Exchange indicator (whether it is an Amex or NYSE stock). Amex summary stocks & shares will be removed.

Each of the added baskets will require that the stock symbols and the volume for each symbol be entered before the baskets can be executed!

ADD CS2 DETAIL- STOCK SYMBOL AND VOLUME

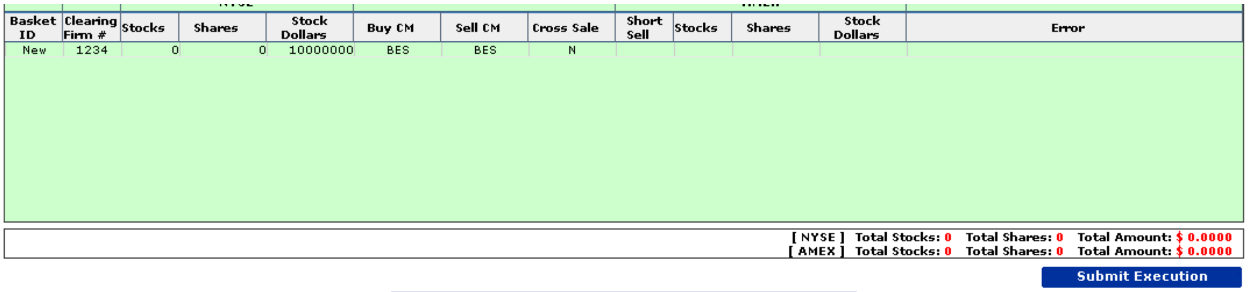


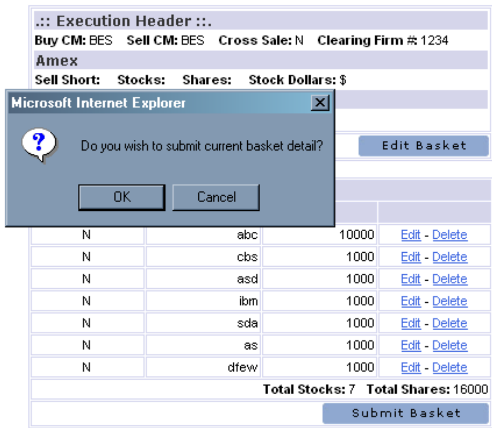
The Add CS2 Detail screen lets the firm input the Detail Data for the CS2 Execution. The top part of the page displays all of the information that has been entered for the basket, and the bottom part displays a form where firms can enter in the symbol and the number of shares of that symbol that the basket contains.

The firms will enter each symbol one by one by filling in the Symbol and Shares fields, indicate short sales using the Sell Short radio buttons, and then pressing the **Add New Symbol**. The number of symbols added and number of shares for the basket is automatically updated as the symbols are added (see below screen shot).

This screen will be changed to include a sell short exemption, price, time and Exchange indicator (whether it is an Amex or NYSE stock). Amex summary stocks & shares will be removed.

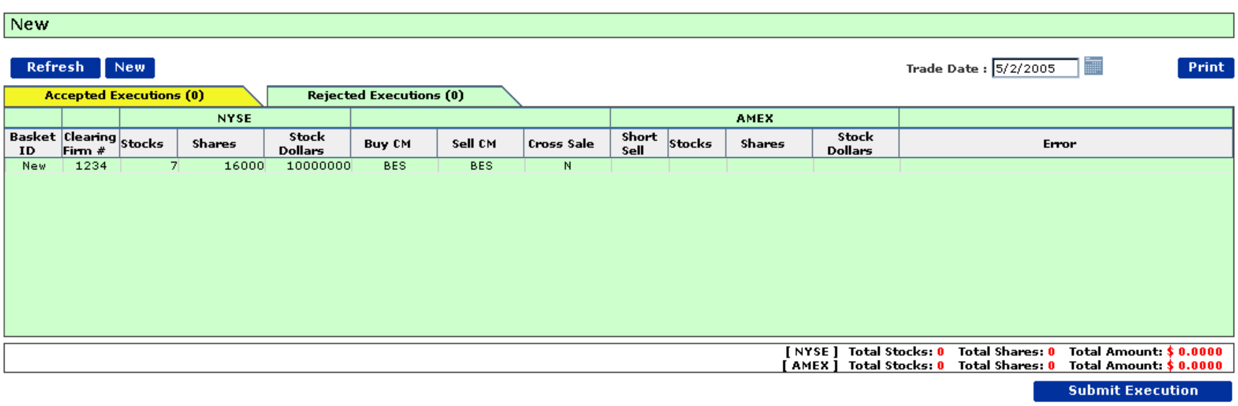
Click Submit Basket will be all the give the below screen:



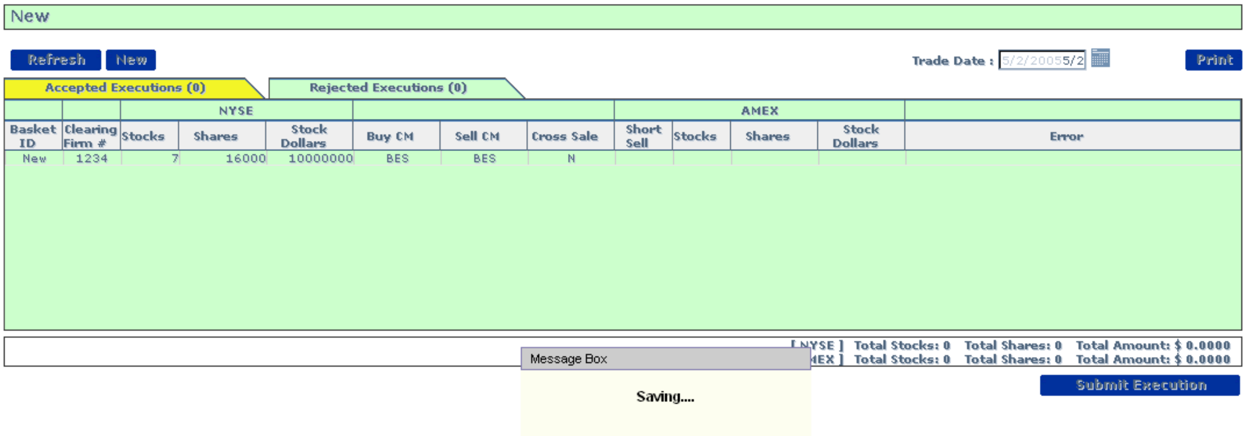


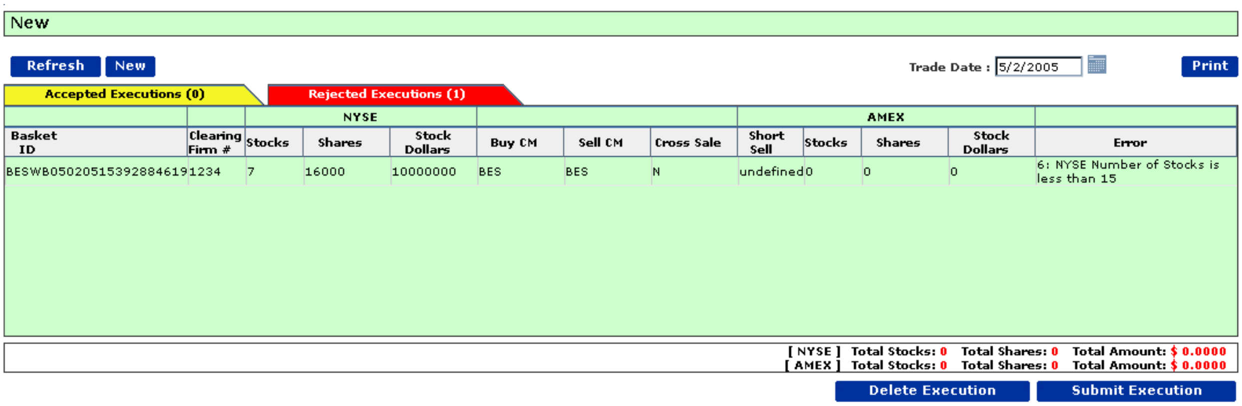
Once all the symbol and volume information has been added to each basket the system will allow the user to request execution of the request by clicking on the **Submit Execution** button. At this time the execution will be submitted to the NYSE and if it is accepted the **Accepted Executions** tab will be updated appropriately.

CS2 EXECUTIONS SUMMARY



Click Submit Execution:





APPENDIX 1:LIST OF ERROR CODES

111	Missing CS2 NyseID
112	Invalid CS2 NyseID
114	Invalid CS2 Execution Trade Date, Execution Date is not current date
115	Missing Nyse Sell Short Indicator
116	Invalid ~~Nyse~~ Sell Short Indicator
117	Missing Nyse Number of Stocks
118	Invalid or Non Numeric Nyse Number of Stocks
119	Nyse Number of Stocks Less than 15
120	Missing Nyse Number of Shares
121	Invalid or Non Numeric Nyse Number of Shares
122	Missing Nyse Stock Dollar Value
123	Invalid or Non Numeric Nyse Stock Dollar Value
~~124~~	~~Nyse Stock Dollar Value less than 1000000~~ **This validation rule has been removed as per the business's request.**
125	Missing Nyse Buy Clearing Member
~~126~~	~~Invalid or Non Existent Nyse Buy Clearing Member~~ **This validation rule has been removed as per the business's request.**
127	Missing Nyse Sell Clearing Member
~~128~~	~~Invalid or Non Existent Nyse Sell Clearing Member~~ **This validation rule has been removed as per the business's request.**
~~129~~	~~Either Buy or Sell Clearing Member should be the same as Nyse Id~~ **This validation rule has been removed as per the business's request.**
130	Missing Amex Sell Short Indicator
131	Invalid Amex Sell Short Indicator
132	Missing Amex Number of Stocks
133	Invalid or Non Numeric Amex Number of Stocks
134	Amex Number of Stocks entered without Amex Sell Short Indicator
135	Missing Amex Number of Shares
136	Invalid or Non Numeric Amex Number of Shares
137	Amex Number of Shares entered without Amex Sell Short Indicator
138	Missing Amex Stock Dollar Value
139	Invalid or Non Numeric Amex Stock Dollar Value
140	Amex Stock Dollar Value entered without Amex Sell Short Indicator

141	Contact Name not provided with the Execution
142	Contact Number not provided with the Execution
143	Execution not submitted in CS2 Execution Time
144	Cross Sale entered without Amex Sell Short Indicator
145	Invalid Cross Sale entered - should be Y or N only
~~146~~	~~Program Trades in CS2 time should contain one NYSE wave~~ **This validation rule has been removed as per the business's request.**
~~147~~	~~Program Trades in CS2 time can only contain one AMEX wave~~ **This validation rule has been removed as per the business's request.**
~~148~~	~~More than one NYSE BUY waves found for a Program Trade in CS2 Time~~ **This validation rule has been removed as per the business's request.**
~~149~~	~~More than one NYSE SELL waves found for a Program Trade in CS2 Time~~ **This validation rule has been removed as per the business's request.**
~~151~~	~~Wave duplicates existing wave of a Program Trade already accepted~~ **This validation rule has been removed as per the business's request.**
~~152~~	~~Control Numbers duplicated in the waves within Program Trade~~ **This validation rule has been removed as per the business's request.**
~~153~~	~~Invalid Wave - Has neither an Equity or a Derivative Component~~ **This validation rule has been removed as per the business's request.**
~~154~~	~~More than one AMEX BUY waves found for a Program Trade in CS2 Time~~ **This validation rule has been removed as per the business's request.**
~~155~~	~~More than one AMEX SELL waves found for a Program Trade in CS2 Time~~ **This validation rule has been removed as per the business's request.**
~~156~~	~~AMEX BUY wave submitted without supporting NYSE BUY wave for Program Trade in CS2 Time~~ **This validation rule has been removed as per the business's request.**
~~157~~	~~AMEX SELL wave submitted without supporting NYSE SELL wave for Program Trade in CS2 Time~~ **This validation rule has been removed as per the business's request.**
~~158~~	~~Total NYSE Stocks or Dollar Value too low for CS2~~ **This validation rule has been removed as per the business's request.**
~~201~~	~~Duplicate Symbols in Basket Stock~~ **This validation rule has been removed as per the business's request.**
~~204~~	~~Stock SYMBOL is not a valid symbol~~ **This validation rule has been removed as per the business's request.**
~~205~~	~~Stock SYMBOL is a halted symbol~~ **This validation rule has been removed as per the business's request.**
~~206~~	~~Stock SYMBOL exceeds the length limit in 10 characters~~ **This validation rule has been removed as per the business's request.**
~~207~~	~~Stock SYMBOL contains more than 1 period~~ **This validation rule has been removed as per the business's request.**
~~208~~	~~Halts errors~~ **This validation rule has been removed as per the business's request.**
~~209~~	~~Data warehouse symbols errors~~ **This validation rule has been removed as per the business's request.**

APPENDIX 2: XML SCHEMA FOR CS2 DATA

Schema for file uploads, ftp uploads and Web Services.

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified" attributeFormDefault="unqualified">
	<xs:element name="submission">
		<xs:annotation>
			<xs:documentation>The root element</xs:documentation>
		</xs:annotation>
		<xs:complexType>
			<xs:sequence>
				<xs:element ref="submissionHeader"/>
				<xs:element ref="basket" maxOccurs="unbounded"/>
			</xs:sequence>
			<xs:attribute name="user" type="xs:string" use="optional">
				<xs:annotation>
					<xs:documentation>This attribute is filled in
by the serverside with the remote user id that was used for
authorization.</xs:documentation>
				</xs:annotation>
			</xs:attribute>
		</xs:complexType>
	</xs:element>
	<xs:element name="basket">
		<xs:annotation>
			<xs:documentation>Basket root</xs:documentation>
		</xs:annotation>
		<xs:complexType>
			<xs:sequence>
				<xs:element ref="basketHeader"/>
				<xs:element ref="basketStock" maxOccurs="unbounded"/>
			</xs:sequence>
		</xs:complexType>
	</xs:element>
	<xs:element name="submissionHeader">
		<xs:annotation>
			<xs:documentation>Submission header</xs:documentation>
		</xs:annotation>
		<xs:complexType>
			<xs:all>
				<xs:element ref="clearingFirm"/>
			</xs:all>
		</xs:complexType>
	</xs:element>
	<xs:element name="basketHeader">
		<xs:annotation>
			<xs:documentation>Basket header</xs:documentation>
		</xs:annotation>
		<xs:complexType>
			<xs:all>
				<xs:element ref="amexIsCross"/>
				<xs:element ref="amexValueUsd"/>
				<xs:element ref="nyseValueUsd"/>
				<xs:element ref="buyFirmGroupId"/>
```

```
            </xs:all>
        </xs:complexType>
    </xs:element>
    <xs:element name="basketStock">
        <xs:annotation>
            <xs:documentation>Basket detail</xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:attribute name="exchange" use="required">
                <xs:simpleType>
                    <xs:restriction base="xs:string">
                 <xs:enumeration value="N"/>
                  <xs:enumeration value="A"/>
              </xs:restriction>
                </xs:simpleType>
            </xs:attribute>

            <xs:attribute name="symbol" use="required">
                <xs:simpleType>
                    <xs:restriction base="xs:string">
                        <xs:maxLength value="10"/>
                    </xs:restriction>
                </xs:simpleType>
            </xs:attribute>
            <xs:attribute name="shareNum" use="required">
                <xs:simpleType>
                    <xs:restriction base="xs:int">
                        <xs:minInclusive value="0"/>
                    </xs:restriction>
                </xs:simpleType>
            </xs:attribute>
            <xs:attribute name="isShort" use="required">
                <xs:simpleType>
                    <xs:restriction base="xs:string">
                 <xs:enumeration value="Y"/>
                  <xs:enumeration value="N"/>
              </xs:restriction>
                </xs:simpleType>
            </xs:attribute>
            <xs:attribute name="isShortExempt" use="required">
            <xs:simpleType>
                    <xs:restriction base="xs:string">
                 <xs:enumeration value="Y"/>
                  <xs:enumeration value="N"/>
                    </xs:restriction>
            </xs:simpleType>
            </xs:attribute>
            <xs:attribute name="price" use="required">
                <xs:simpleType>
                <xs:restriction base="xs:decimal">
                    <xs:fractionDigits value="4"/>
                </xs:restriction>
            </xs:simpleType>
        </xs:attribute>
            <xs:attribute name="time" use="required">
                <xs:simpleType>
              <xs:restriction base="xs:decimal">
                    <xs:fractionDigits value="6"/>
```

```
                        </xs:restriction>
                  </xs:simpleType>
                  </xs:attribute>
            </xs:complexType>
      </xs:element>
      <xs:element name="clearingFirm">
            <xs:annotation>
                  <xs:documentation>Clearing Firm Number </xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                  <xs:restriction base="xs:short">
                        <xs:totalDigits value="4"/>
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>
      <xs:element name="nyseValueUsd">
            <xs:annotation>
                  <xs:documentation>NYSE Stock Dollar Value of the
Basket</xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                  <xs:restriction base="xs:long">
                        <xs:minInclusive value="0"/>
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>
      <xs:element name="amexValueUsd">
            <xs:annotation>
                  <xs:documentation>AMEX Stock Dollar Value of the
Basket</xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                  <xs:restriction base="xs:long">
                        <xs:minInclusive value="0"/>
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>

      <xs:element name="buyFirmGroupId">
            <xs:annotation>
                  <xs:documentation>Buying firm identifier used by the
PROVASS systems</xs:documentation>
            </xs:annotation>
            <xs:simpleType>
                  <xs:restriction base="xs:string">
                        <xs:minLength value="1"/>
                  </xs:restriction>
            </xs:simpleType>
      </xs:element>
      <xs:element name="amexIsCross" type="yesNo">
            <xs:annotation>
                  <xs:documentation>AMEX Cross Sale
Indicator</xs:documentation>
            </xs:annotation>
      </xs:element>
      <xs:simpleType name="yesNo">
            <xs:restriction base="xs:string">
                  <xs:enumeration value="Y"/>
```

```
                    <xs:enumeration value="N"/>
                </xs:restriction>
            </xs:simpleType>
</xs:schema>
```

APPENDIX 3: WSDL

WSDL for Web Service:

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions targetNamespace="http://ws.cs2plus.nyse.com"
xmlns:impl="http://ws.cs2plus.nyse.com" xmlns:intf="http://ws.cs2plus.nyse.com"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsdlsoap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
 <wsdl:types>
  <schema elementFormDefault="qualified" targetNamespace="http://ws.cs2plus.nyse.com"
xmlns="http://www.w3.org/2001/XMLSchema" xmlns:impl="http://ws.cs2plus.nyse.com"
xmlns:intf="http://ws.cs2plus.nyse.com" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
   <element name="sendXml">
    <complexType>
     <sequence>
      <element name="xml" nillable="true" type="xsd:string"/>
     </sequence>
    </complexType>
   </element>
   <element name="sendXmlResponse">
    <complexType>
     <sequence>
      <element name="sendXmlReturn" nillable="true" type="xsd:string"/>
     </sequence>
    </complexType>
   </element>
  </schema>
 </wsdl:types>

   <wsdl:message name="sendXmlRequest">

      <wsdl:part element="intf:sendXml" name="parameters"/>

   </wsdl:message>

   <wsdl:message name="sendXmlResponse">

      <wsdl:part element="intf:sendXmlResponse" name="parameters"/>

   </wsdl:message>

   <wsdl:portType name="CS2PWebService">

      <wsdl:operation name="sendXml">

         <wsdl:input message="intf:sendXmlRequest" name="sendXmlRequest"/>

         <wsdl:output message="intf:sendXmlResponse" name="sendXmlResponse"/>

      </wsdl:operation>

   </wsdl:portType>

   <wsdl:binding name="CS2PWebServiceSoapBinding" type="intf:CS2PWebService">
```

```
      <wsdlsoap:binding style="document"
transport="http://schemas.xmlsoap.org/soap/http"/>

      <wsdl:operation name="sendXml">

         <wsdlsoap:operation soapAction=""/>

         <wsdl:input name="sendXmlRequest">

            <wsdlsoap:body use="literal"/>

         </wsdl:input>

         <wsdl:output name="sendXmlResponse">

            <wsdlsoap:body use="literal"/>

         </wsdl:output>

      </wsdl:operation>

   </wsdl:binding>

   <wsdl:service name="CS2PWebServiceService">

      <wsdl:port binding="intf:CS2PWebServiceSoapBinding" name="CS2PWebService">

         <wsdlsoap:address
location="https://efp2.nyse.com/CS2PlusWS/services/CS2PWebService"/>

      </wsdl:port>

   </wsdl:service>

</wsdl:definitions>
```

APPENDIX 4: CS2 DATA SAMPLE FILE

```
<submission>
  <submissionHeader>
    <clearingFirm>2234</clearingFirm>
  </submissionHeader>
  <basket>
    <basketHeader>
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APPENDIX 5: CS2 EXECUTION SPECS FOR COMBINING BUYS AND SELLS:

combine like names across buys and sells for reporting

Buy 1000 IBM, Sell 200 IBM
Buy 1000 JNJ, Sell 5000 JNJ

Aggregate CS2 submission: like
IBM 800
JNJ 4000

<u>DPTR Submission will be</u>
The basket will contain 2 stocks - IBM and JNJ
The total shares in the basket will be (1000 - 200 = 800 IBM) + (5000 - 1000 = 4000) JNJ
Two waves should be filed - a buy wave with one stock (IBM = 800 shares) and a sell wave with one stock (JNJ = 4000 shares).