



SECURITIES INDUSTRY AUTOMATION CORPORATION

CQS

**CONSOLIDATED QUOTATION SYSTEM
MULTICAST OUTPUT BINARY SPECIFICATION**

**February 14, 2018
Version 1.6**

CONSOLIDATED QUOTATION SYSTEM (CQS)
MULTICAST OUTPUT BINARY SPECIFICATION

CONTENTS

VERSION HISTORY	4
1.0 INTRODUCTION	6
1.1 BACKGROUND	6
1.2 DUAL SITE REDUNDANCY	6
1.3 SCOPE.....	7
1.4 DATA FEED REFERENCE MATERIAL	7
2.0 GENERAL DESIGN OF DATA DISTRIBUTION NETWORK.....	8
3.0 TRANSMISSION CHARACTERISTICS.....	9
3.1 TRANSMISSION BLOCK	9
3.2 BLOCK DATA	9
3.3 BLOCK PAD BYTE	9
3.4 DATA TYPE	10
3.4.1 Numeric Types	10
3.4.2 Alpha/Alphanumeric/Special/Printable Types.....	10
3.5 BLOCK HEADER	11
3.5.1 Version	11
3.5.2 Block Size.....	11
3.5.3 Block Sequence Number	12
3.5.4 Messages in Block	12
3.5.5 Block Checksum.....	12
3.5.6 Data Feed Indicator	12
3.5.7 Retransmission Indicator	13
3.5.8 SIP Block Timestamp	13
3.6 RETRANSMISSION CAPABILITY	14
4.0 MESSAGE HEADER.....	15
4.1 MESSAGE LENGTH	15
4.2 MESSAGE CATEGORY AND MESSAGE TYPE TABLE	16
4.2.1 Message Category.....	17
4.2.2 Message Type	17
4.3 Participant ID.....	17
4.4 Timestamp 1	18
4.5 Participant Reference Number	18
4.6 Message ID	18
4.7 Transaction ID	18
5.0 MESSAGE ROUTING.....	19
6.0 MESSAGE FORMATS.....	21
6.1 ADMINISTRATIVE UNFORMATTED (FREE FORM TEXT) MESSAGES – CATEGORY A	22
6.1.1 Administrative Unformatted (free form text) – Category A Type H	22
6.2 CONTROL MESSAGES – CATEGORY C.....	23
6.2.1 Start of Day – Category C Type A	23
6.2.2 FINRA Close – Category C Type C	23
6.2.3 Reset Message Sequence Number – Category C Type L	23
6.2.4 Start of Test Cycle – Category C Type M	23
6.2.5 End of Test Cycle – Category C Type N	24
6.2.6 FINRA Open – Category C Type O	24
6.2.7 Disaster Recovery Data Center Activation – Category C Type P	24
6.2.8 Line Integrity – Category C Type T	24
6.2.9 End of Day – Category C Type Z.....	25
6.3 MARKET STATUS MESSAGES – CATEGORY M.....	26
6.3.1 Market-Wide Circuit Breaker Decline Level Status – Category M Type K	26

CONSOLIDATED QUOTATION SYSTEM (CQS)
MULTICAST OUTPUT BINARY SPECIFICATION

6.3.2	Market-Wide Circuit Breaker Status – Category M Type L.....	27
6.4	QUOTE MESSAGES – CATEGORY Q	28
6.4.1	Auction Status – Category Q Type A	28
6.4.2	Long Quote – Category Q Type L.....	29
6.4.3	Short Quote – Category Q Type Q	30
6.4.4	Special Long Quote (FINRA ADF) with FINRA BBO Information – Category Q Type S	31
6.4.5	National Best Bid Short Appendage and National Best Offer Short Appendage	33
6.4.6	National Best Bid Long Appendage and National Best Offer Long Appendage	34
7.0	FIELD DESCRIPTIONS	35
APPENDIX A: CQS CONFIGURATION		61
APPENDIX B: GLOSSARY.....		62
APPENDIX C: SUMMARY OF DAILY CQS MULTICAST LINE MESSAGES		66
APPENDIX D: ADMINISTRATIVE MESSAGE TEXT SAMPLES		69
APPENDIX E: CQS CLOSING ROUTINE		70
APPENDIX F: NATIONAL BEST BID AND OFFER OVERVIEW		71
APPENDIX G: QUOTE CONDITIONS.....		73
APPENDIX H: SECURITY STATUS INDICATORS.....		76
APPENDIX I: SYMBOL SUFFIXES EXAMPLES		78
APPENDIX J: ASCII PRINTABLE TABLE (CHARACTER CODE 32-126)		80
CQS MULTICAST OUTPUT BINARY AND ASCII PROTOCOL DIFFERENCES AND NOTES		81

CONSOLIDATED QUOTATION SYSTEM (CQS)
MULTICAST OUTPUT BINARY SPECIFICATION

VERSION HISTORY

Version	Date	Description
1.0	July 1, 2016	Initial Document
1.1	September 15, 2016	<ul style="list-style-type: none">▪ Added: New Dedicated Test Symbols.
1.2	February 21, 2017	<p><u>Added:</u></p> <ul style="list-style-type: none">▪ ‘Message Length’ field in Message Header and field description.▪ New ‘Auction Status Category Q Type A’ message and field descriptions. <p><u>Corrected:</u></p> <ul style="list-style-type: none">▪ ‘Start of Day Category C Type A’ message typo to reflect ‘Category C Type N’ End of Test Cycle in Block Sequence Number field description.▪ ‘Start of Day Category C Type A’ typo message typo to Category ‘C’ in Start of Test Cycle/End of Test Cycle field descriptions.▪ Description for the transmission at 20:06 to be identified as ‘End of Day’. <p><u>Eliminated:</u></p> <ul style="list-style-type: none">▪ Administrative Message ‘Text Length’ field (Length is identified in Message Header).▪ ‘Temporary Suffix’ field/descriptions which are no longer supported. <p><u>Modified:</u></p> <ul style="list-style-type: none">▪ ‘Block Pad Byte’ description to include binary representation.▪ Order of field appearances in Block Header and Message Header.▪ ‘National BBO Indicator’ field moved from Message Header to Quote Message formats.▪ Message Header ‘Transaction ID’ field Data Type.▪ Message routing reverted to current Production routing.▪ MWCB Level 1, 2 and 3 Data Type representations.▪ Data Type useable ‘signed integer’ values.▪ Clarification on appearance of Bid /Offer Appendages following message formats.▪ Retransmission code from ‘R’ back to ‘V’ to indicate Retransmission.▪ Minor edits/clarification throughout document/removed verbiage associated with eliminated functionality.▪ Binary and ASCII Protocol Differences and Notes.
1.3	May 5, 2017	<p><u>Added:</u></p> <ul style="list-style-type: none">▪ CBOE Stock Exchange, Inc. (CBSX) Participant ID ‘W’ <p><u>Corrected:</u></p> <ul style="list-style-type: none">▪ MWCB Levels implied decimal typo to be implied 6 decimals
1.4	June 2, 2017	<p><u>Added:</u></p> <ul style="list-style-type: none">▪ New Dedicated Test Symbols: ZIEXT, ZEXIT & ZXIET <p><u>Corrected:</u></p> <ul style="list-style-type: none">▪ From: Reset Message Sequence Number / To: Reset Block Sequence Number

CONSOLIDATED QUOTATION SYSTEM (CQS)
MULTICAST OUTPUT BINARY SPECIFICATION

VERSION HISTORY

Version	Date	Description
1.5	August 28, 2017	<u>Modified:</u> <ul style="list-style-type: none">▪ Use of only a subset of new National Best Bid and Offer (NBBO) Indicator Codes 'A, G, O, T, and U' upon Binary implementation for a transitional period (complete set of codes to be used at a future date)▪ Block Sequence Number rollover limited to occur after 999,999,999 (instead of 3,999,999,999) for a transitional period▪ From: NYSE MKT / To: NYSE American
1.6	February 14, 2018	<u>Modified:</u> <ul style="list-style-type: none">▪ From: National Stock Exchange / To: NYSE National, Inc.▪ From: Bats EDGA Exchange / To: Cboe EDGA Exchange▪ From: Bats EDGX Exchange / To: Cboe EDGX Exchange▪ From: Bats BYX Exchange / To: Cboe BYX Exchange▪ From: Bats BZX Exchange / To: Cboe BZX Exchange▪ IEX status to Primary Listing Exchange▪ Security Status Indicator value 'X' From: Equipment Changeover / To: Operational▪ Description of Auction Status message

1.0 INTRODUCTION

The Securities Industry Automation Corporation (SIAC) serves as the Processor for the Consolidated Quote Plan from its inception on August 1, 1978. In fulfilling its role as the Processor, SIAC plans, develops, operates, and maintains the Consolidated Quotation System (CQS).

1.1 Background

CQS receives transactions generated by participating U.S. Stock Exchanges and the Financial Industry Regulatory Authority (FINRA). In addition, CQS calculates the National ‘Best Bid and Best Offer’ (NBBO) and identifies the FINRA ‘Best Bid and Best Offer’ (FBBO). CQS consolidates transactions that occurred on participating U.S. Stock Exchanges and FINRA and disseminates this information via computer-to-computer linkages to the financial community in the U.S. and abroad.

Essential in ensuring the timely reporting of quote information are the CQS IP Multicast data streams. CQS has a unique set of IP Multicast addresses assigned to each of its data “lines”. Data generated by each participating Exchange and FINRA is assembled in prescribed message formats and transmitted to the appropriate TCP/IP Processor address via the Participants’ private communications facility. As each message is received, it is merged with messages received from all Participants, and the consolidated message stream is transmitted simultaneously to all Data Recipients via their private communications facilities. Approved Data Recipients of the CQS service can redistribute CQS data worldwide to their customers as part of their individual services or use the data for their own purposes.

Note:

- It is recommended that Data Recipients subscribe to both the Consolidated Quotation System (CQS) and the Consolidated Tape System (CTS) in order to receive complete listed equity market data. Reference the CQS and CTS Specifications for further details at: www.ctaplan.com.

1.2 Dual Site Redundancy

Computer systems that support the processing and dissemination of quote transactions are operational at primary and backup sites. The backup site provides recovery capability in the event of a disaster at the primary site. Through computerized communications equipment, CQS transaction data is disseminated from either the primary or backup site. The dual-site configuration provides system fold-over for a limited site disaster (system failure) or full site disaster (loss of facility).

In the event of a Primary Data Center failover to the Disaster Recovery site (Backup Data Center), data will be sourced via the Backup Data Center source addresses.

1.3 Scope

This specification defines the interface and message format requirements for recipients of the CQS data feed via connectivity to the National Market System (NMS) IP Multicast distribution network.

1.4 Data Feed Reference Material

Technical Specifications

For Technical Specifications visit www.ctaplan.com - and select Tech Specs tab for the following:

- CQS Multicast Output Specification
- CTS Multicast Output Specification
- Common IP Multicast Distribution Network Specification
- Automated Retransmission Facility User Guide

Consolidated Tape Association (CTA) Announcements

CTA Announcements including feed enhancements, traffic rates, etc. visit www.ctaplan.com

Future Data Feed Enhancements

Future enhancements and/or modifications may require system changes for your firm. Please refer to the CTA Plan website www.ctaplan.com to obtain the latest CTA Notifications and Technical Specification documents. **To automatically receive these Notifications and System Alerts, subscribe at: <https://www.ctaplan.com/subscribe>**

Data Feed Related Resources

For customers selecting to initiate Secure Financial Transaction Infrastructure (SFTI) connections to CQS:

- Submit a request at: <http://www.nyxdata.com/Connectivity>
- Contact SFTI Sales at: Sales-SFTI@theice.com
- For supporting SFTI® documentation including Customer and Technical guides visit www.nyxdata.com/docs

2.0 GENERAL DESIGN OF DATA DISTRIBUTION NETWORK

The NMS IP Multicast distribution network disseminates all market data and Time Beacon information in the form of multicast addressed IP datagrams.

Data available via the NMS IP Multicast distribution network includes:

CQS Real-Time Production Data

A copy of each CQS real-time production message is available from SIAC's production/primary site. These redundant copies are delivered via two distinct multicast data streams.

CQS Real-Time Retransmission Data

The retransmission data streams are available from SIAC's production/primary site, but are not delivered via redundant data streams.

CQS After-Hours Playback Data

There are two sets of IP Multicast data feeds dedicated for after-hours playback test data. One set of IP Multicast data feeds supports the playback of production messages and the other set supports the playback of test messages. This playback data is made available via a single set of multicast data feeds.

Time Beacon

Selected nodes that source multicast data within the NMS IP Multicast distribution network generate a single Time Beacon packet every six seconds. Each node will issue a Time Beacon packet to the same multicast group.

IP Multicast Network Interface

The requirements for the NMS IP Multicast distribution network interface are defined in the document, 'Common IP Multicast Distribution Network Recipient Interface Specification' which can be accessed at website: <http://www.ctaplan.com> and select the Tech Specs tab.

3.0 TRANSMISSION CHARACTERISTICS

3.1 Transmission Block

Encapsulated within each IP packet is a single transmission Block. One type of transmission Block is used for all types of messages. A Block can have a maximum of 1,000 bytes inclusive of Block Header, Block Data, and Block Pad Byte.

Block Structure	Length
Block Header	20
Block Data	Variable
Block Pad Byte (optional)	1

3.2 Block Data

The Block Data consists of one or more CQS messages.

A message consists of a Message Header, which is of fixed length and format and Message Data (Body), which is variable in length and format. Category C – Control messages are each sent in their own individual block.

The Block Data structure is as follows:

Block Data Structure
Message 1 Data
Message 2 Data
~~~
Message N Data

#### 3.3 Block Pad Byte

**Byte.** Unsigned integer contains binary zero (Hex 0x00). Only used when the size of a block consists of an odd number of bytes. In instances of odd number of bytes, the Block Pad Byte is added to the Block to ensure the Block is an even number of bytes.

### 3.4 Data Type

The following data types are used by CQS:

Type	Value
<b>NUMERIC – Big-Endian (Network Byte Order)</b>	
byte	Big-Endian Unsigned 1 Byte Integer
short	Big-Endian Unsigned 2 Byte Integer
integer	Big-Endian Unsigned 4 Byte Integer
long	Big-Endian Unsigned 8 Byte Integer
<b>ALPHA/ALPHANUMERIC/SPECIAL/PRINTABLE</b>	
char	Single printable ASCII character
char[ ]	Fixed length printable ASCII characters
varchar [ ]	Variable lengths printable ASCII characters

#### 3.4.1 Numeric Types

1. All numeric fields will be in Big-Endian (Network Byte Order) format
2. Numeric types (byte, short, integer and long) represent sequence numbers, timestamps, prices and sizes
3. Prices represented by short fields have implied 2 decimal places
4. Prices represented by long fields have implied 6 decimal places
5. Any numeric value that is unused or does not apply to a given message type has a value set to 0

The maximum range values for the numeric fields are as follows:

1 byte unsigned integer: 0 – 255 (byte)  
2 byte unsigned integer: 0 – 65,535 (short)  
4 byte unsigned integer: 0 – 4,294,967,295 (integer)  
8 byte unsigned integer: 0 – 18,446,744,073,709,551,615 (long)

Select values represented as 2's complement, will have signed integers with the following range:

8 byte signed integer: -9,223,372,036,854,775,808 to +9,223,372,036,854,775,807  
(signed long)

#### 3.4.2 Alpha/Alphanumeric/Special/Printable Types

1. ASCII printable character codes 32 – 126
2. Left justified and padded on the right with spaces for fixed length fields

### 3.5 Block Header

Field	Length	Type
Version	1	Byte
Block Size	2	Short
Data Feed Indicator	1	Char
Retransmission Indicator	1	Char
Block Sequence Number	4	Integer
Messages In Block	1	Byte
SIP Block Timestamp	8	2 x Integer
Block Checksum	2	Short
<b>Total Length</b>	<b>20</b>	

#### 3.5.1 Version

**Byte.** Indicates the CQS binary protocol version and allows for Block Header, Message Header and Message formats to be updated while still supporting previous versions of headers/message formats during transition. Version value is set to 0 for first/initial version.

#### 3.5.2 Block Size

**Short.** Indicate size in bytes of the entire transmission block.

### 3.5.3 Block Sequence Number

**Integer.** All transmission blocks are assigned a sequential Block Sequence Number. Rollover occurs after 999,999,999 (a future enhancement will increase the number to 3,999,999,999). On a per multicast line basis, the Block Sequence Number on the multicast lines are set to zero at the start of each day, and incremented by one each time a block is transmitted, with the following exceptions:

1. Retransmitted blocks contain the Block Sequence Number of the original block.
2. The Block Sequence Number field in the Block Header of a Category C Type L (Reset **Block** Sequence Number) contains the number to which the Block Sequence Number counter is to be reset. This number is either one (1) in the event the sequence numbers rolls over from 999,999,999 (a future enhancement will increase the number to 3,999,999,999) or a number greater than the highest number previously transmitted.
3. The block containing Category C Type A (Start of Day) message has a Block Sequence Number set to zero.
4. The block containing Category C Type T (Line Integrity) message contains the block sequence number of the last block transmitted, which was not a retransmitted block.
5. The block containing Category C Type A (Start of Day) and Category C Type Z (End of Day) which is transmitted three times to ensure positive recognition, contain the same block sequence number in each iteration of the message, one higher than the last non-retransmission message.
6. The block containing Category C Type M (Start of Test Cycle) and Category C Type N (End of Test Cycle) messages has a Block Sequence Number that repeats every cycle.
7. Should CQS experience a line failure and recovery, the block sequence number for the recovered multicast line(s) is reset to a number greater than the last number transmitted and message transmission is resumed.

### 3.5.4 Messages in Block

**Byte.** The number of messages contained in the transmission block.

### 3.5.5 Block Checksum

**Short.** Lower 2 bytes of the 4 byte sum of all the bytes in the block, excluding this Block Checksum field.

### 3.5.6 Data Feed Indicator

**Char.** Value is 'Q' for Consolidated Quotation System (CQS).

### 3.5.7 Retransmission Indicator

**Char.** Contains either a 'O' (indicating an original message) or 'V' (indicating a retransmitted block).

### 3.5.8 SIP Block Timestamp

**2 x Integer (pair of integers).** Contains the block timestamp and is the SIP time that processing a block of messages is completed. The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315).

Precision Time Protocol (PTP) is utilized to provide a standard method to synchronize devices on a network with sub-microsecond precision. The protocol synchronizes slave clocks to a master clock ensuring that events and timestamps in all devices use the same time base.

SIAC recommends to represent this time in HH:MM:SS.mmmμμμnnn format Eastern Time (ET) when communicating with SIAC.

For Retransmissions, the SIP Block Timestamp will contain the original time of the Block that was transmitted.

### 3.6 Retransmission Capability

CQS safe-stores all blocks transmitted to the Data Recipients for a single trading day. This safe-store provides a facility for block retransmissions.

If Data Recipients do not receive a block(s), a retransmission of a block(s) can be requested. Retransmission requests are accepted in the period following transmission of the Start of Day message and before the transmission of the End of Day message.

The following Message Category and Types are not included in retransmissions:

Message Category	Message Type	Description
C	M	Start of Test Cycle
C	N	End of Test Cycle
C	A	Start of Day
C	T	Line Integrity
Cycles of test messages are <u>not</u> available for retransmissions.		

The Automated Retransmission Facility is utilized for automatically receiving and processing CQS block retransmission requests.

The Automated Retransmission Facility works in conjunction with the Retransmission and Playback System (RAPS), a server associated with CQS, which supports CQS retransmissions. In addition, RAPS provides data playback capability facilitating test requirements.

A Data Recipient may request automated retransmission(s) by connecting directly through SFTI to the Automated Retransmission Facility via TCP/IP addresses and ports. A Data Recipient is required to enter their assigned user ID and password along with system, line, and sequence number information. The request will be forwarded to the Automated Retransmission Facility, then to a RAPS server associated with the CQS host, and out to the proper IP multicast groups. An **‘Automated Retransmission Facility User Guide’** for automated retransmission requests can be accessed at the following website: <http://www.ctaplan.com> and select the Technical Specs tab.

All retransmitted CQS blocks contain only ‘V’ in the Retransmission Indicator field of the Block Header.

The Block Sequence Number field in the Block Header of each block retransmitted contains the original block sequence number.

Retransmissions requested by a Data Recipient will be retransmitted over dedicated retransmission multicast streams. Retransmissions generated by CQS will be retransmitted over the production multicast streams. Retransmissions are sent at a lower message rate in order not to delay transmission of current blocks. Retransmitted blocks are not combined with original messages in the same block.

**Note:**

- It is the responsibility of the Data Recipient to ignore retransmitted blocks not requested by them.

## 4.0 MESSAGE HEADER

The Message Header uniquely identifies the Category and Type of each message within a Block. The Message Header can represent an entire message or appears before the Message Body segment in each message transmitted. The Message Header contains the following bytes and conforms in all cases to the following data fields:

Field	Length	Type
Message Length	2	Short
Message Category	1	Char
Message Type	1	Char
Participant ID	1	Char
Timestamp 1	8	2 x Integer
Message ID	1	Byte
Transaction ID	4	Integer
Participant Reference Number	8	Signed Long
<b>Total Length</b>	<b>26</b>	

### 4.1 Message Length

**Short.** The Message Length identifies the total message length inclusive of the Message Header and Message Body.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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#### 4.2 Message Category and Message Type Table

Message Category	Message Type	Value
<b>Administrative</b>		
A	H	Administrative Unformatted (free form text)
<b>Control</b>		
C	A	Start of Day
C	C	FINRA Close
C	L	Reset Block Sequence Number
C	M	Start of Test Cycle
C	N	End of Test Cycle
C	O	FINRA Open
C	P	Disaster Recovery Data Center Activation
C	T	Line Integrity
C	Z	End of Day
<b>Market Status</b>		
M	K	Market-Wide Circuit Breaker Decline Level Status
M	L	Market-Wide Circuit Breaker Status
<b>Quote</b>		
Q	A	Auction Status
Q	L	Long Quote
Q	Q	Short Quote
Q	S	Special Long Quote (FINRA ADF) with FBBO Information



#### 4.2.1 Message Category

**Char.** The Message Category represents the message classification. Refer to Message Category and Message Type Table *section 4.2*.

#### 4.2.2 Message Type

**Char.** The Message Type together with the Message Category identifies the message. Refer to Message Category and Message Type Table *section 4.2*.

#### 4.3 Participant ID

**Char.** Participant ID identifies the Participant or Processor that generated the message.

Code	Value
A	NYSE American, LLC (NYSE American)
B	NASDAQ OMX BX, Inc. (NASDAQ OMX BX)
C	NYSE National, Inc. (NYSE National)
D	Financial Industry Regulatory Authority, Inc. (FINRA)
I	International Securities Exchange, LLC (ISE)
J	Cboe EDGA Exchange, Inc. (Cboe EDGA)
K	Cboe EDGX Exchange, Inc. (Cboe EDGX)
M	Chicago Stock Exchange, Inc. (CHX)
N	New York Stock Exchange, LLC (NYSE)
P	NYSE Arca, Inc. (NYSE Arca)
S	Consolidated Quotation System
T	NASDAQ Stock Market, LLC (NASDAQ)
V	Investors' Exchange, LLC. (IEX)
W	CBOE Stock Exchange, Inc. (CBSX)
X	NASDAQ OMX PSX, Inc. (NASDAQ OMX PSX)
Y	Cboe BYX Exchange, Inc. (Cboe BYX)
Z	Cboe BZX Exchange, Inc. (Cboe BZX)

#### 4.4 Timestamp 1

**2 x Integer (pair of integers).** Timestamp 1 is a Participant-provided timestamp. The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315). If Timestamp 1 is not provided, this field is set to zero. For any messages generated by CQS, e.g., Messages generated on behalf of a Participant, Price Band messages, Administrative messages, Control messages and Market Status messages, the Timestamp 1 field will be set to zero.

- **If from an Exchange: Timestamp 1** denotes the time where the quote bid price and/or the offer price for a security is designated with an Exchange's Matching Engine Publication timestamp. Exchanges use a clock sync methodology ensuring that timestamps are accurate within tolerances of 100 microseconds or less. Exchanges shall provide the timestamp in terms of nanoseconds since Epoch.
- **If from the FINRA Alternative Display Facility (ADF): Timestamp 1** denotes the time of the quote bid price and/or the offer price for a security that a FINRA member reports to the FINRA Alternative Display Facility. FINRA shall provide such times to the Processor in nanoseconds since Epoch.

#### 4.5 Participant Reference Number

**Signed Long.** Set to Zero. Participant Reference Number is a pass-thru of the inbound Participant Reference number assigned to a transaction. Zero, positive and negative Participant Reference Numbers will be sent.

#### 4.6 Message ID

**Byte.** The Message ID identifies the individual message within the block beginning with number one (1).

#### 4.7 Transaction ID

**Integer.** The Transaction ID will be populated by CQS and is Reserved for Internal Use only.

**Note:**

- Data Recipients should ignore/disregard this field to the extent that it does not impact their normal data processing.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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## 5.0 MESSAGE ROUTING

In total, CQS messages are disseminated over **twenty-four (24)** IP multicast lines designated as:

1. Line 1 (**L1**) through Line 12 (**L12**) for Network 'A', (NYSE listed securities)
2. Line 1 (**L1**) through Line 12 (**L12**) for Network 'B' (Cboe BZX, IEX, NYSE ARCA and NYSE American listed securities)'.

Note: The 'Primary Listing Market Participant ID' field will explicitly identify the Listing Market associated with their listed security.

Messages will be routed over the twenty-four IP multicast lines according to the network and security symbol range distribution except the following:

1. Administrative Unformatted (free form text) from NYSE are distributed over Network 'A' L1 only.
2. Administrative Unformatted (free form text) from Participants other than NYSE are distributed over Network 'B' L1 only.
3. Bond transactions are distributed over Network 'B' L1-L12.
4. Local Issues transactions are distributed over Network 'B' L1-L12.
5. Control Category 'C' messages are distributed over all Network 'A' and Network 'B' inclusive of Index lines.

Traffic for CQS Network 'A' and Network 'B' messages will be routed by network and security symbol to twenty-four (24) assigned multicast lines as follows:

CQS NETWORK 'A' Symbol Range Distribution			CQS NETWORK 'B' Symbol Range Distribution		
Multicast Lines	From	To	Multicast Lines	From	To
1	A	ANZZZZ	1	A	DZZZZZ
2	AO	BXZZZZ	2	E	EWZZZZ
3	BY	CRZZZZ	3	EX	GZZZZZ
4	CS	ELZZZZ	4	H	IWEZZZ
5	EM	GLZZZZ	5	IWF	KZZZZZ
6	GM	IQZZZZ	6	KJ	RMZZZZ
7	IR	LVZZZZ	7	RN	SKZZZZ
8	LW	NOZZZZ	8	SL	SPZZZZ
9	NP	PRZZZZ	9	SQ	UMZZZZ
10	PS	STZZZZ	10	UN	VNZZZZ
11	SU	USZZZZ	11	VO	XLEZZZ
12	UT	ZZZZZZ	12	XLF	ZZZZZZ

**Message Routing:** *continued*

**Test Messages:**

- CQS messages containing dedicated ‘Test Symbols’ for Listing Exchange NYSE will route to multicast lines for Network ‘A’ according to the network and security symbol range distribution.
- CQS messages containing dedicated ‘Test Symbols’ for Listing Exchanges Cboe BZX, IEX, NYSE ARCA and NYSE American will route to multicast lines for Network ‘B’ according to the network and security symbol range distribution.
  - Dedicated ‘Test Symbols’ and their associated listing exchange are listed in the Field Descriptions section under the ‘Security Symbol’ field.

**Note:**

- Data Recipients are responsible for handling any symbol over any line. Redistribution of traffic may not occur intraday. Notification may not be sent to the Data Recipients regarding redistribution of traffic.

## 6.0 MESSAGE FORMATS

The Message Category and Message Type identify the Message and determine the format of the body. Each message transmitted by CQS consists of a Message Header and Message Body or Message Header only.

All messages formats, except for Category A Type H Unformatted (free form text) messages, have fixed field which is determined by reading the Message Header and Message Body.

A field description is provided as part of the Block Header format, Message Header format, Message Body or in the **Field Descriptions** section of this document.

## 6.1 Administrative Unformatted (free form text) Messages – Category A

The Administrative Unformatted (free form text) Category A message is designed to facilitate non-computerized miscellaneous information messages to CQS. The text section of the Administrative message is transmitted in free format (printable ASCII characters only).

### 6.1.1 Administrative Unformatted (free form text) – Category A Type H

**Varchar [maximum 900].** The Administrative Unformatted (free form text) Category A Type H message is used to provide administrative informational messages. The length of the free form text **cannot** exceed 900 characters. Administrative messages are disseminated over the CQS Multicast feed in the same format as it is received from a Participant.

Field Name	Length	Type	Value
Text	Maximum 900	Varchar [ ]	Free Form administrative informational message text
<b>Total Length</b>	<b>Maximum 900</b>		

## 6.2 Control Messages – Category C

Control messages consist of the standard **Message Header only**, and are **not** blocked with any other messages including Control messages.

When included in a retransmission sequence, the Retransmission Indicator field of a Control message contains code 'V'; otherwise this field contains the alphabetic upper case character 'O' (meaning original message).

### 6.2.1 Start of Day – Category C Type A

The Start of Day message signals the start of normal data dissemination over the multicast lines. The Start of Day message is sent three times with a quiescent period of one minute following each of the three transmissions.

The Block Sequence Number field in the Start of Day message always contains a block sequence number set to zero. The Block Sequence Number counter is reset to zero, and is not incremented during the normal Start of Day message transmission.

### 6.2.2 FINRA Close – Category C Type C

The FINRA Close message is transmitted by FINRA to CQS to indicate the Close state of FINRA Market Maker(s). All FINRA Market Maker quotes must be in either an Open or Close state where Open implies current and Close implies **not** current.

### 6.2.3 Reset Block Sequence Number – Category C Type L

The Reset Block Sequence Number message is transmitted when the block sequence number on an output multicast line requires resetting.

The Block Sequence Number field in the Reset Block Sequence Number message contains the number to which the Block Sequence Number counter is to be reset. This number is higher than the highest Block Sequence Number previously transmitted.

### 6.2.4 Start of Test Cycle – Category C Type M

The Start of Test Cycle message (transmitted before the Start of Day Category C Type A message is sent) is transmitted to signal the beginning of the transmission of test message cycles. Following the transmission of the Start of Test Cycle message, repeated test message cycles are transmitted.

### **6.2.5 End of Test Cycle – Category C Type N**

The End of Test Cycle message is transmitted to signal the end of the transmission of the repeated free form text test message cycles.

Test Cycle Notes:

- The purpose of test cycle messages is for Data Recipients to confirm systems and network connectivity.
- The test message cycles are repeated until shortly before transmission of the Start of Day Category C Type A message.
- Each repeated test message cycle contains repeated sequence numbers.

### **6.2.6 FINRA Open – Category C Type O**

The FINRA Open message is transmitted by FINRA to CQS. This message indicates the Open state of FINRA Market Maker(s). All FINRA Market Maker quotes must be in either an Open or Close state, whereby Open implies ‘current’ and Close implies not current.

### **6.2.7 Disaster Recovery Data Center Activation – Category C Type P**

The Disaster Recovery Data Center Activation message is transmitted to signify that the Consolidated Quotation System (CQS) has switched processing from the Primary Data Center to the Disaster Recovery Data Center. The Disaster Recovery Data Center Activation message is preceded by the transmission of a Reset Block Sequence Number Category C Type L message.

The Block Sequence Number field of the Disaster Recovery Data Center Activation message contains a number greater than the highest Block Sequence Number previously transmitted.

### **6.2.8 Line Integrity – Category C Type T**

The Line Integrity message is transmitted over the multicast lines at intervals of sixty (60) seconds to verify continued integrity of multicast transmission. The Line Integrity message transmission does not interrupt a transmission in progress.

The Block Sequence Number is not incremented for Line Integrity messages. The Block Sequence Number field will contain the Block Sequence Number of the last transmitted message.



### **6.2.9 End of Day – Category C Type Z**

The End of Day message is transmitted over the multicast lines to advise all Data Recipients that there are no further messages of any type transmitted for the day. The message is transmitted three times, with a quiescent line interval of one minute following each transmission.

The Block Sequence Number field of the End of Day message contains a number one greater than the highest Block Sequence Number previously transmitted. The Block Sequence Number counter is not incremented and the Block Sequence Number does not change when the message is transmitted the second and third time in the normal message transmission sequence.

**Note:**

- Under normal conditions, upon receiving the End of Day Category C Type Z message, it is the Data Recipient's responsibility to terminate their production CQS output multicast line feeds from SIAC.

## 6.3 Market Status Messages – Category M

Market Status messages are used to provide market data information.

Unless otherwise noted, detailed information on each field is contained in alphabetical order in the **Field Descriptions** section of this document.

### 6.3.1 Market-Wide Circuit Breaker Decline Level Status – Category M Type K

The Market-Wide Circuit Breaker Decline Level Status message is used to report the calculated Level 1, Level 2 and Level 3 threshold values for the current trading day necessary to trigger a circuit breaker. Levels are reset each trading day based on the closing value of the S&P 500 Index. If Levels are set as a result of inaccurate activity, Levels will be reset and disseminated. The most recently disseminated Levels will be in effect for that trading day.

**Note:**

- MWCB levels are index values (not prices) and have implied 6 decimal places.
- The Market-Wide Circuit Breaker Decline Level Status Message will be disseminated by CQS on a daily trading day basis at approximately 7:00 am and at 8:00 am ET; and additional occurrences if necessary, e.g., due to erroneously set Levels.

Field Name	Length	Type
MWCB Level 1	8	Signed Long
MWCB Level 2	8	Signed Long
MWCB Level 3	8	Signed Long
Reserved	1	TBD
<b>Total Length</b>	<b>25</b>	

### 6.3.2 Market-Wide Circuit Breaker Status – Category M Type L

The Market-Wide Circuit Breaker Status message is used to report the Market-Wide Circuit Breaker threshold Level that has been breached. Each Level will be disseminated only once during the trading day, unless a Level is breached as a result of erroneous activity. The most recently disseminated breached Level will be in effect.

The duration of Market-Wide Circuit Breaker Level 1 and Level 2 Regulatory Trading Halts is fifteen minutes. Following Level 3 Market-Wide Circuit Breaker Regulatory Trading Halts, trading will be halted for the remainder of the trading day and carried over to the following trading day in a Regulatory Trading Halted state.

Field Name	Length	Type
Market-Wide Circuit Breaker Level Indicator	1	Char
Reserved	1	TBD
<b>Total Length</b>	<b>2</b>	

## 6.4 Quote Messages – Category Q

### 6.4.1 Auction Status – Category Q Type A

The Auction Status message is used when a Participant in a CTA eligible security, Local Issue or a Bond reports requires Auction Information. Primary Listing Markets using an automated reopening will calculate Auction Collars, in compliance with rules around prices for re-opening, when applicable and will publish the Auction Status message. The initial Auction Collar will be published after the LULD Trading Pause. The ‘Number of Extensions’ field will reflect when a new Auction Status message has been published. The first Auction Collar extension, at the time of the LULD Trading Pause, will be set to zero (0) indicating the first Auction Status message and will increment by one (1) for each new Auction Status message sent during the LULD Trading Pause event.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Auction Collar Reference Price	8	Long
Auction Collar Upper Threshold Price	8	Long
Auction Collar Lower Threshold Price	8	Long
Number of Extensions	1	Byte
Short Sale Restriction Indicator	1	Char
Primary Listing Market Participant ID	1	Char
Financial Status Indicator	1	Char
<b>Reserved (for future use)</b>	<b>62</b>	<b>TBD</b>
<b>Total Length</b>	<b>102</b>	

### 6.4.2 Long Quote – Category Q Type L

The Long Quote message is used to report quote data for a CTA eligible Equity, Local Issue or Bonds. This message can also be used to report trading suspensions in a security, price indications and trading range indications. The Long Quote message is used by FINRA ADF only when either no FINRA BBO exists or there is no FINRA BBO change and will not be used to remove FINRA ADF from the NBBO. The Limit Up-Limit Down (LULD) Indicator is not applicable to FINRA ADF quotes.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Quote Condition	1	Char
Security Status Indicator	1	Char
Bid Price / Lower Limit Price Band	8	Long
Bid Size	4	Integer
Offer Price / Upper Limit Price Band	8	Long
Offer Size	4	Integer
Retail Interest Indicator	1	Char
Settlement Condition	1	Char
Market Condition	1	Char
FINRA Market Maker ID	4	Char [ ]
FINRA BBO Indicator	1	Char
Timestamp 2	8	2 x Integer
Short Sale Restriction Indicator	1	Char
Primary Listing Market Participant ID	1	Char
Financial Status Indicator	1	Char
SIP Generated Message Identifier	1	Char
Limit Up-Limit Down (LULD) Indicator	1	Char
National BBO LULD Indicator	1	Char
National BBO Indicator	1	Char
<b>Total Length</b>	<b>61</b>	

### 6.4.3 Short Quote – Category Q Type Q

The Short Quote message is used to report Bid and Offer quote information for **CTA eligible Equity only** (not used for Local Issues or Bonds) if the quote meets all the criteria and message format requirements, otherwise Long Quote message is used.

The Short Quote has the following criteria:	
1.	Instrument Type is implied 'CTA Eligible Equity'.
2.	Quote Condition is implied 'Regular' quote condition.
3.	Settlement Condition is implied regular way settlement.
4.	Market Condition is implied normal auction market.
5.	Quote is <u>not</u> from FINRA ADF.

Field Name	Length	Type
Security Symbol	5	Char [ ]
Bid Price	2	Short
Bid Size	2	Short
Offer Price	2	Short
Offer Size	2	Short
Primary Listing Market Participant ID	1	Char
National BBO Indicator	1	Char
<b>Total Length</b>	<b>15</b>	

#### 6.4.4 Special Long Quote (FINRA ADF) with FINRA BBO Information – Category Q Type S

The Special Quote (FINRA ADF) with FINRA BBO Information message is used only by FINRA to report the FINRA Best Bid and FINRA Best Offer for their Market Makers for CTA eligible Equity, Local Issue or Bond information Makers inclusive of changes to any existing FINRA BBO. The FINRA Best Bid and FINRA Best Offer will be used in the National Best Bid and Best Offer (NBBO) calculation.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Quote Condition	1	Char
Security Status Indicator	1	Char
Bid Price	8	Long
Bid Size	4	Integer
Offer Price	8	Long
Offer Size	4	Integer
Retail Interest Indicator	1	Char
Settlement Condition	1	Char
Market Condition	1	Char
FINRA Market Maker ID	4	Char [ ]
FINRA Best Bid Quote Condition	1	Char
FINRA Best Bid Price	8	Long
FINRA Best Bid Size	4	Integer
FINRA Best Bid Market Maker ID	4	Char [ ]
FINRA Best Offer Quote Condition	1	Char
FINRA Best Offer Price	8	Long
FINRA Best Offer Size	4	Integer
FINRA Best Offer Market Maker ID	4	Char [ ]
Timestamp 2	8	2 x Integer

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

---

**Special Long Quote (FINRA ADF) with BBO Information, *continued***

Field Name	Length	Type
Short Sale Restriction Indicator	1	Char
Primary Listing Market Participant ID	1	Char
Financial Status Indicator	1	Char
SIP Generated Message Identifier	1	Char
FINRA BBO LULD Indicator	1	Char
National BBO LULD Indicator	1	Char
National BBO Indicator	1	Char
<b>Total Length</b>	<b>94</b>	



#### 6.4.5 National Best Bid Short Appendage and National Best Offer Short Appendage

The National Best Bid Short Appendage and/or National Best Offer Short Appendage is generated whenever a new quote has caused a new National Best Bid and/or new National Best Offer and the Best Bid and/or Best Offer data meets all criteria. If any of the criteria are **not** met, the National Best Bid Long Appendage and/or the National Best Offer Long Appendage format are used. If it is determined that a National Best Bid Short Appendage and/or National Best Offer Short Appendage is required, the appropriate Best Bid and Best Offer information is appended following either the Short Quote, Long Quote or Special Long Quote (FINRA ADF) with FINRA BBO Information message. In instances when both a National Best Bid Short Appendage and a National Best Offer Short Appendage are generated, the National Best Bid Short Appendage will be appended first followed by the National Best Offer Short Appendage.

National Best Bid Short Appendage and National Best Offer Short Appendages have the following criteria:	
1.	Quote Condition is implied 'Regular' for the Best Bid and Best Offer.
2.	No FINRA Best Bid and/or FINRA Best Offer are involved in generating the National Best Bid and National Best Offer.

##### National Best Bid Short Appendage:

Field Name	Length	Type
Best Bid Participant ID	1	Char
Best Bid Price	2	Short
Best Bid Size	2	Short
<b>Total Length</b>	<b>5</b>	

##### National Best Offer Short Appendage:

Field Name	Length	Type
Best Offer Participant ID	1	Char
Best Offer Price	2	Short
Best Offer Size	2	Short
<b>Total Length</b>	<b>5</b>	

**Note:** For a transitional period only, both the National Best Bid and Offer (NBBO) will be generated in Short or Long Appendages when a new quote results in a new National Best Bid or Best Offer.

#### 6.4.6 National Best Bid Long Appendage and National Best Offer Long Appendage

The National Best Bid Long Appendage and/or National Best Offer Long Appendage are generated whenever a new quote has caused a new National Best Bid and/or new National Best Offer. If it is determined that a new National Best Bid Long Appendage and/or National Best Offer Long Appendage is required, the appropriate Best Bid and Best Offer information is appended following either the Short Quote, Long Quote or Special Long Quote (FINRA ADF) with FINRA BBO Information message. In instances when both a National Best Bid Long Appendage and a National Best Offer Long Appendage are generated, the National Best Bid Long Appendage will be appended first followed by the National Best Offer Long Appendage.

##### National Best Bid Long Appendage:

Field Name	Length	Type
Best Bid Participant ID	1	Char
Best Bid Quote Condition	1	Char
Best Bid Price	8	Long
Best Bid Size	4	Integer
FINRA Best Bid Market Maker ID	4	Char [ ]
<b>Total Length</b>	<b>18</b>	

##### National Best Offer Long Appendage:

Field Name	Length	Type
Best Offer Participant ID	1	Char
Best Offer Quote Condition	1	Char
Best Offer Price	8	Long
Best Offer Size	4	Integer
FINRA Best Offer Market Maker ID	4	Char [ ]
<b>Total Length</b>	<b>18</b>	

**Note:** For a transitional period only, both the National Best Bid and Offer (NBBO) will be generated in Short or Long Appendages when a new quote results in a new National Best Bid or Best Offer.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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## 7.0 FIELD DESCRIPTIONS

Field Name	Length	Description
Auction Collar Reference Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Auction Collar Reference Price represents the price used by the exchange to establish the Auction Collar.</p>
Auction Collar Lower Threshold Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>Represents the latest lower threshold price of the Auction Collar. The lower threshold price of the Auction Collar is the lowest price of the auction collar, if any.</p>
Auction Collar Upper Threshold Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>Represents the latest upper threshold price of the Auction Collar. The upper threshold price of the Auction Collar is the highest price of the auction collar, if any.</p>

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Best Bid Participant ID	1	Char. Space-filled.  Identifies the Participant that submitted the Best Bid on a consolidated basis.  Refer to <b>Participant ID</b> field description for Participant codes.
Best Bid Price	2 or 8	2 Short. Short have implied 2 decimal places and a maximum price of \$655.35.  8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Short or Long Optional set to zero.  Represents the Best Bid Price on a consolidated basis.
Best Bid Quote Condition	1	Char. Space-filled.  Identifies the Quote Condition associated with the Best Bid Price on a consolidated basis.
Best Bid Size	2 or 4	2 Short. Short have a maximum size of 65,535  4 Integer. Integer has a maximum size of 4,294,967,295 Short or Integer Optional set to zero.  Represents the Best Bid Size associated with the Best Bid Price on a consolidated basis.  Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are in 1, 10, 25 or 50 share round-lots.
Best Offer Participant ID	1	Char. Space-filled.  Identifies the Participant that submitted the Best Offer on a consolidated basis.  Refer to <b>Participant ID</b> field description for Participant codes.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Best Offer Price	2 or 8	<p>2 Short. Short have implied 2 decimal places and a maximum price of \$655.35.</p> <p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p>Short or Long Optional set to zero.</p> <p>Represents the Best Offer Price on a consolidated basis.</p>
Best Offer Quote Condition	1	<p>Char. Space-filled.</p> <p>Identifies the Quote Condition associated with the Best Offer Price on a consolidated basis.</p>
Best Offer Size	2 or 4	<p>2 Short. Short have a maximum size of 65,535</p> <p>4 Integer. Integer has a maximum size of 4,294,967,295</p> <p>Short or Integer Optional set to zero.</p> <p>Represents the Best Offer Size associated with the Best Bid Price on a consolidated basis.</p> <p>The Best Offer Size in units of trade represents the number of round-lots associated with the Best Bid Price for a security on a Consolidated basis.</p> <p>Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are in 1, 10, 25 or 50 share round-lots.</p>
Bid Price	2 or 8	<p>2 Short. Short have implied 2 decimal places and a maximum price of \$655.35.</p> <p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p>Short or Long Optional set to zero.</p> <p>Represents the highest price a prospective buyer is prepared to pay at a particular time for a security.</p> <p><b>When the Bid Price and the Bid Size fields are set to zeroes,</b> it represents a 'No Bid' quote, a 'No Quote' (i.e., neither a Bid nor an Offer, which zeroes out the quote) or an Opening Delay or Trading Halt condition. <b>If the Bid Size is set to zero and there is a Bid Price,</b> it represents either a Trading Range Indication or a Price Indication.</p>

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Bid Price / Lower Limit Price Band	8	<p>Long. Implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p><b><u>Bid Price</u></b>: represents the highest price a prospective buyer is prepared to pay at a particular time for a security.</p> <p><b>When the Bid Price and the Bid Size fields are set to zeroes</b>, it represents a 'No Bid' quote, a 'No Quote' (i.e., neither a Bid nor an Offer, which zeroes out the quote) or an Opening Delay or Trading Halt condition. If the <b>Bid Size</b> is set to zero and there is a <b>Bid Price</b>, it represents either a Trading Range Indication or a Price Indication.</p> <p><b><u>Lower Limit Price Band</u></b>: represents the lower price band value for a security.</p> <p>When the Security Status Indicator field code is 'Limit Up-Limit Down Price Band', the Lower Limit Price Band value will be contained in the Bid Price/Lower Limit Price Band fields.</p> <p>When the Lower Limit Price Band field is set to zero, it identifies that the previous Price Bands have been removed and are no longer effective for a security.</p>
Bid Size	2 or 4	<p>2 Short. Short have a maximum size of 65,535</p> <p>4 Integer. Integer has a maximum size of 4,294,967,295 Short or Integer Optional set to zero.</p> <p>The Bid Size identifies the number of round-lots, for a security.</p> <p>Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are in 1, 10, 25 or 50 share round-lots.</p> <p><b>When the Bid Size field is all zeroes</b>, it represents a 'No Bid' quote, a 'No Quote' (i.e., neither a Bid nor an Offer, which zeroes out the quote), a Trading Range Indication, or a Price Indication.</p>

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description																								
Financial Status Indicator	1	<div>Char.</div> <div>Identifies the financial status of the security.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>Financial Status Not Applicable</td></tr><tr><td>1</td><td>Bankrupt</td></tr><tr><td>2</td><td>Below Continuing Listing Standards</td></tr><tr><td>3</td><td>Bankrupt &amp; Below Continuing Listing Standards</td></tr><tr><td>4</td><td>Late Filing</td></tr><tr><td>5</td><td>Bankrupt &amp; Late Filing</td></tr><tr><td>6</td><td>Below Continuing Listing Standards &amp; Late Filing</td></tr><tr><td>7</td><td>Bankrupt, Below Continuing Listing Standards &amp; Late Filing</td></tr><tr><td>8</td><td>Creations Suspended (for Exchange Traded Products)</td></tr><tr><td>9</td><td>Redemptions Suspended (for Exchange Traded Products)</td></tr><tr><td>A</td><td>Liquidation (for Exchange Traded Products)</td></tr></table>	Code	Value	0	Financial Status Not Applicable	1	Bankrupt	2	Below Continuing Listing Standards	3	Bankrupt & Below Continuing Listing Standards	4	Late Filing	5	Bankrupt & Late Filing	6	Below Continuing Listing Standards & Late Filing	7	Bankrupt, Below Continuing Listing Standards & Late Filing	8	Creations Suspended (for Exchange Traded Products)	9	Redemptions Suspended (for Exchange Traded Products)	A	Liquidation (for Exchange Traded Products)
Code	Value																									
0	Financial Status Not Applicable																									
1	Bankrupt																									
2	Below Continuing Listing Standards																									
3	Bankrupt & Below Continuing Listing Standards																									
4	Late Filing																									
5	Bankrupt & Late Filing																									
6	Below Continuing Listing Standards & Late Filing																									
7	Bankrupt, Below Continuing Listing Standards & Late Filing																									
8	Creations Suspended (for Exchange Traded Products)																									
9	Redemptions Suspended (for Exchange Traded Products)																									
A	Liquidation (for Exchange Traded Products)																									
FINRA BBO Indicator	1	<div>Char.</div> <div>For FINRA, represents the FINRA BBO state of the FINRA quote.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>FINRA BBO Indicator Not Applicable (used by Participants other than FINRA)</td></tr><tr><td>A</td><td>No FINRA BBO Change</td></tr><tr><td>B</td><td>No FINRA BBO Exists</td></tr></table>	Code	Value	Space	FINRA BBO Indicator Not Applicable (used by Participants other than FINRA)	A	No FINRA BBO Change	B	No FINRA BBO Exists																
Code	Value																									
Space	FINRA BBO Indicator Not Applicable (used by Participants other than FINRA)																									
A	No FINRA BBO Change																									
B	No FINRA BBO Exists																									

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description												
FINRA BBO LULD Indicator	1	<p>Char.</p> <p>Indicates the affect that the Limit Up-Limit Down Price Bands have on the FINRA Best Bid and FINRA Best Offer (FBBO).</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Limit Up-Limit Down Not Applicable</td></tr><tr><td>A</td><td>FINRA Best Bid <b><u>and/or</u></b> FINRA Best Offer are Executable</td></tr><tr><td>B</td><td>FINRA Best Bid below Lower Limit Price Band – FINRA Best Bid is Non-Executable</td></tr><tr><td>C</td><td>FINRA Best Offer above Upper Limit Price Band – FINRA Best Offer is Non-Executable</td></tr><tr><td>D</td><td>FINRA Best Bid below Lower Limit Price Band <b><u>and</u></b> FINRA Best Offer above Upper Limit Price Band – FINRA Best Bid <b><u>and</u></b> FINRA Best Offer are Non-Executable</td></tr></table> <p><b>Note 1:</b> CQS will republish the FINRA Best Bid and FINRA Best Offer if existing FBBOs require adjustments as a result of Limit Up-Limit Down Price Band changes (e.g., an FBBO update to Executable from Non-Executable [or vice-versa]). Price Band messages will contain the <u>latest</u> National and modified FINRA BBO LULD Indicators.</p>	Code	Value	Space	Limit Up-Limit Down Not Applicable	A	FINRA Best Bid <b><u>and/or</u></b> FINRA Best Offer are Executable	B	FINRA Best Bid below Lower Limit Price Band – FINRA Best Bid is Non-Executable	C	FINRA Best Offer above Upper Limit Price Band – FINRA Best Offer is Non-Executable	D	FINRA Best Bid below Lower Limit Price Band <b><u>and</u></b> FINRA Best Offer above Upper Limit Price Band – FINRA Best Bid <b><u>and</u></b> FINRA Best Offer are Non-Executable
Code	Value													
Space	Limit Up-Limit Down Not Applicable													
A	FINRA Best Bid <b><u>and/or</u></b> FINRA Best Offer are Executable													
B	FINRA Best Bid below Lower Limit Price Band – FINRA Best Bid is Non-Executable													
C	FINRA Best Offer above Upper Limit Price Band – FINRA Best Offer is Non-Executable													
D	FINRA Best Bid below Lower Limit Price Band <b><u>and</u></b> FINRA Best Offer above Upper Limit Price Band – FINRA Best Bid <b><u>and</u></b> FINRA Best Offer are Non-Executable													
FINRA Best Bid Market Maker ID	4	<p>Char [4]. Left justified, space-filled.</p> <p>Contains the FINRA provided FINRA Best Bid Market Maker identifier of the Market Maker that had the FINRA Best Bid (FBBO).</p>												
FINRA Best Bid Price	8	<p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>Contains the FINRA provided FINRA Best Bid Price that is the FINRA Best Bid (FBBO).</p>												



CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
FINRA Best Bid Quote Condition	1	Char. Space-filled.  Contains the FINRA provided FINRA Best Bid Quote Condition associated with the FINRA Best Bid Price that had the FINRA Best Bid (FBBO).
FINRA Best Bid Size	4	4 Integer. Integer has a maximum size of 4,294,967,295 Optional set to zero.  Contains the FINRA provided FINRA Best Bid Size associated with the FINRA Best Bid Price that had the FINRA Best Bid (FBBO).  Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are in 1, 10, 25 or 50 share round-lots.
FINRA Best Offer Price	8	8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.  Contains the FINRA provided Best FINRA Offer Price that is the FINRA Best Offer (FBBO).
FINRA Best Offer Size	4	Integer. Integer has a maximum size of 4,294,967,295 Optional set to zero.  Contains the FINRA provided FINRA Best Offer Size associated with the FINRA Best Offer Price that had the FINRA Best Offer (FBBO).  Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are in 1, 10, 25 or 50 share round-lots.
FINRA Best Offer Market Maker ID	4	Char [4]. Left justified, space-filled.  Contains the FINRA provided FINRA Best Offer Market Maker identifier of the Market Maker that had the FINRA Best Offer (FBBO).

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description										
FINRA Best Offer Quote Condition	1	<p>Char. Space-filled.</p> <p>Contains the FINRA provided FINRA Best Offer Quote Condition associated with the Best FINRA Offer Price that had the FINRA Best Offer (FBBO).</p>										
FINRA Market Maker ID (MMID)	4	<p>Char [4]. Left justified, space-filled.</p> <p>Contains the FINRA Market Maker ID of the quoting participant on FINRA's Alternative Display Facility (ADF) or the FINRA ADF Identifier 'FNRA'.</p> <p><b>Note:</b> The FINRA ADF MMID 'FNRA' will be identified in CQS quote messages as follows:</p> <p>➤ Whenever CQS, on behalf of FINRA, generates closing quotes or as part of FINRA's 'End of Participant Quote Reporting' closing routine (<i>Reference Appendix E – Closing Routine</i>), quote messages will be generated containing the following characteristics:</p> <ul style="list-style-type: none"><li>▪ Participant ID 'D' in the Message Header</li><li>▪ Quote Condition 'L' – Market Maker Closed (FINRA)</li><li>▪ Zero-filled bid and/or offer prices and zero-filled bid and/or offer sizes</li></ul> <p>➤ Whenever CQS on behalf of FINRA removes FINRA from the Best Bid and Best Offer CQS will generate quote messages containing the following characteristics:</p> <ul style="list-style-type: none"><li>▪ Participant ID 'D' in the Message Header</li><li>▪ Quote Condition 'R' – Regular</li><li>▪ Zero-filled bid and/or offer prices and zero-filled bid and/or offer sizes</li></ul> <p><b>Note:</b> When CQS is the originator of a quote message the SIP Generated Message Identifier field will be populated with 'S'.</p>										
Instrument Type	1	<p>Char.</p> <p>Identifies the instrument type relevant to the quote.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>CTA Eligible Equity</td></tr><tr><td>1</td><td>Local Issue</td></tr><tr><td>2</td><td>Corporate Bond</td></tr><tr><td>3</td><td>Government Bond</td></tr></table>	Code	Value	0	CTA Eligible Equity	1	Local Issue	2	Corporate Bond	3	Government Bond
Code	Value											
0	CTA Eligible Equity											
1	Local Issue											
2	Corporate Bond											
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CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description								
Limit Up-Limit Down (LULD) Indicator	1	<p>Char.</p> <p>Indicates the affect the Quote has on the Limit Up-Limit Down Price Band range.</p> <p>An Offer Price that is below the Lower Limit Price Band, or a Bid Price that is above the Upper Limit Price Band is identified as follows:</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Limit Up-Limit Down Not Applicable</td></tr><tr><td>A</td><td>Bid Price above Upper Limit Price Band – Bid is Non-Executable</td></tr><tr><td>B</td><td>Offer Price below Lower Limit Price Band Offer is Non-Executable</td></tr></table> <p><b>Note 1:</b> If a Bid or an Offer is marked as Non-Executable, it will not qualify for inclusion in the BBO calculations.</p> <p><b>Note 2:</b> CQS will modify and republish a quote if existing Participant quotations require adjustments as a result of Limit Up-Limit Down Price Band changes, e.g., an update to a Bid/Offer Price to Executable from Non-Executable (or vice-versa). Price Band messages will contain the latest National and FINRA BBO LULD Indicators as well as the National and FINRA Best Bids and Best Offers.</p> <p><b>Note 3:</b> CQS will be identified as the source of a republished Quote in the SIP Generated Message Identifier field, and the Message Header Participant ID field will identify the Participant that initiated the original Quote message.</p> <p><b>Note 4:</b> Limit Up-Limit Down’ is not applicable to Local Issues or Bonds.</p>	Code	Value	Space	Limit Up-Limit Down Not Applicable	A	Bid Price above Upper Limit Price Band – Bid is Non-Executable	B	Offer Price below Lower Limit Price Band Offer is Non-Executable
Code	Value									
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CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

## FIELD DESCRIPTIONS

Field Name	Length	Description										
Market Condition	1	<p>Char.</p> <p>Identifies the market condition of a quote for a security. <b>Crossed Market</b> and <b>Locked Market</b> are only applicable to Government Bonds. In cases of a <b>Normal Auction Market</b>, the Bid Price must be less than the Offer Price. In cases of a <b>Crossed Market</b>, the Bid Price must be greater than the Offer Price. In cases of a <b>Locked Market</b>, the Bid Price must be equal to the Offer Price.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Normal Auction Market</td></tr><tr><td>A</td><td>Crossed Market</td></tr><tr><td>B</td><td>Locked Market</td></tr></table>	Code	Value	Space	Normal Auction Market	A	Crossed Market	B	Locked Market		
Code	Value											
Space	Normal Auction Market											
A	Crossed Market											
B	Locked Market											
Market-Wide Circuit Breaker (MWCB) Level Indicator	1	<p>Char.</p> <p>Identifies the threshold level that was breached.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>MWCB Not Applicable</td></tr><tr><td>1</td><td>Level 1 Breached</td></tr><tr><td>2</td><td>Level 2 Breached</td></tr><tr><td>3</td><td>Level 3 Breached</td></tr></table>	Code	Value	Space	MWCB Not Applicable	1	Level 1 Breached	2	Level 2 Breached	3	Level 3 Breached
Code	Value											
Space	MWCB Not Applicable											
1	Level 1 Breached											
2	Level 2 Breached											
3	Level 3 Breached											
MWCB Level 1	8	<p>Signed Long. MWCB Level 1 value represents an <u>index value (i.e., not a price)</u> and has <u>implied 6 decimal places</u> and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807.</p> <p>Identifies the daily established drop level value (trigger value) associated with each Decline Level:</p> <ul style="list-style-type: none"><li>Level 1 = 7% of Previous Close S&amp;P 500 Value</li></ul>										

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
MWCB Level 2	8	<p>Signed Long. MWCB Level 2 value represents an <u>index value (i.e., not a price)</u> and has <u>implied 6 decimal places</u> and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807.</p> <p>Identifies the daily established drop level value (trigger value) associated with each Decline Level:</p> <ul style="list-style-type: none"><li>▪ Level 2 = 13% of Previous Close S&amp;P 500 Value</li></ul>
MWCB Level 3	8	<p>Signed Long. MWCB Level 3 value represents an <u>index value (i.e., not a price)</u> and has <u>implied 6 decimal places</u> and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807.</p> <p>Identifies the daily established drop level value (trigger value) associated with each Decline Level:</p> <ul style="list-style-type: none"><li>▪ Level 3 = 20% of Previous Close S&amp;P 500 Value</li></ul>

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

## FIELD DESCRIPTIONS

Field Name	Length	Description																		
National BBO Indicator (NBBO)	1	<p>Char.</p> <p>Indicates the affect the new quote has on the National BBO. If it is determined that a new National BBO appendage is required, the appropriate BBO information is appended following the Short Quote or Long Quote message. A National appendage is not present, if it is determined that the current quote is the new National BBO or does <b>not</b> affect the BBO.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space*</td><td>Indicates that the new quote did not meet the BBO requirements. This quote is not included in the BBO.</td></tr><tr><td>A</td><td><b>No Best Bid change, No Best Offer change</b> New quote does not affect the Best Bid or Best Offer. No appendage is required.</td></tr><tr><td>B*</td><td><b>No Best Bid change, Quote contains Best Offer</b> New quote does not affect the Best Bid, but is the Best Offer. No appendage is required.</td></tr><tr><td>C*</td><td><b>No Best Bid Change, Best Offer Short Appendage</b> New quote does not affect the Best Bid, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Short Appendage.</td></tr><tr><td>D*</td><td><b>No Best Bid Change, Best Offer Long Appendage</b> New quote does not affect the Best Bid, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Long Appendage.</td></tr><tr><td>E*</td><td><b>No Best Bid Change, No Best Offer</b> New quote does not affect the Best Bid, and there is no Best Offer. No appendage is required.</td></tr><tr><td>F*</td><td><b>Quote contains Best Bid, No Best Offer Change</b> New quote is itself the Best Bid, but does not affect the Best Offer. No appendage is required.</td></tr><tr><td>G</td><td><b>Quote contains Best Bid, Quote contains Best Offer</b> New quote is itself the Best Bid and Best Offer. No appendage is required.</td></tr></table> <p><b>*Indicator Codes to be used in the future</b></p>	Code	Value	Space*	Indicates that the new quote did not meet the BBO requirements. This quote is not included in the BBO.	A	<b>No Best Bid change, No Best Offer change</b> New quote does not affect the Best Bid or Best Offer. No appendage is required.	B*	<b>No Best Bid change, Quote contains Best Offer</b> New quote does not affect the Best Bid, but is the Best Offer. No appendage is required.	C*	<b>No Best Bid Change, Best Offer Short Appendage</b> New quote does not affect the Best Bid, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Short Appendage.	D*	<b>No Best Bid Change, Best Offer Long Appendage</b> New quote does not affect the Best Bid, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Long Appendage.	E*	<b>No Best Bid Change, No Best Offer</b> New quote does not affect the Best Bid, and there is no Best Offer. No appendage is required.	F*	<b>Quote contains Best Bid, No Best Offer Change</b> New quote is itself the Best Bid, but does not affect the Best Offer. No appendage is required.	G	<b>Quote contains Best Bid, Quote contains Best Offer</b> New quote is itself the Best Bid and Best Offer. No appendage is required.
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CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																		
National BBO Indicator (NBBO) <i>continued</i>	1	<div>Char.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>H*</td><td><b>Quote contains Best Bid, Best Offer Short Appendage</b> New quote is itself the Best Bid, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Short Appendage.</td></tr><tr><td>I*</td><td><b>Quote contains Best Bid, Best Offer Long Appendage</b> New quote is itself the Best Bid, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Long Appendage.</td></tr><tr><td>J*</td><td><b>Quote contains Best Bid, No Best Offer</b> New quote is itself the Best Bid, and there is no Best Offer. No appendage is required.</td></tr><tr><td>K*</td><td><b>No Best Bid, No Best Offer Change</b> There is no Best Bid, and the quote does not affect the Best Offer. No appendage is required.</td></tr><tr><td>L*</td><td><b>No Best Bid, Quote contains Best Offer</b> There is no Best Bid, and the quote is itself the Best Offer. No appendage is required.</td></tr><tr><td>M*</td><td><b>No Best Bid, Best Offer Short Appendage</b> There is no Best Bid, a new Best Offer is generated and the new Best Offer is contained in the Best Offer Short Appendage.</td></tr><tr><td>N*</td><td><b>No Best Bid, Best Offer Long Appendage</b> There is no Best Bid, a new Best Offer is generated and the new Best Offer is contained in the Best Offer Long Appendage.</td></tr><tr><td>O</td><td><b>No Best Bid, No Best Offer</b> There is no Best Bid, and no Best Offer. No appendage is required.</td></tr></table> <div>*Indicator Codes to be used in the future</div>	Code	Value	H*	<b>Quote contains Best Bid, Best Offer Short Appendage</b> New quote is itself the Best Bid, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Short Appendage.	I*	<b>Quote contains Best Bid, Best Offer Long Appendage</b> New quote is itself the Best Bid, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Long Appendage.	J*	<b>Quote contains Best Bid, No Best Offer</b> New quote is itself the Best Bid, and there is no Best Offer. No appendage is required.	K*	<b>No Best Bid, No Best Offer Change</b> There is no Best Bid, and the quote does not affect the Best Offer. No appendage is required.	L*	<b>No Best Bid, Quote contains Best Offer</b> There is no Best Bid, and the quote is itself the Best Offer. No appendage is required.	M*	<b>No Best Bid, Best Offer Short Appendage</b> There is no Best Bid, a new Best Offer is generated and the new Best Offer is contained in the Best Offer Short Appendage.	N*	<b>No Best Bid, Best Offer Long Appendage</b> There is no Best Bid, a new Best Offer is generated and the new Best Offer is contained in the Best Offer Long Appendage.	O	<b>No Best Bid, No Best Offer</b> There is no Best Bid, and no Best Offer. No appendage is required.
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CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description														
National BBO Indicator (NBBO) <i>continued</i>	1	<div>Char.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>P*</td><td><b>Best Bid Short Appendage, No Best Offer Change</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Short Appendage, but the quote does not affect the Best Offer.</td></tr><tr><td>Q*</td><td><b>Best Bid Long Appendage, No Best Offer Change</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Long Appendage, but the quote does not affect the Best Offer.</td></tr><tr><td>R*</td><td><b>Best Bid Short Appendage, Quote contains Best Offer</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Short Appendage, and the quote is the Best Offer.</td></tr><tr><td>S*</td><td><b>Best Bid Long Appendage, Quote contains Best Offer</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Long Appendage, and the quote is the Best Offer.</td></tr><tr><td>T</td><td><b>Best Bid Short Appendage, Best Offer Short Appendage</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Short Appendage, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Short Appendage.</td></tr><tr><td>U</td><td><b>Best Bid Long Appendage, Best Offer Long Appendage</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Long Appendage, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Long Appendage.</td></tr></table> <div>*Indicator Codes to be used in the future</div>	Code	Value	P*	<b>Best Bid Short Appendage, No Best Offer Change</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Short Appendage, but the quote does not affect the Best Offer.	Q*	<b>Best Bid Long Appendage, No Best Offer Change</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Long Appendage, but the quote does not affect the Best Offer.	R*	<b>Best Bid Short Appendage, Quote contains Best Offer</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Short Appendage, and the quote is the Best Offer.	S*	<b>Best Bid Long Appendage, Quote contains Best Offer</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Long Appendage, and the quote is the Best Offer.	T	<b>Best Bid Short Appendage, Best Offer Short Appendage</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Short Appendage, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Short Appendage.	U	<b>Best Bid Long Appendage, Best Offer Long Appendage</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Long Appendage, a new Best Offer is generated and the new Best Offer information is contained in the Best Offer Long Appendage.
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CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description						
National BBO Indicator (NBBO) <i>continued</i>	1	<div>Char.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>V*</td><td><b>Best Bid Short Appendage, No Best Offer</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Short Appendage, and there is no Best Offer.</td></tr><tr><td>W*</td><td><b>Best Bid Long Appendage, No Best Offer</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Long Appendage, and there is no Best Offer.</td></tr></table> <div>*Indicator Codes to be used in the future</div>	Code	Value	V*	<b>Best Bid Short Appendage, No Best Offer</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Short Appendage, and there is no Best Offer.	W*	<b>Best Bid Long Appendage, No Best Offer</b> A new Best Bid is generated and the new Best Bid information is contained in the Best Bid Long Appendage, and there is no Best Offer.
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CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																						
National BBO LULD Indicator	1	Char.																						
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		A	National Best Bid <b><u>and</u> / <u>or</u></b> National Best Offer are Executable																					
		B	National Best Bid below Lower Limit Price Band – National Best Bid is Non-Executable																					
		C	National Best Offer above Upper Limit Price Band – National Best Offer is Non-Executable																					
		D	National Best Bid below Lower Limit Price Band <b><u>and</u></b> National Best Offer above Upper Limit Price Band – National Best Bid <b><u>and</u></b> National Best Offer are Non-Executable																					
		E	National Best Bid equals Upper Limit Price Band – National Best Bid is in Limit State																					
		F	National Best Offer equals Lower Limit Price Band – National Best Offer is in Limit State																					
		G	National Best Bid equals Upper Limit Price Band – National Best Bid is in Limit State <b><u>and</u></b> National Best Offer above Upper Limit Price Band – National Best Offer is Non-Executable																					
H	National Best Bid below Lower Limit Price Band – National Best Bid is Non-Executable <b><u>and</u></b> National Best Offer equals Lower Limit Price Band – National Best Offer is in Limit State																							
I	National Best Bid equals Upper Limit Price Band <b><u>and</u></b> National Best Offer equals Lower Limit Price Band (Crossed - <b><u>NOT</u> in Limit State</b> )																							

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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## FIELD DESCRIPTIONS

Field Name	Length	Description
National BBO LULD Indicator, <i>continued</i>	1	<p><b>Note 1:</b> CQS will modify and republish an NBBO if existing NBBO's require adjustments as a result of Limit Up-Limit Down Price Band changes (e.g., an update to an NBBO to Executable from Non-Executable (or vice-versa). Price Band messages will contain the latest National and FINRA BBO LULD Indicators as well as the National Best Bids and Best Offers.</p> <p><b>Note 2:</b> CQS will be identified as the source of a republished NBBO in the SIP Generated Message Identifier field, and the Message Header Participant ID field will identify the Participant that initiated the original Quote message.</p> <p><b>Note 3:</b> CQS will populate the 'National BBO LULD Indicator' field with a 'Space' as follows:</p> <ul style="list-style-type: none"> <li>(a) Prior to regular trading hours and after regular trading hours.</li> <li>(b) When the current quote does not affect the NBBO (e.g., BBO non-qualifying quote conditions such as Non-Firm quotes).</li> <li>(c) When Price Bands are not in effect (e.g., Price Bands with zero values prevailing).</li> <li>(d) Until the Price Band for a symbol is published.</li> <li>(e) If no eligible quotes have taken place.</li> </ul>
Number of Extensions	1	<p>Byte. Optional set to zero.</p> <p>Identifies the number of manual or automatic extensions the applicable auction has received. The first Auction Collar extension, at the time of the LULD Trading Pause, will be set to zero (0) indicating the first Auction Status message and will increment by one (1) for each new Auction Status message sent during the LULD Trading Pause event.</p>

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Offer Price	2 or 8	<p>2 Short. Short have implied 2 decimal places and a maximum price of \$655.35.</p> <p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p>Short or Long Optional set to zero.</p> <p>Represents the lowest price acceptable to a prospective seller at a particular time for a security.</p> <p><b>When the Offer Price and the Offer Size fields are all set to zeroes</b>, this represents a 'No Offer' quote, a 'No Quote' (i.e., neither a Bid nor an Offer, which zeroes out the quote) or an Opening Delay or Trading Halt condition. <b>If the Offer Size is set to zero</b> and there is an <b>Offer Price</b>, it represents either a Trading Range Indication or a Price Indication.</p>
Offer Price / Upper Limit Price Band	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p><b><u>Offer Long Price:</u></b> represents the lowest price acceptable to a prospective seller at a particular time for a security.</p> <p><b>When the Offer Price and the Offer Size fields are all set to zeroes</b>, this represents a 'No Offer' quote, a 'No Quote' (i.e., neither a Bid nor an Offer, which zeroes out the quote) or an Opening Delay or Trading Halt condition. <b>If the Offer Size is set to zero</b> and there is an <b>Offer Price</b>, it represents either a Trading Range Indication or a Price Indication.</p> <p><b><u>Upper Limit Price Band:</u></b> represents the upper price band value for a security.</p> <p>When the Security Status Indicator field code is 'Limit Up-Limit Down Price Bands, the Upper Limit Price Band value will be contained in the Offer Price/Upper Limit Price Band field.</p> <p>When the Upper Limit Price Band field is set to zero, it identifies that the previous Price Bands have been removed and are no longer effective.</p>

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

## FIELD DESCRIPTIONS

Field Name	Length	Description																																				
Offer Size	2 or 4	<p>2 Short. Short have a maximum size of 65,535</p> <p>4 Integer. Integer has a maximum size of 4,294,967,295 Short or Integer Optional set to zero.</p> <p>The Offer Size identifies the number of round-lots, for a security.</p> <p>Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are in 1, 10, 25 or 50 share round-lots.</p> <p><b>If the Offer Size is set to zero</b> and there is an <b>Offer Price</b>, it represents either a Trading Range Indication or a Price Indication.</p>																																				
Primary Listing Market Participant ID	1	<p>Char.</p> <p>Identifies the Primary Listing Market for a security.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Primary Listing Market Participant ID Not Applicable</td></tr><tr><td>A</td><td>NYSE American</td></tr><tr><td>B</td><td>NASDAQ OMX BX</td></tr><tr><td>C</td><td>NYSE National</td></tr><tr><td>D</td><td>FINRA</td></tr><tr><td>I</td><td>ISE</td></tr><tr><td>J</td><td>Cboe EDGA</td></tr><tr><td>K</td><td>Cboe EDGX</td></tr><tr><td>M</td><td>CHX</td></tr><tr><td>N</td><td>NYSE</td></tr><tr><td>P</td><td>NYSE Arca</td></tr><tr><td>T</td><td>NASDAQ</td></tr><tr><td>V</td><td>IEX</td></tr><tr><td>W</td><td>CBSX</td></tr><tr><td>X</td><td>NASDAQ OMX PSX</td></tr><tr><td>Y</td><td>Cboe BYX</td></tr><tr><td>Z</td><td>Cboe BZX</td></tr></table>	Code	Value	Space	Primary Listing Market Participant ID Not Applicable	A	NYSE American	B	NASDAQ OMX BX	C	NYSE National	D	FINRA	I	ISE	J	Cboe EDGA	K	Cboe EDGX	M	CHX	N	NYSE	P	NYSE Arca	T	NASDAQ	V	IEX	W	CBSX	X	NASDAQ OMX PSX	Y	Cboe BYX	Z	Cboe BZX
Code	Value																																					
Space	Primary Listing Market Participant ID Not Applicable																																					
A	NYSE American																																					
B	NASDAQ OMX BX																																					
C	NYSE National																																					
D	FINRA																																					
I	ISE																																					
J	Cboe EDGA																																					
K	Cboe EDGX																																					
M	CHX																																					
N	NYSE																																					
P	NYSE Arca																																					
T	NASDAQ																																					
V	IEX																																					
W	CBSX																																					
X	NASDAQ OMX PSX																																					
Y	Cboe BYX																																					
Z	Cboe BZX																																					

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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## FIELD DESCRIPTIONS

Field Name	Length	Description																														
Quote Condition	1	<p>Char.</p> <p>Denotes a particular condition applicable to the quote. The Quote Condition is used to determine whether a quote qualifies for the Best Bid and Best Offer calculation. When the Quote Condition field is not provided, the Security Status Indicator field will be provided.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Quote Condition Not Applicable When Quote Condition is space filled, the Security Status Indicator field must contain a value other than space.</td></tr><tr><td>A</td><td>Slow Quote on Offer Side (Eligible for BBO)</td></tr><tr><td>B</td><td>Slow Quote on Bid Side (Eligible for BBO)</td></tr><tr><td>C</td><td>Closing (Not eligible for BBO)</td></tr><tr><td>E</td><td>Slow Quote Due to LRP or Gap Quote on the Bid Side (ONLY OFFER SIDE is eligible for BBO)</td></tr><tr><td>F</td><td>Slow Quote Due to LRP or Gap Quote on the Offer Side (ONLY BID SIDE is eligible for BBO)</td></tr><tr><td>H</td><td>Slow Quote on the Bid and Offer Sides (Eligible for BBO)</td></tr><tr><td>L</td><td>Closed Market Maker (FINRA) (Not eligible for BBO)</td></tr><tr><td>N</td><td>Non-Firm Quote (Not eligible for BBO)</td></tr><tr><td>O</td><td>Opening Quote (Eligible for BBO)</td></tr><tr><td>R</td><td>Regular (FINRA Open) (Eligible for BBO)</td></tr><tr><td>U</td><td>Slow Quote Due to Liquidity Replenishment Point (LRP), or Gap Quote on Both the Bid and Offer Sides (Not eligible for BBO)</td></tr><tr><td>W</td><td>Slow Quote Due to Set Slow List on Both the Bid and Offer Sides (Eligible for BBO)</td></tr><tr><td>4</td><td>On Demand Intra-Day Auction (Not eligible for BBO)</td></tr></table>	Code	Value	Space	Quote Condition Not Applicable When Quote Condition is space filled, the Security Status Indicator field must contain a value other than space.	A	Slow Quote on Offer Side (Eligible for BBO)	B	Slow Quote on Bid Side (Eligible for BBO)	C	Closing (Not eligible for BBO)	E	Slow Quote Due to LRP or Gap Quote on the Bid Side (ONLY OFFER SIDE is eligible for BBO)	F	Slow Quote Due to LRP or Gap Quote on the Offer Side (ONLY BID SIDE is eligible for BBO)	H	Slow Quote on the Bid and Offer Sides (Eligible for BBO)	L	Closed Market Maker (FINRA) (Not eligible for BBO)	N	Non-Firm Quote (Not eligible for BBO)	O	Opening Quote (Eligible for BBO)	R	Regular (FINRA Open) (Eligible for BBO)	U	Slow Quote Due to Liquidity Replenishment Point (LRP), or Gap Quote on Both the Bid and Offer Sides (Not eligible for BBO)	W	Slow Quote Due to Set Slow List on Both the Bid and Offer Sides (Eligible for BBO)	4	On Demand Intra-Day Auction (Not eligible for BBO)
Code	Value																															
Space	Quote Condition Not Applicable When Quote Condition is space filled, the Security Status Indicator field must contain a value other than space.																															
A	Slow Quote on Offer Side (Eligible for BBO)																															
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H	Slow Quote on the Bid and Offer Sides (Eligible for BBO)																															
L	Closed Market Maker (FINRA) (Not eligible for BBO)																															
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CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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## FIELD DESCRIPTIONS

Field Name	Length	Description										
Quote Condition, <i>continued</i>		<b>Note:</b> If a BBO qualifying Bid or Offer is marked as Non-Executable in the ‘Limit Up-Limit Down (LULD) Indicator’ field, the Non-Executable Bid or Offer side will <u>not qualify</u> for inclusion in the BBO calculations.										
Reserved	1	Space-filled. Field is reserved for future use.										
Retail Interest Indicator	1	<p>Char.</p> <p>When Retail Price Improvement (RPI) interest is priced better than the Protected Best Bid or Offer (PBBO) by a minimum of \$0.001, an indication of interest on the Bid, Offer, or both the Bid and Offer will identify that interest will be eligible to interact with incoming Retail Order interest.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Retail Interest Indicator Not Applicable</td></tr><tr><td>A</td><td>Retail Interest on Bid Quote</td></tr><tr><td>B</td><td>Retail Interest on Offer Quote</td></tr><tr><td>C</td><td>Retail Interest on both the Bid and Offer Quotes</td></tr></table>	Code	Value	Space	Retail Interest Indicator Not Applicable	A	Retail Interest on Bid Quote	B	Retail Interest on Offer Quote	C	Retail Interest on both the Bid and Offer Quotes
Code	Value											
Space	Retail Interest Indicator Not Applicable											
A	Retail Interest on Bid Quote											
B	Retail Interest on Offer Quote											
C	Retail Interest on both the Bid and Offer Quotes											

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																																																																				
Security Status Indicator	1	<div><div>Char.</div><div>The Security Status Indicator field is used to report trading suspensions in a security, price indications, trading range indications, LULD Price Bands and Market Wide Circuit Breaker activity. When the Security Status Indicator is provided, the Quote Condition field must be space filled. If the Security Status Indicator is populated with either a regulatory or a non-regulatory status (other than Market Wide Circuit Breaker Levels), it will result in the NBBO being recalculated excluding the Participant from the NBBO if that Participant was part or all of the NBBO.</div></div> <table><tr><th></th><th></th><th>Regulatory</th><th>Non Regulatory</th></tr><tr><th>Code</th><th>Value</th><th></th><th></th></tr><tr><td>Space</td><td>Security Status Indicator Not Applicable When Security Status Indicator is space filled, the Quote Condition field must contain a value other than space.</td><td></td><td></td></tr><tr><td>D</td><td>News Dissemination</td><td>X</td><td></td></tr><tr><td>G</td><td>Trading Range Indication</td><td></td><td></td></tr><tr><td>I</td><td>Order Imbalance</td><td></td><td>X</td></tr><tr><td>M</td><td>Limit-Up-Limit Down (LULD) Trading Pause</td><td>X</td><td></td></tr><tr><td>P</td><td>News Pending</td><td>X</td><td></td></tr><tr><td>T</td><td>Resume*</td><td></td><td></td></tr><tr><td>X</td><td>Operational</td><td></td><td>X</td></tr><tr><td>Y</td><td>Sup-Penny Trading</td><td></td><td>X</td></tr><tr><td>Z</td><td>No Open-No Resume**</td><td></td><td></td></tr><tr><td>0</td><td>Limit Up-Limit Down (LULD) Price Band</td><td></td><td></td></tr><tr><td>1</td><td>Market-Wide Circuit Breaker Level 1 – Breached</td><td>X</td><td></td></tr><tr><td>2</td><td>Market-Wide Circuit Breaker Level 2 – Breached</td><td>X</td><td></td></tr><tr><td>3</td><td>Market-Wide Circuit Breaker Level 3 – Breached</td><td>X</td><td></td></tr><tr><td>9</td><td>Republished Limit Up-Limit Down (LULD) Price Band</td><td></td><td></td></tr></table> <div><div>* Used to indicate that trading for a Participant is no longer suspended in a security which had been Opening Delayed or Trading Halted.</div><div>** Used to indicate that an Opening Delay or a Trading Halt is to be in effect for the rest of the trading day in a security for a Participant.</div></div>			Regulatory	Non Regulatory	Code	Value			Space	Security Status Indicator Not Applicable When Security Status Indicator is space filled, the Quote Condition field must contain a value other than space.			D	News Dissemination	X		G	Trading Range Indication			I	Order Imbalance		X	M	Limit-Up-Limit Down (LULD) Trading Pause	X		P	News Pending	X		T	Resume*			X	Operational		X	Y	Sup-Penny Trading		X	Z	No Open-No Resume**			0	Limit Up-Limit Down (LULD) Price Band			1	Market-Wide Circuit Breaker Level 1 – Breached	X		2	Market-Wide Circuit Breaker Level 2 – Breached	X		3	Market-Wide Circuit Breaker Level 3 – Breached	X		9	Republished Limit Up-Limit Down (LULD) Price Band		
		Regulatory	Non Regulatory																																																																			
Code	Value																																																																					
Space	Security Status Indicator Not Applicable When Security Status Indicator is space filled, the Quote Condition field must contain a value other than space.																																																																					
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T	Resume*																																																																					
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0	Limit Up-Limit Down (LULD) Price Band																																																																					
1	Market-Wide Circuit Breaker Level 1 – Breached	X																																																																				
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3	Market-Wide Circuit Breaker Level 3 – Breached	X																																																																				
9	Republished Limit Up-Limit Down (LULD) Price Band																																																																					



CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

## FIELD DESCRIPTIONS

Field Name	Length	Description																												
Security Symbol	5 or 11	<p>Char [5] or [11]. Left justified, space-filled.</p> <p>Contains the security symbol. Suffixes start with one of the following characters with no embedded spaces: (1) ASCII Period (.), (2) lower case p, (3) lower case r, or (4) lower case w.</p> <p><b>Note:</b> CQS will allow for a base or root symbol to consist of from one (1) up to six (6) characters with the remaining characters in the security symbol field available for possible suffixes.</p> <p><b>Identification of Test Data:</b> The purpose of a Test Message is to have a mechanism whereby end-to-end connectivity and functionality between the CQS Participant and Data Recipient can be tested prior to the opening or during normal operational hours.</p> <p>Messages with any of the dedicated test symbols will be included in Participant statistics (e.g., National BBO calculations), but will be excluded in quote counts, etc.</p> <p>Alphanumeric Test Symbols are reserved for future use.</p> <table><tr><th>Listing Exchange</th><th>Test Symbol</th></tr><tr><td rowspan="4">NYSE</td><td>CBO</td></tr><tr><td>CBX</td></tr><tr><td>NTEST</td></tr><tr><td>01N thru 12N</td></tr><tr><td rowspan="3">NYSE American</td><td>IBO</td></tr><tr><td>ATEST</td></tr><tr><td>01A thru 12A</td></tr><tr><td rowspan="6">NYSE Arca</td><td>IGZ</td></tr><tr><td>ZVV</td></tr><tr><td>ZZK</td></tr><tr><td>ZZZ</td></tr><tr><td>PTEST</td></tr><tr><td>01P thru 12P</td></tr><tr><td rowspan="4">Cboe BZX</td><td>ZBZX</td></tr><tr><td>ZTEST</td></tr><tr><td>ZTST</td></tr><tr><td>01Z thru 12Z</td></tr><tr><td rowspan="4">IEX</td><td>ZIEXT</td></tr><tr><td>ZEXIT</td></tr><tr><td>ZXIET</td></tr><tr><td>01Vthru 12V</td></tr></table>	Listing Exchange	Test Symbol	NYSE	CBO	CBX	NTEST	01N thru 12N	NYSE American	IBO	ATEST	01A thru 12A	NYSE Arca	IGZ	ZVV	ZZK	ZZZ	PTEST	01P thru 12P	Cboe BZX	ZBZX	ZTEST	ZTST	01Z thru 12Z	IEX	ZIEXT	ZEXIT	ZXIET	01Vthru 12V
Listing Exchange	Test Symbol																													
NYSE	CBO																													
	CBX																													
	NTEST																													
	01N thru 12N																													
NYSE American	IBO																													
	ATEST																													
	01A thru 12A																													
NYSE Arca	IGZ																													
	ZVV																													
	ZZK																													
	ZZZ																													
	PTEST																													
	01P thru 12P																													
Cboe BZX	ZBZX																													
	ZTEST																													
	ZTST																													
	01Z thru 12Z																													
IEX	ZIEXT																													
	ZEXIT																													
	ZXIET																													
	01Vthru 12V																													

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description												
Settlement Condition	1	<div>Char.</div> <div>Identifies the settlement condition for a security.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Regular Way Settlement</td></tr><tr><td>A</td><td>Cash (only) Settlement</td></tr><tr><td>B</td><td>Next Day (only) Settlement</td></tr></table>	Code	Value	Space	Regular Way Settlement	A	Cash (only) Settlement	B	Next Day (only) Settlement				
Code	Value													
Space	Regular Way Settlement													
A	Cash (only) Settlement													
B	Next Day (only) Settlement													
Short Sale Restriction Indicator	1	<div>Char.</div> <div>Identifies whether or not a Short Sale Restriction is in effect. A Short Sale Restriction is to be in effect if a security’s price decreases by 10% or more from the previous day’s closing price. Once activated, the Short Sale Restriction will remain in effect for the remainder of the day as well as the following day, unless deactivated.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Short Sale Restriction Not in Effect</td></tr><tr><td>A</td><td>Short Sale Restriction Activated</td></tr><tr><td>C</td><td>Short Sale Restriction Continued</td></tr><tr><td>D</td><td>Short Sale Restriction Deactivated</td></tr><tr><td>E</td><td>Short Sale Restriction in Effect</td></tr></table>	Code	Value	Space	Short Sale Restriction Not in Effect	A	Short Sale Restriction Activated	C	Short Sale Restriction Continued	D	Short Sale Restriction Deactivated	E	Short Sale Restriction in Effect
Code	Value													
Space	Short Sale Restriction Not in Effect													
A	Short Sale Restriction Activated													
C	Short Sale Restriction Continued													
D	Short Sale Restriction Deactivated													
E	Short Sale Restriction in Effect													

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description						
SIP Generated Message Identifier	1	<p>Char.</p> <p>Identifies CQS as the originator of a message, used in instances when:</p> <ul style="list-style-type: none"><li>▪ CQS is the originator of a <b>republished</b> Quote message (used when CQS republishes the LULD and/or LULD BBO Indicators as a result of a <b>Price Band change</b>). When CQS republishes a Quote message, the Participant ID field in the Message Header will identify the Participant that initiated the <b>original</b> message.</li><li>▪ CQS is <b>the originator of a Price Band</b> message. The Participant ID field in the Message Header <b>and</b> the ‘SIP Generated Message Identifier’ field will both be populated with code ‘S’ identifying CQS as the originator of the message.</li></ul> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>SIP Generated Message Not Applicable</td></tr><tr><td>S</td><td>Consolidated Quotation System</td></tr></table>	Code	Value	Space	SIP Generated Message Not Applicable	S	Consolidated Quotation System
Code	Value							
Space	SIP Generated Message Not Applicable							
S	Consolidated Quotation System							

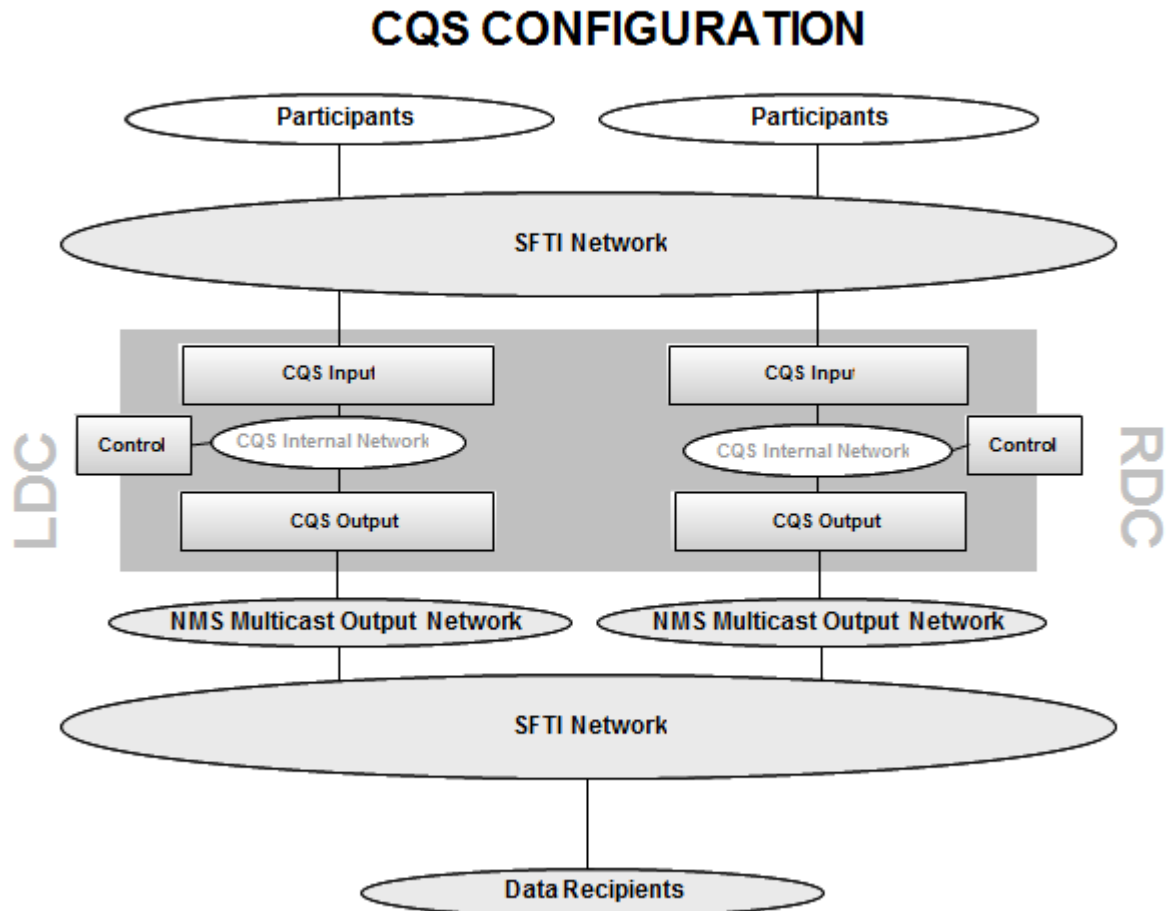
CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Timestamp 2	8	<p>2 x Integer (pair of Integers). Optional set to zero.</p> <p>Timestamp 2 is a FINRA Alternative Display Facility (ADF)-provided timestamp represented in nanoseconds since Epoch. The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315). If Timestamp 2 is not provided, this field will be set to zero. For any messages generated by CQS, e.g., messages generated on behalf of a Participant, Administrative messages and Control messages, the Timestamp 2 field will be set to zero.</p> <ul style="list-style-type: none"><li>▪ <b>If from an Exchange: Timestamp 2</b> field will be set to zero.</li><li>▪ <b>If from the FINRA Alternative Display Facility (ADF):</b><ul style="list-style-type: none"><li>▪ <b>If the FINRA ADF</b> provides a proprietary feed of its quotation information, then FINRA will publish the time of the quotation as also published on the facility's proprietary feed. FINRA shall provide such times to the Processor in nanoseconds since Epoch.</li><li>▪ <b>If the FINRA ADF</b> does <b>not</b> have a proprietary quotation feed then the Timestamp 2 field will be set to zero.</li></ul></li></ul>

**APPENDIX A: CQS CONFIGURATION**



CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**APPENDIX B: GLOSSARY**

Term	Description
Below Continuing Listing Standards	A financial status designation pertaining to Tape ‘A’ and Tape ‘B’ listed securities. The status identifies a company, whose issue is listed on the New York Stock Exchange, the NYSE American Stock Market or on one of the participating U.S. Stock Exchanges, and has failed to meet established listings standards. The listing exchange will subsequently review the appropriateness of continuing to list the issue, and may decide to commence the process of delisting the issue.
Cash (Only) Settlement	A security settling in cash all day on a participant or consolidated basis, such as a Common, Preferred or Right that is nearing expiration. Participants can elect to report different settlements in the same security during the day based on their own settlement requirements. For example, one participant can report quotes as cash (only) settlement while another participant can report quotes as regular or next day settlement.
Creations Suspended (For Exchange Traded Products)	A financial status designation used to denote the ability to create new shares of this Exchange Traded Product (ETP) has been temporarily suspended by the ETP Issuer. ETPs that are closed for Creations typically are allowed to continue trading on the listing market once the ETP Issuer publishes the press release.
Crossed Market	Indicates a Bid Price, which is greater than the Offer Price for a security for a quote. (Only applicable to Bonds.)
CTA Eligible Equity	Generally, any common stock, rights, long-term warrants or preferred stock which becomes registered on any national securities exchange or is admitted to unlisted trading privileges thereon and which at the time of such registration or at the commencement of such trading substantially meets the original listing requirements of the NYSE or the NYSE American Stock Market for such securities.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

---

**GLOSSARY**

Term	Description
Late Filing	A financial status designation pertaining to Tape ‘A’ and Tape ‘B’ issues (i.e. issues listed on the NYSE, the NYSE American Stock Market or on one of the participating U.S. Stock Exchanges). The status identifies a company, which has failed to meet established listings standards for filing its annual reports.
Limit Up-Limit Down (LULD) Price Band	<p>The Limit Up-Limit Down Price Band represents a price range which is set at a percentage level above and below the average price of a security over the immediately preceding five (5) minute period. Price Bands prevail for a minimum of thirty (30) seconds. During a Limit State Price Bands will not be disseminated and will recommence when Limit State is terminated.</p> <p>For further details related to Limit Up-Limit Down, reference the following: <a href="http://www.sec.gov/news/press/2011/2011-84.htm">http://www.sec.gov/news/press/2011/2011-84.htm</a></p> <p><b>Note1:</b> There are no sizes associated with LULD Price Bands. <b>Note2:</b> ‘Limit Up-Limit Down’ Price Bands are republished every 30 seconds at clock time.</p>
Limit Up-Limit Down (LULD) Trading Pause	Denotes a five-minute regulatory trading halt (pause) for an individual security that does not exit a Limit State within 15 seconds.
Limit State	Indicates that a National Best Bid is equal to the Upper Limit Price Band, or that a National Best Offer is equal to the Lower Limit Price Band.
Liquidation (For Exchange Traded Products)	A financial status designation used to denote that the ETP Issuer announced the ETP will be liquidated and NYSE ARCA announced the date the ETP will be suspended from trading.
Local Issue	A Local Issue is an issue that does <b>not</b> meet the NYSE American Stock Market or NYSE listing requirements (is not CTA eligible) but is traded at one or more participating U.S. Stock Exchanges.
Locked Market	Indicates an identical Bid and Offer Price for a security for a quote. (Only applicable to Bonds.)

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**GLOSSARY**

Term	Description
Market-Wide Circuit Breaker Level 1 – 7% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 7% decline level below its closing value on the previous trading day. A Level 1 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: before 3:25 p.m. ET – duration 15 minutes; at or after 3:25 p.m. ET – trading shall continue, unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.
Market-Wide Circuit Breaker Level 2 – 13% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 13% decline level below its closing value on the previous trading day. A Level 2 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: before 3:25 p.m. ET – duration 15 minutes; at or after 3:25 p.m. ET – trading shall continue, unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.
Market-Wide Circuit Breaker Level 3 – 20% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 20% decline level below its closing value on the previous trading day. A Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: at any time during regular trading hours, trading shall Halt and <u>not</u> Resume for the remainder of the trading day.
Next Day (Only) Settlement	Same definition as cash (only) settlement except settlement is next day.
Non-Regulatory Opening Delay or Trading Halt	An operational Opening Delay or Trading Halt for a Participant due to Order Imbalance, Order Influx or Operational.
Normal Auction Market	Where the quote bid price is less than the offer price for a security for a Participant.
On Demand Intra-Day Auction	This quote condition is used to provide additional clarity to the CQS Participants and allow them to take part in an auction which will enhance liquidity in the marketplace. It is anticipated that this quote condition will be input into CQS by Participants with a zero bid price, zero bid size, zero offer price, and zero offer size and disseminated over the CQS multicast output lines.
Opening Delay	Postponement of the opening of trading in a security for a Participant.



CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**GLOSSARY**

Term	Description
Price Indication	Reflects an approximate price range of what a security's trading range (bid and offer prices) will be when trading resumes after an Opening Delay or a Trading Halt.
Redemptions Suspended (For Exchange Traded Products)	A financial status designation used to denote the ability to redeem shares of this ETP has been suspended by the ETP Issuer. ETPs that are closed for redemption will remain halted on the listing market.
Regular Way Settlement	The settlement date is within three (3) business days following the date of the transaction.
Regulatory Opening Delay Or Trading Halt	An Opening Delay or Trading Halt in a particular security for a Participant in advance of a major news announcement and is noted with a News Dissemination or News Pending quote condition. In addition, Due To Related Security can be used in conjunction with a regulatory Delay/Halt Reason, i.e., News Dissemination or News Pending.
Republished Limit Up-Limit Down Price Band	Indicates that the Price Band being disseminated is a republication of the latest Price Band for a security.
Resume	This quote condition along with zero-filled bid, offer and size fields is used to indicate that trading for a Participant is no longer suspended in a security which had been Opening Delayed or Trading Halted.
Short Sale Restriction	A restriction designed to control short selling from further driving down the price of a security any day in which the price declines by 10% or more from the previous day's closing price. Once the Short Sale Restriction is activated, a Short Sale Restriction would be in effect in that security for the remainder of the day as well as the following day, unless deactivated.
Sub-Penny Trading	Indicates a non-regulatory Opening Delay or Trading Halt for a security whose price may fall below \$1.05, possibly leading to a sub-penny execution.
Trading Halt	Temporary halt in trading in a particular security for a Participant.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**APPENDIX C: SUMMARY OF DAILY CQS MULTICAST LINE MESSAGES**

Time Ranges shown have approximate end times indicated, are dependent on daily traffic volume and are subject to change based on a Participant's hours of operation. Times are represented in *Eastern Time* (ET).

Time (ET)	Transmission
01:40	Line Integrity Messages*
02:00	Start of Test Cycle Message
02:45	End of Test Cycle Message
03:30 – 3:32	Start of Day – Control Message (Sent three times at one minute intervals)
03:31 – 20:00	Administrative Messages Trading Range Indications Short Sale Restriction
03:33 – 20:30	Reset Block Sequence Number Message – Control Message Retransmission Messages Test Messages No Open/No Resumes Opening Delays/Trading Halts Price Indications Resumes
04:00 - 20:00	Market Status Messages Quote Messages Auction Status Messages
04:00	<i>OFFICIAL MARKET OPEN: NASDAQ &amp; NYSE ARCA</i>
07:00 (Iteration 1) 08:00 (Iteration 2)	Market-Wide Circuit Breaker (MWCB) Decline Level – Market Status Message
07:00	<i>OFFICIAL MARKET OPEN: Cboe BYX, Cboe BZX, Cboe EDGA, Cboe EDGX, CHX, NASDAQ OMX BX, NYSE American &amp; NYSE National</i>
08:00	<i>OFFICIAL MARKET OPEN: FINRA, IEX, NASDAQ OMX PSX</i>
09:30	<i>OFFICIAL MARKET OPEN: NYSE</i>
09:30 – 16:00	LULD Price Band Messages

*Line Integrity Messages are transmitted at intervals of approximately sixty (60) seconds throughout the day ending when the CQS multicast lines are brought down.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**APPENDIX C: SUMMARY OF DAILY CQS MULTICAST LINE MESSAGES, *continued***

<b>Time (ET)</b>	<b>Transmission</b>
16:00	<i>OFFICIAL MARKET CLOSED: NYSE</i>
16:03	Suspend Best Bid and Best Offer for: NYSE (BBO Group 0 Stocks)**
16:19	Suspend Best Bid and Best Offer for: NYSE (BBO Group 1 Stocks)**
16:33	Suspend Best Bid and Best Offer for: CHX
17:00	<i>OFFICIAL MARKET CLOSED: Cboe BYX, Cboe BZX, CHX, IEX &amp; NASDAQ OMX PSX</i>
17:03	Suspend Best Bid and Best Offer for: Cboe BYX, Cboe BZX (BBO Group 0 Stocks)
17:15	End of Participant Reporting for: CHX
17:19	Suspend Best Bid and Best Offer for: Cboe BYX, Cboe BZX (BBO Group 1 Stocks)**
17:30	End of Participant Reporting for: NYSE

** Suspend Best Bid and Best Offer (Suspend BBO) occurs for each Participant shortly after its market close. Participants can continue to send in quotes subsequent to the Suspend BBO, but these quotes will not be included in the BBO calculation. The Suspend BBO command removes the Participant from the BBO calculation and re-issues the last quote for that Participant as a closing quote if that quote was part of the BBO. A new BBO excluding that Participant is appended to the closing quote. However, each Participant has the option to continue quoting and remain in the BBO for a subset of securities past the market close. This subset of securities is assigned to BBO Group 1. All other issues are assigned to BBO Group 0. They are removed from the BBO for each Participant shortly after its market close.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**APPENDIX C: SUMMARY OF DAILY CQS MULTICAST LINE MESSAGES, *continued***

Time (ET)	Transmission
18:30	<i>OFFICIAL MARKET CLOSED: FINRA</i> End of Participant Reporting for: FINRA
18:45	End of Participant Reporting for: Cboe BYX
19:00	<i>OFFICIAL MARKET CLOSED: NASDAQ OMX BX</i> End of Participant Reporting for: NASDAQ OMX BX
20:00	End of Participant Reporting for: Cboe BZX, NYSE American & NYSE National
20:00	<i>OFFICIAL MARKET CLOSED: Cboe EDGA, Cboe EDGX, NASDAQ, NYSE American, NYSE National &amp; NYSE ARCA</i> End of Participant Reporting for: Cboe EDGA, Cboe EDGX, NASDAQ, NYSE ARCA, NYSE American & NYSE National
20:06	End of Day*** (sent three times at one minute intervals)

*** All CQS Participant Lines are brought down (Dependent on all Participants being closed).

**Afterhours Test Data Dissemination:**

- CQS Multicast Data Recipients are reminded that test data dissemination over CQS multicast data feeds can commence as early as **8:30 P.M. ET** and terminate as late as **3:25 A.M. ET** during business weekdays and any time during Saturdays, Sundays and Market holidays. This test period is accommodated to allow testing opportunities for Participants and Data Recipients, as well as to provide test time to rectify any production problems that may have occurred the prior business day. Multicast data feed recipients should take the necessary precautions to protect their systems against any adverse impact (e.g., database corruption) if processing data throughout the test dissemination period. During the test period, note that test data can be disseminated over all CQS multicast channels (e.g., Production, Retransmission or Playback Test Group IP addresses).

## **APPENDIX D: ADMINISTRATIVE MESSAGE TEXT SAMPLES**

The administrative message text examples provided are intended to be indicative of the kinds of Administrative messages, not necessarily limited to the number of examples shown, that can be transmitted.

### **Standard Message Sent Upon Detection of Delay:**

- ALERT ALERT ALERT THE CONSOLIDATED QUOTE SYSTEM IS EXPERIENCING A PROCESSING PROBLEM AS OF <TIME>. FURTHER INFORMATION TO FOLLOW

### **Example of Update Message on Status of Delay:**

- ALERT ALERT ALERT THE CONSOLIDATED QUOTE SYSTEM IS EXPERIENCING A REPORTING DELAY AFFECTING MULTICAST LINES <LINE NUMBER(S)>. FURTHER INFORMATION TO FOLLOW

### **Standard Message Sent Upon Return to Normal Reporting:**

- ALERT ALERT ALERT THE CONSOLIDATED QUOTE SYSTEM PROCESSING PROBLEM IS RESOLVED AS OF <TIME>, CQS IS PROCESSING NORMALLY

## **APPENDIX E: CQS CLOSING ROUTINE**

A Participant can individually close a security by sending in a closing quote to CQS. CQS disseminates this closing quote over the Multicast Line and appends a new NBBO, excluding that Participant, if that Participant was part of the current NBBO.

Participants in CQS are excluded from the NBBO calculation at the Participant's designated closing time. A Participant can have multiple closing times, on a per security basis, thus allowing inclusion of quotes in the NBBO calculation for those securities, which have not been closed. After a Participant is closed, CQS cycles through its database and disseminates a closing quote message using that Participant's last NBBO eligible quote for only those securities for which that Participant was part or all of the current NBBO. A Participant can continue to submit quotes for securities, which have been closed, however, the quotes will not be included in the NBBO calculations.

## APPENDIX F: NATIONAL BEST BID AND OFFER OVERVIEW

National Best Bid and Best Offer calculations are performed for each Market Center beginning at various times (between 4:00 a.m. and 9:30 a.m. ET) whenever a new qualifying quote is received after a Participant Market Open. If it is determined that the new quote or FINRA provided FBBO has caused a new National BBO, the appropriate National BBO information is appended to the new Short Quote, Long Quote or Special Long Quote (FINRA ADF) with FINRA BBO Information quote message. Appendages are not added if it is determined that the current quote does not affect the National BBO.

A new quote can be the entire new National BBO quote (both Bid and Offer). In addition, the National BBO and FINRA provided FBBO **can** indicate a Crossed Market where the Bid price is higher than the Offer price or a Locked Market where both the Bid and the Offer prices are the same.

CQS generates a National BBO based on the following criteria in this order:

- **Price** - Exchanges with highest Bid and lowest Offers have overall priority.
- **Size** - Largest size takes precedence when multiple Exchanges submit the same Bid and/or Offer price.
- **Time** - Earliest time takes precedence when multiple Exchanges submit the same Bid and/or Offer price with the same size.

## **APPENDIX F: NATIONAL BEST BID AND OFFER OVERVIEW, continued**

### **BBO Considerations**

There are several trading conditions that affect the calculations of a National BBO for a security, including:

#### **Non-Qualifying Quote Conditions**

If a quote with a non-qualifying quote condition is entered from a Participant which made up part or all of the current National BBO, CQS will calculate and append a new National BBO.

#### **Participant Overall Halt in Trading**

If a Participant were to halt trading in all securities during the trading day (due to computer failure, market shutdown, etc.), CQS, when instructed by the Participant, can send a 'Zero Quote' for only those issues in which that Participant had an outstanding BBO eligible quote. A new National BBO is calculated and, if necessary appends a new National BBO.

### **FINRA BBO**

FINRA provides a FINRA calculated FBBO and the FBBO is included in the National BBO calculations.

If part of the new FINRA BBO is also part of the new National BBO, the appropriate National BBO information is also appended to the Short Quote, Long Quote or Special Long Quote (FINRA ADF) with FINRA BBO Information message.



## APPENDIX G: QUOTE CONDITIONS

The quote condition determines whether a quote qualifies to be included in the calculation of the National BBO. The National BBO calculation is performed whenever a new qualifying quote with price and size filled Bid and/or Offer is received from a Participant. For quotes with BBO eligible quote conditions containing zero-filled price and size Bid and Offer information, the National BBO is recalculated excluding the Participant that transmitted the BBO eligible quote condition with zero-filled prices and sizes.

The quote conditions may be viewed as belonging to two classes:

1. Those that qualify for inclusion in the National Best Bid & Offer (BBO) calculations.
2. Those that do not qualify for inclusion in the National Best Bid & Offer (BBO) calculations.

### **BBO Eligible Quotes**

#### **Quote Condition A – Slow Quote on the Offer Side**

This condition indicates that the current offer is in ‘Slow’ quote mode. While in this mode, auto-execution is not eligible on the Offer side and can be traded through pursuant to anticipated Regulation NMS requirements.

#### **Quote Condition B – Slow Quote on the Bid Side**

This condition indicates that the current bid is in ‘Slow’ quote mode. While in this mode, auto-execution is not eligible on the Bid side and can be traded through pursuant to anticipated Regulation NMS requirements.

#### **Quote Condition E – Slow Quote due to Liquidity Replenishment Point (LRP) or Gap Quote on the Bid Side - Only OFFER SIDE is eligible for BBO**

This quote condition is used to indicate that the current Bid is in ‘Slow’ quote mode due to a Liquidity Replenishment Point (LRP) or Gap Quote. While in this mode, auto-execution is not eligible, the quote is then considered Slow on the Bid side and can be traded through, as per Regulation NMS.

## **APPENDIX G: QUOTE CONDITIONS**

### **BBO Eligible Quotes**

#### **Quote Condition F - Slow Quote due to Liquidity Replenishment Point (LRP) or Gap Quote on the Offer Side - Only BID SIDE is eligible for BBO**

This quote condition is used to indicate that the current Offer is in Slow quote mode due to a Liquidity Replenishment Point (LRP) or Gap Quote. While in this mode, auto-execution is not eligible, the quote is then considered Slow on the Offer side and can be traded through, as per Regulation NMS.

#### **Quote Condition H - Slow Quote on the Bid and Offer Sides**

This condition indicates that the quote is a 'Slow' quote on both the Bid and Offer sides. While in this mode, auto-execution is not eligible on the Bid and Offer sides, and either or both sides can be traded through pursuant to anticipated Regulation NMS requirements.

#### **Quote Condition O - Opening Quote**

This condition can be disseminated to indicate that this quote was the opening quote for a security for that Participant.

#### **Quote Condition R - Regular (for FINRA - Market Maker Open)**

This condition is used for the majority of quotes to indicate a normal trading environment. It is also used by the FINRA Market Makers in place of Quote Condition 'O' to indicate the first quote of the day for a particular security. The condition may also be used when a Market Maker re-opens a security during the day.

#### **Quote Condition W – Slow Quote Due to Set Slow List on both Bid and Offer Sides**

This quote condition is used to indicate that the quote is a Slow Quote on both the Bid and Offer sides due to a Set Slow List that includes High Price securities. While in this mode, auto-execution is not eligible, the quote is then considered Slow on the Bid and Offer sides and either or both sides can be traded through, as per Regulation NMS.

## **APPENDIX G: QUOTE CONDITIONS**

### **BBO Ineligible Quotes**

#### **Quote Condition C - Closing Quote**

This condition can be disseminated to indicate that this quote was the last quote for a security for that Participant.

#### **Quote Condition L - Market Maker Quotes Closed (FINRA)**

This condition is disseminated by each individual FINRA Market Maker to signify either the last quote of the day or the premature close of an individual Market Maker for the day. In the latter case, the Market Maker can re-open by transmitting a quote accompanied by the Quote Condition R.

#### **Quote Condition N - Non-Firm Quote**

This quote condition suspends a Participant's firm quote obligation for a quote for a security.

#### **Quote Condition U - Slow Quote due to Liquidity Replenishment Point (LRP) or Gap Quote on both the Bid and Offer Sides**

This quote condition is used to indicate that the quote is a Slow Quote on both the Bid and Offer sides due to a Liquidity Replenishment Point (LRP) or Gap Quote. While in this mode, auto-execution is not eligible, the quote is then considered Slow on the Bid and Offer sides, and either or both sides can be traded through, as per Regulation NMS.

#### **Quote Condition 4 – On Demand Intra-Day Auction**

This quote condition is used to provide additional clarity to the industry participants and to allow participants to take part in an auction which will enhance liquidity in the marketplace.

## **APPENDIX H: SECURITY STATUS INDICATORS**

In addition to the Quote Condition field determining whether a quote qualifies to be included in the calculation of the National BBO the Security Status field is also considered in the calculation of the National BBO. If the Security Status Indicator is populated with either a regulatory or a non-regulatory status (other than Market Wide Circuit Breaker Levels), it will result in the BBO being recalculated excluding the Participant from the BBO if that Participant was part or all of the BBO.

### **Security Status Indicator 1 – Market-Wide Circuit Breaker Level 1 – Breached**

This security status indicator is used to indicate that trading is suspended due to the S&P 500 Index reaching a 7% decline level below its closing value on the previous trading day. A Level 1 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: before 3:25 p.m. ET – duration 15 minutes; at or after 3:25 p.m. ET – trading shall continue, unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.

### **Security Status Indicator 2 – Market-Wide Circuit Breaker Level 2 – Breached**

This security status indicator is used to indicate that trading is suspended due to the S&P 500 Index reaching a 13% decline level below its closing value on the previous trading day. A Level 2 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: before 3:25 p.m. ET – duration 15 minutes; at or after 3:25 p.m. ET – trading shall continue, unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.

### **Security Status Indicator 3 – Market-Wide Circuit Breaker Level 3 – Breached**

This security status indicator is used to indicate that trading is suspended due to the S&P 500 Index reaching a 20% decline level below its closing value on the previous trading day. A Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: at any time during regular trading hours, trading shall Halt and not Resume for the remainder of the trading day.

### **Security Status Indicator D - News Dissemination**

This regulatory Opening Delay or Trading Halt is used when relevant news influencing the security is being disseminated. Trading is suspended until the primary market determines that an adequate publication or disclosure of information has occurred.

### **Security Status Indicator G - Trading Range Indication**

The trading range indication is used to denote the probable trading range (bid and offer prices, no sizes) of a security that is not Opening Delayed or Trading Halted. The Trading Range Indication is used prior to or after the opening of a security.

## **APPENDIX H: SECURITY STATUS INDICATORS**

### **Security Status Indicator I - Order Imbalance**

This non-regulatory Opening Delay or Trading Halt is used when there is a significant imbalance of buy or sell orders.

### **Security Status Indicator M – Limit Up-Limit Down (LULD) Trading Pause**

This regulatory Opening Delay or Trading Halt is used to indicate conditions in which a stock experiences a 10% or more change in price over a five minute period.

### **Security Status Indicator P - News Pending**

This security status indicator is used to indicate a regulatory Opening Delay or Trading Halt due to an expected news announcement, which may influence the security. An Opening Delay or Trading Halt may be continued once the news has been disseminated.

### **Security Status Indicator T - Resume**

This security status indicator along with zero-filled bid, offer and size fields is used to indicate that trading for a Participant is no longer suspended in a security which has been Opening delayed or Trading Halted.

### **Security Status Indicator X - Operational**

This non-regulatory Opening Delay or Trading Halt is used when the ability to trade a security by a Participant is temporarily inhibited due to technical reasons.

### **Security Status Indicator Y – Sub-Penny Trading**

This non-regulatory Opening Delay or Trading Halt is used to indicate an Opening Delay or Trading Halt for a security whose price may fall below \$1.05, possibly leading to a sub-penny execution.

### **Security Status Indicator Z - No Open/No Resume**

This security status indicator is used to indicate that an Opening Delay or a Trading Halt is to be in effect for the rest of the trading day in a security for a Participant.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

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**APPENDIX I: SYMBOL SUFFIXES EXAMPLES**

	<b>Suffix</b>	<b>Description</b>
<b>A</b>	.A	Series (or Class) <b>A</b> - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	.A.CL	Series <b>A</b> Called - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	.A.CV	Series <b>A</b> Convertible - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	.Aw	Series <b>A</b> When Issued - <i>Also</i> Series <b>B-T &amp; V-Z</b>
<b>C</b>	.CL	Called
	.CT	Certificates
	.CV	Convertible
	.CVR	Contingent Value Right
	.CV.CL	Convertible Called
<b>D</b>	.DP	Amount of most recent dividend to go 'ex- distribution'
	.DV	Accumulated dividend per share net expenses, through and including the previous day's close of trading
<b>E</b>	.EC	EMERGING COMPANY MARKETPLACE SM
	.EU	Estimated cash amount per creation unit
<b>F</b>	.F.N	Foreign News
<b>I</b>	.ID	Index – differentiates an index from a stock with the same root symbol
	.IV	Intra-Day Net Asset Value per share
<b>M</b>	.MN	Mini
<b>N</b>	.NV	Net Asset Value per share as at the close on the previous day's close of trading
<b>P</b>	.PO	Percent Paid
	.PP	Partial Paid
	.PT.CL	Part Called
	p	Preferred
	pA	Preferred Series <b>A</b> - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	pA.CV	Preferred Series <b>A</b> Convertible - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	pA.CL	Preferred Series <b>A</b> Called - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	pAw	Preferred Series <b>A</b> When Issued - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	pw	Preferred When Issued
	p.CL	Preferred Called
	p.CV	Preferred Convertible

## APPENDIX I: SYMBOL SUFFIX EXAMPLES

	Suffix	Description
<b>P</b>	p.CV.CL	Preferred Convertible Called
	p.WD	Preferred When Distributed
	p.CA	Indicates Class <b>A</b> of a Second Category of Preferred - <i>Also</i> Class <b>B-K</b> and <b>M-S</b>
<b>R</b>	r	Rights
	rw	Rights When Issued
<b>S</b>	.SC	Small Corporate - Offering Registration
	.SD	Stamped
	.SM	Mini Settlement
	.SO	Current shares outstanding in thousands
	.SP	Special
	.SV	Settlement
<b>T</b>	.TC	Total cash amount per creation unit
	.TT	Tier II Securities
<b>U</b>	.U	Units – (A combination of securities composed of two or more warrants, common stocks, preferred stocks and/or bonds.)
<b>V</b>	.VR	Variable Common Right
<b>W</b>	.WD	When Distributed
	w	When Issued
	.WS	Warrants
	.W.WS	With Warrants
	.WS.A	Warrants Series <b>A</b> - <i>Also</i> Series <b>B-T</b> & <b>V-Z</b>
	.WSw	Warrants When Issued

**Note:**

- Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.
- Suffixes start with one of the following characters with no embedded spaces: a) ASCII Period (‘.’); b) Lower case ‘p’; c) Lower case ‘r’; d) Lower case ‘w’.

CONSOLIDATED QUOTATION SYSTEM (CQS)  
MULTICAST OUTPUT BINARY SPECIFICATION

**APPENDIX J: ASCII PRINTABLE TABLE (Character Code 32-126)**

ASCII	DEC	Description
<space>	32	Space
!	33	Exclamation
"	34	Double quotes
#	35	Number
\$	36	Dollar
%	37	Percent
&	38	Ampersand
'	39	Single Quote
(	40	Open Parenthesis
)	41	Close Parenthesis
*	42	Asterisk
+	43	Plus
,	44	Comma
-	45	Hyphen
.	46	Period
/	47	Slash or Divide
0	48	Zero
1	49	One
2	50	Two
3	51	Three
4	52	Four
5	53	Five
6	54	Six
7	55	Seven
8	56	Eight
9	57	Nine
:	58	Colon
;	59	Semicolon
<	60	Less than
=	61	Equals
>	62	Greater than
?	63	Question mark
@	64	At symbol
A	65	Uppercase A
B	66	Uppercase B
C	67	Uppercase C
D	68	Uppercase D
E	69	Uppercase E
F	70	Uppercase F
G	71	Uppercase G
H	72	Uppercase H
I	73	Uppercase I
J	74	Uppercase J
K	75	Uppercase K
L	76	Uppercase L
M	77	Uppercase M
N	78	Uppercase N
O	79	Uppercase O
P	80	Uppercase P

ASCII	DEC	Description
Q	81	Uppercase Q
R	82	Uppercase R
S	83	Uppercase S
T	84	Uppercase T
U	85	Uppercase U
V	86	Uppercase V
W	87	Uppercase W
X	88	Uppercase X
Y	89	Uppercase Y
Z	90	Uppercase Z
[	91	Opening bracket
\	92	Backslash
]	93	Closing bracket
^	94	Caret
_	95	Underscore
`	96	Grave accent
a	97	Lowercase a
b	98	Lowercase b
c	99	Lowercase c
d	100	Lowercase d
e	101	Lowercase e
f	102	Lowercase f
g	103	Lowercase g
h	104	Lowercase h
i	105	Lowercase i
j	106	Lowercase j
k	107	Lowercase k
l	108	Lowercase l
m	109	Lowercase m
n	110	Lowercase n
o	111	Lowercase o
p	112	Lowercase p
q	113	Lowercase q
r	114	Lowercase r
s	115	Lowercase s
t	116	Lowercase t
u	117	Lowercase u
v	118	Lowercase v
w	119	Lowercase w
x	120	Lowercase x
y	121	Lowercase y
z	122	Lowercase z
{	123	Opening Brace
	124	Vertical Bar
}	125	Closing Brace
~	126	Equivalency Sign-Tilde



## **CQS Multicast Output Binary and ASCII Protocol Differences and Notes**

### **General:**

1. Transmission block SOH & ETX have been removed.
2. 'Block Pad Byte' added to ensure blocks are an even number of bytes. Updated 'Block Pad Byte' description to include binary representation.
3. Data Type (format) modified to support Big Endian (network byte order) and ASCII printable character codes 32-126 inclusive.
4. Message Category and Type Codes harmonized where applicable.
5. Reorganization of fields within message formats for consistency purposes.
6. 'Instrument Type' in message formats will identify CTA Eligible Equity, Local Issue and Bonds.
7. 'Primary Listing Market Participant ID' will explicitly identify the Listing Market associated with their listed security.
8. All Times (e.g., Timestamps, Date and Time) will be represented in nanoseconds from Epoch 1/1/1970, 00:00:00 UTC.
9. Short Prices will have 2 decimal places implied and Long Prices will have 6 decimal places implied.
10. The Symbol Suffix delimiter has been modified from '/' to '.' for input/output consistency.
11. The .TEST suffix support associated with the 'Test Message Indicator' has been replaced by dedicated Test Symbols.
12. Introduced alphanumeric dedicated Test Symbols consisting of two leading numeric associated with the Multicast line routing followed by an alphabetic character designating the Primary Listing Market for the dedicated Test Symbol.
13. 'Due to Related Security' and 'In View of Common' processing has been removed.
14. 'Currency Indicator' removed as currency is continuously US Dollars.
15. 'Reserved' fields removed from most message formats, future new fields will be accommodated using 'Version' updates.
16. 'Timestamp 2' has been moved from Message Header to applicable message formats.
17. 'CBSX' has withdrawn its status as a CTA Participant and has been removed.
18. Cancel/Correction Indicator field previously removed in Binary Version 1.0 however omitted in differences and notes.
19. Quote Condition 'Q' – Undefined previously removed in Binary Version 1.0 however omitted in differences and notes.
20. The 'Temporary Suffix' field has been removed.
21. Message routing reverted to current Production message routing.
22. Message Header and Message Body lengths decreased/increased to account for the elimination or addition of fields.
23. Signed Integer Data Type representation description has been added.
24. Minor clarification throughout document/removed verbiage associated with eliminated functionality.
25. Added CBOE Stock Exchange, Inc. (CBSX).
26. NYSE MKT was renamed to NYSE American.

## Differences and Notes, continued

### New Block Header:

1. 'Version' to facilitate support of current and future format changes.
2. 'Block Size' to indicate the size in bytes of the entire transmission block.
3. 'Block Sequence Number' to identify the block sequence number for each block with rollover occurring after 999,999,999 (a future enhancement will increase the number to 3,999,999,999; moved from Message Header to Block Header).
4. 'Messages in Block' to identify the number of messages contained in the transmission block.
5. 'Block Checksum' to identify sum of all the bytes in the block.
6. 'Data Feed Indicator' to identify CQS as the data feed.
7. 'Retransmission Indicator' reduced to 1 byte, moved from Message Header to Block Header and modified code from 'R' back to 'V' to indicate Retransmission.
8. 'SIP Block Timestamp' moved from Message Header to Block Header.
9. Modified order of field appearances in Block Header.

### Modified Message Header:

1. 'Message Network' (e.g., Network E/F) has been removed as network can be identified by the Multicast IP addresses.
2. 'Retransmission Indicator' moved from Message Header to Block Header.
3. 'Message Header Identifier' replaced by 'Version' in Block Header.
4. 'Transaction ID Part A and Part B' have been redefined as follows:
  - a. 'Transaction ID' (previously Transaction ID Part A) is for internal SIP use only.
  - b. 'Participant Reference Number' (previously Transaction ID Part B) replaces the use of 'Output Sequence Number' for correction and cancel/error processing.
5. 'Message Sequence Number' renamed to 'Block Sequence Number' moved from Message Header to Block Header.
6. 'SIP Block Timestamp' moved from Message Header to Block Header.
7. 'Timestamp 2' moved to applicable message formats.  
'Message ID' added to identify the message within the Block.
8. National BBO Indicator moved from Message Header to Quote Message formats (Short Quote/Long Quote/Special Long FINRA).
9. 'Message Length' field has been added.
10. 'Reserved' field has been removed.
11. 'Transaction ID' data Type modified.
12. Message Header length increased.
13. Modified order of field appearances.

### Administrative Messages:

1. 'Administrative message textual length increased to 900 characters.
2. 'Text Length' originally added to identify the length of the text in the Administrative message has been eliminated as 'Message Length' field added to Message Header.
3. Usage of YYY and ZZ begin announce and end announce characters removed.

### Control Messages:

1. Renamed Category C Type Z from 'End of Transmission' to 'End of Day'.

## Differences and Notes, continued

### Quote Messages:

#### Short Quote Format:

1. 'Instrument Type' implied CTA eligible Equity only, 'Quote Condition' is implied Regular, 'Settlement Condition' is implied Regular Way and 'Market Condition' is implied Normal Auction Market.
2. Added 'Primary Listing Market Participant ID'.
3. Added National BBO Indicator field, increased total message length.

#### Long Quote Format:

1. 'Quote Condition' split into two fields (Quote Condition - quote specific (e.g., regular) and Security Status – trading status specific (e.g., Trading Halts, Price Indications, etc.).
2. New 'FINRA BBO Indicator' to denote FINRA BBO status. FINRA will provide calculated FINRA Best Bid and Best Offer (FBBO) to CQS.
3. Added National BBO Indicator field, increased total message length.
4. Removed Temporary Suffix field.

#### New Special Quote Message Category/Type:

1. Introduced 'Special Long Quote (FINRA ADF) with FBBO Information message for FINRA only to identify the FINRA Best Bid and Best Offer at the Bid and/or Offer side for their Market Makers.
2. Added National BBO Indicator field, increased total message length.
3. Removed Temporary Suffix field.

#### New Auction Status Message Category/Type:

1. Introduced 'Auction Status' message to be transmitted when a Participant in a CTA eligible security, Local Issue or a Bond reports required Auction Information.
2. Added new Auction Status message field descriptions.

### Appendages:

#### Short National Best Bid and Best Offer (NBBO) Appendage:

1. 'Quote Condition' is implied 'Regular'.
2. Short NBBO Appendage supports separate Best Bid and Best Offer Appendages.
3. Added NBBO Indicators to include variations of Best and No Best Bids/Offers.
4. Added clarification on appearance of Bid /Offer Appendages specifically Bid Appendage appears before Offer Appendage when applicable.

#### Long National Best Bid and Best Offer (NBBO) Appendage:

1. Added Best Bid Quote Condition and Best Offer Quote Condition.
2. Long NBBO Appendage supports separate Best Bid and Best Offer Appendages.
3. Added NBBO Indicators to include variations of Best and No Best Bids/Offers.
4. Added clarification on appearance of Bid /Offer Appendages specifically Bid Appendage appears before Offer Appendage when applicable.

**Differences and Notes, continued**

**FINRA Best Bid and Best Offer (FBBO) Appendage:**

1. Removed FINRA BBO Appendage and replaced with new Category Q Type S Special Long Quote (FINRA ADF) with BBO Information message.