

# CQS Pillar Snapshot Specification

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#### **REFERENCE MATERIAL**

For CTA Technical Specifications visit <u>www.ctaplan.com</u> - and select Technical tab for the following:

- CQS Multicast Output Specification
- CTS Multicast Output Specification
- Common IP Multicast Distribution Network Specification
- Retransmission and Snapshot User Guide

#### **FURTHER INFORMATION**

• For CTA Announcements including feed enhancements, traffic rates, etc. visit <u>www.ctaplan.com</u>

#### **FUTURE ENHANCEMENTS**

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

#### **RELATED RESOURCES**

For Data Subscriber selecting to initiate connections through ICE Global Network (IGN) or NMS Network:

- Submit a request at: <u>https://www.theice.com/contact-us/connectivity</u>
- Contact IGN Sales at: <u>clientnetworks@theice.com</u>
- For more information on IGN, including documentation such as Customer and Technical guides reach out to an IGN representative at: <u>iceglobalnetwork-info@theice.com</u>

### **1.0 Introduction**

The CQS Snapshot service provides direct data feed subscribers the current state of NYSE, NYSE American, NYSE Arca and CBOE BZX listed securities. This will allow the multicast data feed subscriber to quickly recover from a failure scenario as a supplement to using the existing retransmission functionality for all messages in the CQS and CTS multicast feeds. New Consolidated and Participant Snapshot messages will be introduced to provide the current state of the active Security Symbols for the trading day.

### 1.1 Overview

- The existing CTA Retransmissions facility will be enhanced to support CQS Snapshot message requests
- Data Subscribers can use their existing retransmission input connections for requesting the Snapshot. Refer to the **Retransmission and Snapshot User Guide** for further details on how to Request a Snapshot.
- Snapshot can be requested per Symbol, per CQS Outbound Line or for the full system.
- New Message Formats will be used to provide Snapshot information. Existing CQS real-time output message formats are not used for Snapshot.
- All Snapshot messages will be published over a new set of output multicast lines
- Snapshot messages will be available upon request only (e.g., those will not be disseminated every 30 seconds like the LULD Price Band refreshes)
- Snapshot requests will be available during the operational hours, between 1:30 AM 8:05 PM, ET.
- Snapshot messages will not be available for retransmission.

### 1.2 Data Supported via Snapshot

Snapshot messages will contain the following Symbol State and Quote information:

- Currently Halted/ Limit Up-Limit Down (LULD) trading paused securities
- Short Sale Restrictions for eligible securities
- Auction Collar information for securities that are currently in a LULD pause state
- Latest LULD Price Bands for eligible securities
- Market Wide Circuit Breaker (MWCB) Level messages
- Latest Quote from each Participant and latest FINRA BBO
- National Best Bid and Offer (NBBO)
- Security Symbol information such as Primary Listing Market Participant ID and Financial Status Indicator for eligible securities
- Last Sale and other trade related information will not be available

### **1.3** Message Routing

Snapshot messages will be published over Snapshot output multicast lines. Publication of Snapshot messages will follow the same twenty-four IP multicast line routing which is used for the real-time CQS Production lines. Refer the CQS Multicast Output Binary Specifications for symbol distribution details.

### 2.0 Transmission Characteristics

### 2.1 Transmission Block

Encapsulated within each IP packet is a single transmission block. Each Block can have a maximum of 1,000 bytes inclusive of Block Header, Block Data, and Block Pad Byte.

Block Structure	Length
Block Header	24
Block Data	Variable
Block Pad Byte (optional)	1

- Block Header on the Snapshot stream has a different version than the Block Header on the Real-Time Production and Retransmission data. Refer to section 2.3 for Block Header Format
- The Block Data consists of one or more Snapshot messages. Each message consists of a Message Header and Message Data (body) of fixed length and format. Refer section 3.0 for Message Formats
  - Each Block will contain data for only one symbol. Multiple Blocks may be transmitted to provide Snapshot for one symbol, however messages for two distinct symbols will not be included in a same block
- Block Pad Byte is unsigned integer and contains binary zero (Hex 0x00). When the size of a block consists of an odd number of bytes, the Block Pad Byte is added to ensure the Block is an even number of bytes

### 2.2 Data Types

The following data types are used for Snapshot messages:

Туре	Description			
NUMERIC – Big-Endian (Network Byte Order)				
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			
signed long	Big-Endian Signed 8 Byte Integer			
ALPHA/ALPHANUMERIC/SPECIAL/PRINTABLE				
char	Single printable ASCII character			
char []	Fixed length printable ASCII characters			

- All numeric fields will be in Big-Endian (Network Byte Order) format
- Prices represented by long fields have implied 6 decimal places
- Any numeric field that is unused or does not apply to a given message has a value set to 0
- All alpha fields are ASCII fields which are left justified and padded on the right with spaces.

#### 2.3 Block Header

Field	Length	Туре
Version	1	Byte
Block Size	2	Short
Block Sequence Number	4	Integer
Messages In Block	1	Byte
DeliveryFlag	1	Byte
LastSeqNum	4	Integer
TotPubSeqRollover	1	Byte
SIP Block Timestamp	8	2 x Integer
Block Checksum	2	Short
Total Length	24	

#### 2.3.1 Version

1 Byte, unsigned integer. Indicates the Snapshot protocol version. Version value is set to 11 for current version on Snapshot messages

Note - Block Header Version on the real-time Production output messages is set to 2

#### 2.3.2 Block Size:

2 Bytes, unsigned integer. Indicates the size in bytes of entire transmission block

#### 2.3.3 Block Sequence Number:

4 Byte, unsigned integer. The Block Sequence Number denotes the sequence number of the first message in the block. Block Sequence Number for the Snapshot stream will start from 1, thereby incrementing for subsequent Snapshot messages. If a Block contains more than one message, any messages following the first message are implicitly numbered sequentially. As such, the Block Sequence Number in the next Block is incremented by the number of messages published in the previous Block.

In case CTA experiences a failure and recovery, Block Sequence number for messages for a subsequent Snapshot request can start from 1.

#### 2.3.4 Messages In Block:

1-byte, unsigned integer. The number of messages contained in the transmission block

#### 2.3.5 Delivery Flag:

1 Byte, unsigned integer. Delivery Flag field in the Block Header is used to identify all messages associated with a specific Snapshot request. Field can have following values:

- 1 First Block of Snapshot sequence
- 2 Intermediate Block of Snapshot sequence
- 3 Last Block of Snapshot sequence
- 4 Only one Block in Snapshot sequence

#### 2.3.6 LastSeqNum:

4 Byte, unsigned integer. It indicates the as-of Message Sequence Number for the Symbol published on the Production Output line

- Snapshot messages for each subsequent symbol published as part of same Snapshot request can have higher LastSeqNum number than the LastSeqNum for the previous symbols
- To maintain a real-time feed, Data Subscribers should process real-time CQS messages beginning with the next message sequence number, after the one reflected in the Snapshot message, per symbol

#### 2.3.7 TotPubSeqRollover

1 Byte, unsigned integer. Indicates the number of times the sequence number has previously rolled over for the Real-Time Output line on which the symbol resides

#### 2.3.8 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.

#### 2.3.9 Checksum

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

### 2.4 Message Header

The Message Header uniquely identifies the Category and Type of each message within a Block. Message Header for the Snapshot messages is different from the Message header for the Real-Time Production and Retransmission messages. The Message Header contains the following bytes and conforms in all cases to the following data fields:

Field	Length	Туре
Message Length	2	Short
Message Category	1	Char
Message Type	1	Char
Participant ID	1	Char
Total Length	5	

#### 2.4.1 Message Length

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

#### 2.4.2 Message Category and Types Table

#### 2.4.2.1 Message Category

Char. The Message Category represents the message classification.

#### 2.4.2.2 Message Type

Char. The Message Type together with the Message Category identifies the message.

Message Category	Message Type	Value
R	Т	Line Integrity Message
R	K	Market-Wide Circuit Breaker Decline Level Status Snapshot Message
R	С	Consolidated Snapshot Message
R	Р	Participant Snapshot Message
R	F	FINRA Snapshot Message

### 2.4.3 Participant ID

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

Code	Value
А	NYSE American, LLC (NYSE American)
В	NASDAQ OMX BX, Inc. (NASDAQ OMX BX)
C	NYSE National, Inc. (NYSE National)
D	FINRA Alternative Display Facility (ADF)
Н	MIAX Pearl Exchange, LLC (MIAX)
Ι	International Securities Exchange, LLC (ISE)
J	Cboe EDGA Exchange, Inc. (Cboe EDGA)
K	Cboe EDGX Exchange, Inc. (Cboe EDGX)
L	Long-Term Stock Exchange, Inc. (LTSE)
М	NYSE Chicago, Inc. (NYSE Chicago)
N	New York Stock Exchange, LLC (NYSE)
Р	NYSE Arca, Inc. (NYSE Arca)
S	Consolidated Quotation System
Т	NASDAQ Stock Market, LLC (NASDAQ)
U	Members Exchange, LLC (MEMX)
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)

### 3.0 Message Format

Each message consists of a Message Header and Message Body, or Message Header only. The Message Category and Message Type field in the Message Header identify the Message and determine the format of the body. All Snapshot message formats have fixed fields.

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

### 3.1 Line Integrity Message – Category R Type T

The Line Integrity message consists of the Message Header only; and is not blocked with any other Messages. It is transmitted over the multicast lines at intervals of ten (10) 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 Sequence Number of the last transmitted message.

In case CTA experiences a failure and recovery, the Block Sequence number for subsequent Line Integrity messages can start from 1.

### 3.2 Market-Wide Circuit Breaker Decline Level Status Snapshot Message -Category R Type K

The Market-Wide Circuit Breaker Decline Level Status Snapshot 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.

Note:

- MWCB levels are index values (not prices) and have implied *6* decimal places.
- The Market-Wide Circuit Breaker Decline Level Status Snapshot Message are disseminated by CQS on a daily trading day basis at approximately 7:00 am and at 8:00 am ET. If Snapshot is requested prior to such time, this message will not be available on the Snapshot
- The Market-Wide Circuit Breaker Decline Level Status Snapshot Message will be disseminated in a separate block

Field Name	Length	Туре
MWCB Level 1	8	Signed Long
MWCB Level 2	8	Signed Long
MWCB Level 3	8	Signed Long
Reserved	1	TBD
Total Length	25	

### **3.3** Consolidated Snapshot Message - Category R Type C

The Consolidated Snapshot message is a SIP Generated Message used to report the following information for each Security Symbol:

- Latest LULD Price Bands
- Auction Information for Securities in LULD Trading Pause
  - Auction collar information is provided only if the security is in a LULD halt at the time Snapshot is requested
  - Primary Listing Markets may submit multiple Auction Status messages while a security is in LULD halt (first message upon halt, subsequent ones upon each extension). Snapshot message will only provide the latest Auction collar details in the related fields
- National Best Bid and Offer (NBBO)
  - Note Field 'National BBO Indicator' is not used to provide NBBO information in the Snapshot. Consolidated Snapshot message contains the latest NBBO for the symbol at the time of publishing the Snapshot
  - NBBO will not be populated if no NBBO eligible Participant Quote exists for a security
- National BBO LULD Indicator
- Short Sale Restriction Indicator if SSR is in-effect
- Halt Reason if Listing Exchange is in a Halt/ LULD trading pause
  - Consolidated Snapshot message is used to report a Halt from Listing Exchange
  - Note If a security had Halted and Resumed prior to the Snapshot Request, Halt information is not included in the Consolidated Snapshot Message
- Primary Listing Market Participant ID
- Financial Status Indicator

Field Name	Length	Туре
Security Symbol	11	Char []
Instrument Type	1	Char
Lower Limit Price Band	8	Long
Upper Limit Price Band	8	Long
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
National Best Bid Participant ID	1	Char
National Best Bid Quote Condition	1	Char
National Best Bid Price	8	Long
National Best Bid Size	4	Integer
FINRA Best Bid Market Maker ID		Char []
National Best Offer Participant ID		Char
National Best Offer Quote Condition	1	Char
National Best Offer Price	8	Long
National Best Offer Size	4	Integer
FINRA Best Offer Market Maker ID	4	Char []
National BBO LULD Indicator	1	Char
Primary Listing Market Participant ID	1	Char
Financial Status Indicator	1	Char
Short Sale Restriction Indicator	1	Char
Halt Reason	1	Char
Reserved (for future use)	3	TBD
Total Length	97	

Note: A Consolidated Snapshot Message for each Security Symbol is published after all the Participant Snapshot Messages for that Symbol

### 3.4 Participant Snapshot Message - Category R Type P

The Participant Snapshot message is a SIP Generated Message used to report the following information for each Security Symbol:

- Latest Participant quote per symbol
  - Note National Best Bid and Offer (NBBO) information is not included in the Quote information published via Participant Snapshot Message. NBBO calculated based on all latest Participant quotes is included in the Consolidated Snapshot message
- Limit Up-Limit Down (LULD) Indicator for the quotes
- Price and Trading Range Indications, as applicable
  - Note When the field 'Halt Reason' is populated, High/Low Indication Price fields represent a Price Indication, otherwise High/Low Indication Price fields represent a Trading Range Indication
- Halt Reason per Participant, if any Exchange is currently in a Halt state
  - Participant Snapshot message is used to report per Participant Halt Reason Code (non-Listing exchanges can submit a non-Regulatory Halt)
  - Note If a Participant had Halted and Resumed prior to the Snapshot Request, Halt information is not included in the Consolidated Snapshot Message

Field Name	Length	Туре
Security Symbol	11	Char []
Quote Condition	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
Limit Up-Limit Down (LULD) Indicator	1	Char
High Indication Price	8	Long
Low Indication Price	8	Long
Halt Reason	1	Char
Total Length	57	

Note - If there is no Snapshot information available for any individual Participant, the Participant Snapshot Message may not be published for the security symbol for that Participant

### 3.5 FINRA Snapshot Message - Category R Type F

The FINRA Snapshot message is a SIP Generated Message used to report FINRA Best Bid and Offer (FBBO). If FINRA BBO is not available, FINRA BBO Snapshot message may not be published.

Field Name	Length	Туре
Security Symbol	11	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 []
FINRA BBO LULD Indicator	1	Char
High Indication Price	8	Long
Low Indication Price	8	Long
Halt Reason	1	Char
Total Length	63	

## 4.0 Field Description

Field Name	Length	Description
Auction Collar Reference Price	8	Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optionally set to zero.
		The Auction Collar Reference Price represents the price used by the exchange to establish the Auction Collar.
Auction Collar Lower Threshold Price	8	Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optionally set to zero.
		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.
Auction Collar Upper Threshold Price	8	Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optionally set to zero.
		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.
Bid Price	8	8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optionally set to zero.
		Represents the highest price a prospective buyer is prepared to pay at a particular time for a security.
Bid Size	4	4 Integer. Integer has a maximum size of 4,294,967,295 Optionally set to zero.
		The Bid Size identifies the number of round-lots, for a security.
		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.

Field Name	Length	Description					
Financial Status Indicator	1	Char.					
		Identifies th	ne financial status of the security.				
		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)				
		А	Liquidation (for Exchange Traded Products)				
Indicator		Indicates the affect that the Limit Up-Limit Down Price Bands have on the FINRA Best Bid and FINRA Best Offer (FBBO).					
		Code Value					
		Space	Limit Up-Limit Down Not Applicable				
		A	FINRA Best Bid <u>and/or</u> FINRA Best Offer are Executable				
		В	FINRA Best Bid outside Price Band – FINRA Best Bid is Non-Executable				
		С	FINRA Best Offer outside Price Band – FINRA Best Offer is Non-Executable				
		D	FINRA Best Bid <u>and</u> FINRA Best Offer outside Price Band – FINRA Best Bid <u>and</u> FINRA Best Offer are Non-Executable				
FINRA Best Bid Market Maker ID	4	Char [4]. Left justified, space filled. Contains the FINRA ADF provided FINRA Best Bid Market Maker identifier of the Market Maker that had the FINRA Best Bid (FBBO).					

Field Name	Length	Description
FINRA Best Bid Price	8	<ul><li>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</li><li>Optionally set to zero.</li><li>Contains the FINRA ADF provided FINRA Best Bid Price that is</li></ul>
ENDA Dest Did Ousts	1	the FINRA Best Bid (FBBO).
FINRA Best Bid Quote Condition	1	Char. Space-filled. Contains the FINRA ADF 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 Optionally set to zero.
		Contains the FINRA ADF provided FINRA Best Bid Size associated with the FINRA Best Bid Price that had the FINRA Best Bid (FBBO). It is identified as the number of round-lots for a security.
FINRA Best Offer Price	8	<ul> <li>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</li> <li>Optionally set to zero.</li> <li>Contains the FINRAADF provided Best FINRA Offer Price that is the FINRA Best Offer (FBBO).</li> </ul>
FINRA Best Offer Size	4	Integer. Integer has a maximum size of 4,294,967,295 Optionally set to zero.
		Contains the FINRA ADF provided FINRA Best Offer Size associated with the FINRA Best Offer Price that had the FINRA Best Offer (FBBO). It is identified as the number of round-lots for a security.
FINRA Best Offer Market Maker ID	4	Char [4]. Left justified, space filled.
		Contains the FINRA ADF provided FINRA Best Offer Market Maker identifier of the Market Maker that had the FINRA Best Offer (FBBO).
FINRA Best Offer Quote	1	Char. Space-filled.
Condition		Contains the FINRA ADF provided FINRA Best Offer Quote Condition associated with the Best FINRA Offer Price that had the FINRA Best Offer (FBBO).

Field Name	Length	Des	Description						
Halt Reason	1	Cha	Char.						
		Denotes the reason for the Trading Halt.							
			Code	Value	Regulatory	Non- Regulatory			
			Space	Halt Reason Not Applicable					
			А	Additional Information Requested	Х				
			С	Regulatory Concern	X				
			D	News Released (formerly News Dissemination)	X				
			Е	Merger Effective	X				
			F	ETF Component Prices Not Available	X				
			Ι	Order Imbalance		Х			
			М	Limit Up-Limit Down (LULD) Trading Pause	X				
			Ν	Corporate Action	Х				
			0	New Security Offering	Х				
			Р	News Pending	Χ				
			V	Intraday Indicative Value Not Available	X				
			Х	Operational		Х			
			Y	Sub-Penny Trading		Х			
			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	Х				
High Indication Price	8	\$18		have implied 6 decimal places and a ma 073,709.551615. t to zero.	ximun	n price of			
		high for a	a end 'Off a security	ication Price represents an approximatio er' price of a security's trading range m that is not Trading Halted, i.e., Trading following a Trading Halt, i.e., Price Ind	ay be. Range	It is used			

Field Name	Length	Description						
Instrument Type	1	Char.						
		Identifies th	Identifies the instrument type relevant to the quote.					
			Code	Value				
			0	CTA Eligible Equity				
			1	Local Issue				
			2	Corporate Bond	_			
			3	Government Bond				
Limit Up-Limit Down (LULD) Indicator	1	<ul><li>Char.</li><li>Indicates the affect the Quote has on the Limit Up-Limit Dov Band range.</li><li>An Offer Price that is below the Lower Limit Price Band, or a Price that is above the Upper Limit Price Band is identified a follows:</li></ul>						
		Code		Value				
		Space	Limit Up-Limit Down Not Applicable					
		А	Bid Price above Upper Limit Price Band – Bid is Non-Executable					
		В		below Lower Limit Price Band n-Executable				
		Note 1: If a Bid or an Offer is marked as Non-Executabl qualify for inclusion in the BBO calculations. Note 2: Limit Up-Limit Down' is not applicable to Local Bonds.						
Lower Limit Price Band	8		blied 6 decim 4,073,709.5516	nal places and a maximum 115.	price of			
		It represents the lower price band value for a security. When the Lower Limit Price Band field is set to zero, it identifies that the Bands are not in effect for a security.						
Low Indication Price	8	Long. Long have implied 6 decimal places and a maximum pr \$18,446,744,073,709.551615. Optionally set to zero.						
		The Low Indication Price represents an approximation of wh low end "Bid" price of a security's trading range may be. It is for a security that is not Trading Halted, i.e., Trading Range Indication or following a Trading Halt, i.e., Price Indication.						

Field Name	Length	Description				
Market Condition	1	Char.				
		Identifies the market condition of a quote for a security. Crossed Market and Locked Market are only applicable to Government Bonds. In cases of a Normal Auction Market, the Bid Price must be less than the Offer Price. In cases of a Crossed Market, the Bid Price must be greater than the Offer Price. In cases of a Locked Market, the Bid Price must be equal to the Offer Price.				
		Code Value				
		Space Normal Auction Market				
		A Crossed Market				
		B Locked Market				
MWCB Level 1 MWCB Level 2	8 8	<ul> <li>Signed Long. MWCB Level 1 value represents an index value (i.e., not a price) and has implied 6 decimal places and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807.</li> <li>Identifies the daily established drop level value (trigger value) associated with each Decline Level:</li> <li>Level 1 = 7% of Previous Close S&amp;P 500 Value</li> <li>Signed Long. MWCB Level 2 value represents an index value (i.e., not a price) and has implied 6 decimal places and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807.</li> <li>Identifies the daily established drop level value (trigger value) associated with each Decline Level:</li> <li>Level 2 = 13% of Previous Close S&amp;P 500 Value</li> </ul>				
MWCB Level 3	8	Signed Long. MWCB Level 3 value represents an <u>index value</u> ( <u>i.e., not a price</u> ) and has implied 6 decimal places and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807. Identifies the daily established drop level value (trigger value) associated with each Decline Level: Level 3 = 20% of Previous Close S&P 500 Value				

Field Name	Length	Description
National 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.
National Best Bid Price	8	8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optionally set to zero.
		Represents the Best Bid Price on a consolidated basis.
National Best Bid Quote Condition	1	Char. Space-filled.
		Identifies the Quote Condition associated with the Best Bid Price on a consolidated basis.
National Best Bid Size	4	4 Integer. Integer has a maximum size of 4,294,967,295. Optionally set to zero.
		Represents the Best Bid Size associated with the Best Bid Price on a consolidated basis.
		The Best Bid Size in units of trade represents the number of round-lots associated with the Best Bid Price for a security 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.
National 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.

Field Name	Length	Description
National Best Offer Price	8	8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optionally set to zero.
		Represents the Best Offer Price on a consolidated basis.
National Best Offer Quote Condition	1	Char. Space-filled.
		Identifies the Quote Condition associated with the Best Offer Price on a consolidated basis.
National Best Offer Size	4	4 Integer. Integer has a maximum size of 4,294,967,295 Optionally set to zero.
		Represents the Best Offer Size associated with the Best Bid Price on a consolidated basis.
		The Best Offer Size in units of trade represents the number of round-lots associated with the Best Offer Price for a security on a Consolidated basis.
		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.

Field Name	Length	Descript	ion
National BBO LULD Indicator	1	Char.	
			the affect that the Limit Up-Limit Down Price Band have on the National Best Bid and National Best Offer.
		Code	Value
		Space	Limit Up-Limit Down Not Applicable
		А	National Best Bid <u>and / or</u> National Best Offer are Executable
		В	National Best Bid below Lower Limit Price Band – National Best Bid is Non-Executable
		С	National Best Offer above Upper Limit Price Band – National Best Offer is Non-Executable
		D	National Best Bid below Lower Limit Price Band <u>and</u> National Best Offer above Upper Limit Price Band – National Best Bid <u>and</u> National Best Offer are Non- Executable
		Е	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 <u>and</u> National Best Offer above Upper Limit Price Band – National Best Offer is Non-Executable
		Н	National Best Bid below Lower Limit Price Band – National Best Bid is Non-Executable <u>and</u> National Best Offer equals Lower Limit Price Band – National Best Offer is in Limit State
		Ι	National Best Bid equals Upper Limit Price Band <u>and</u> National Best Offer equals Lower Limit Price Band (Crossed - <u>NOT</u> in Limit State)
			1

Field Name	Length	Description
National BBO LULD Indicator, continued	1	<ul> <li>Note 1: 'National BBO LULD Indicator' field will be populated with a 'Space' as follows:</li> <li>a. Prior to regular trading hours and after regular trading hours.</li> <li>b. When Price Bands are not in effect (e.g., Price Bands with zero values prevailing).</li> <li>c. Until the Price Band for a symbol is published.</li> <li>d. If no eligible quotes have taken place.</li> </ul>
Number of Extensions	1	Byte. Optionally set to zero. 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.
Offer Price	8	<ul><li>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optionally set to zero.</li><li>Represents the lowest price acceptable to a prospective seller at a particular time for a security.</li></ul>
Offer Size	4	<ul> <li>4 Integer. Integer has a maximum size of 4,294,967,295 Optionally set to zero.</li> <li>The Offer Size identifies the number of round-lots, for a security.</li> <li>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.</li> </ul>

Field Name	Length	Des	Description					
Primary Listing Market	1	Cha	Char.					
Participant ID		Ide	Identifies the Primary Listing Market for a security.					
			Code	Value				
			Space	Primary Listing Market Participant ID Not Applicable				
			А	NYSE American				
			В	NASDAQ OMX BX				
			С	NYSE National				
			D	FINRA ADF				
			Н	MIAX Pearl				
			Ι	ISE				
			J	Cboe EDGA				
			K	Cboe EDGX				
			L	LTSE				
			М	NYSE Chicago				
			Ν	NYSE				
			Р	NYSE Arca				
			Т	NASDAQ				
			U	Members Exchange				
			V	IEX				
			W	CBSX				
			Х	NASDAQ OMX PSX				
			Y	Cboe BYX				
			Z	Cboe BZX				

Field Name	Length	Description				
Quote Condition	1	Condition	a particular condition applicable to the quote. The Quote n is used to determine whether a quote qualifies for the Best Best Offer calculation.			
		Code	Value			
		Space	Quote Condition Not Applicable			
		А	Slow Quote on Offer Side (Eligible for BBO)			
		В	Slow Quote on Bid Side (Eligible for BBO)			
		С	Closing (Not eligible for BBO)			
		Е	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)			
		Н	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)			
		Ο	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)			
		in the 'Li	a BBO qualifying Bid or Offer is marked as Non-Executable mit Up-Limit Down (LULD) Indicator' field, the Non- le Bid or Offer side will <u>not qualify</u> for inclusion in the BBO ons.			

Field Name	Length	Description						
Reserved	1	Space-	Space-filled. Field is reserved for future use.					
Retail Interest Indicator	1	Char. 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.						
			Code	Value				
			Space	Retail Interest Indicator Not Applicable				
			А	Retail Interest on Bid Quote				
			В	Retail Interest on Offer Quote				
			C	Retail Interest on both the Bid and Offer Quotes				
Security Symbol	11	Char [11]. Left justified, space filled. 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.						
		<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.						
Settlement Condition	1	Char. Identifies the settlement condition for a security.						
		Code Value						
			Space	Regular Way Settlement				
			А	Cash (only) Settlement				
			В	Next Day (only) Settlement				

Field Name	Length	Description		
Short Sale Restriction Indicator	1	Char.		
		Identifies whether 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.		
			Code	Value
			Space	Short Sale Restriction Not in Effect
			Е	Short Sale Restriction in Effect
		<b>Note:</b> Short Sale Restriction Indicator values of A, C and D an not provided on the Snapshot. If Short Sale Restriction is i effect for a security, indicator 'E' is provided.		
Upper Limit Price Band	8	<ul><li>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</li><li>It represents the upper price band value for a security.</li><li>When the Upper Limit Price Band field is set to zero, it identifies that the Price Bands are not in effect for a security.</li></ul>		

## 5.0 Document Version History

Version	Date	Description
1.0	01/21/2022	Initial Document Version