



**SECURITIES INDUSTRY AUTOMATION CORPORATION**

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**CTS**

**CONSOLIDATED TAPE SYSTEM**

**PARTICIPANT INPUT BINARY SPECIFICATION**

**May 18, 2026  
Version 2.8**

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**CONTENTS**

<b>VERSION HISTORY .....</b>	<b>4</b>
<b>1.0 INTRODUCTION.....</b>	<b>9</b>
<b>1.1 Background.....</b>	<b>9</b>
<b>1.2 Dual Site Redundancy.....</b>	<b>9</b>
<b>1.3 Failure Recovery.....</b>	<b>10</b>
1.3.1 NMS Publication Process Failure Recovery .....	10
1.3.2 Input Gateway Failure and Recovery .....	10
1.3.3 Primary Data Center Failure Recovery .....	10
<b>1.4 Scope.....</b>	<b>12</b>
<b>1.5 Data Feed Reference Material.....</b>	<b>12</b>
<b>2.0 GENERAL DESIGN OF DATA DISTRIBUTION NETWORK.....</b>	<b>13</b>
<b>2.1 TCP/IP Interface Requirements .....</b>	<b>13</b>
<b>2.2 TCP/IP Input Throttling.....</b>	<b>13</b>
<b>3.0 CTS INTERFACE METHOD .....</b>	<b>14</b>
<b>3.1 General Design Considerations .....</b>	<b>14</b>
<b>4.0 TRANSMISSION CHARACTERISTICS .....</b>	<b>15</b>
<b>4.1 Data Transmission.....</b>	<b>15</b>
<b>4.2 Block Separator .....</b>	<b>15</b>
<b>4.3 Binary Block Structure .....</b>	<b>15</b>
<b>4.4 Block Data.....</b>	<b>16</b>
<b>4.5 Block Pad Byte.....</b>	<b>16</b>
<b>4.6 Data Type.....</b>	<b>16</b>
<b>4.7 Block Header .....</b>	<b>17</b>
4.7.1 Version .....	18
4.7.2 Block Size.....	18
4.7.3 Block Sequence Number .....	18
4.7.4 Messages in Block.....	18
4.7.5 Block Checksum.....	18
<b>4.8 Error Handling .....</b>	<b>19</b>
<b>5.0 MESSAGE HEADER .....</b>	<b>20</b>
<b>5.1 Message Length .....</b>	<b>20</b>
<b>5.2 Message Category and Message Type Table.....</b>	<b>21</b>
5.2.1 Message Category .....	23
5.2.2 Message Type.....	23
5.3 Participant ID .....	23
5.4 Timestamp 1 .....	24
5.5 Participant Reference Number.....	24
5.6 Message ID.....	25
5.7 Reserved .....	25
<b>6.0 MESSAGE FORMATS .....</b>	<b>25</b>
<b>6.1 Administrative Messages – Category A.....</b>	<b>26</b>
6.1.1 Rejection – Category A Type R .....	26
6.1.2 Warning – Category A Type W.....	26
<b>6.2 Control Messages – Category C .....</b>	<b>27</b>
6.2.1 Start of Day – Category C Type A .....	27
6.2.2 Sequence Information and Message Count Inquiry – Category C Type I.....	28
6.2.3 Sequence Information and Message Count Response – Category C Type N.....	28
6.2.4 Line Integrity Participant to CTS / CTS to Participant – Category C Type T.....	29
6.2.5 End of Day – Category C Type Z.....	30
6.2.6 Test – Category C Type 5.....	30
<b>6.3 Index Messages – Category I.....</b>	<b>31</b>
6.3.1 Index – Category I Type I.....	31
6.3.2 Category I Type Q – Bid and Offer Index.....	31

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

<b>6.4</b>	<b>Market Status Messages – Category M</b> .....	<b>32</b>
6.4.1	Approximate Trades and Total Dollar Value – Category M Type O .....	32
6.4.2	Crossing Session – Category M Type P .....	32
<b>6.5</b>	<b>Prior Day Messages – Category P</b> .....	<b>33</b>
6.5.1	Prior Day Trade Correction – Category P Type C.....	33
6.5.2	Fractional Prior Day Trade Correction – Category P Type O .....	34
6.5.3	Prior Day Trade– Category P Type T.....	35
6.5.4	Fractional Prior Day Trade– Category P Type R .....	36
6.5.5	Prior Day Trade Cancel/Error – Category P Type X.....	37
6.5.6	Fractional Prior Day Trade Cancel/Error – Category P Type E .....	38
<b>6.6</b>	<b>Trade Messages – Category T</b> .....	<b>39</b>
6.6.1	Auction Status – Category T Type A .....	39
6.6.2	Trade Correction – Category T Type C.....	40
6.6.3	Fractional Trade Correction – Category T Type O.....	41
6.6.4	Long Trade – Category T Type L.....	42
6.6.5	Fractional Long Trade – Category T Type R .....	42
6.6.6	Trading Status – Category T Type S .....	43
6.6.7	Short Trade – Category T Type T.....	45
6.6.8	Fractional Short Trade – Category T Type H.....	45
6.6.9	Trade Cancel/Error – Category T Type X .....	46
<b>7.0</b>	<b>FIELD DESCRIPTIONS</b> .....	<b>47</b>
	<b>APPENDIX A: CTS CONFIGURATION</b> .....	<b>70</b>
	<b>APPENDIX B: SYMBOL AND INDEX SUFFIX EXAMPLES</b> .....	<b>71</b>
	<b>APPENDIX C: GLOSSARY</b> .....	<b>73</b>
	<b>APPENDIX D: INPUT ERROR CONDITIONS</b> .....	<b>82</b>
	<b>APPENDIX E: SUMMARY OF DAILY CTS EVENT SCHEDULE</b> .....	<b>86</b>
	<b>APPENDIX F: ASCII PRINTABLE TABLE (Character Code 32-126)</b> .....	<b>87</b>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**VERSION HISTORY**

Version	Date	Description
1.0	July 1, 2016	Initial Document
1.1	September 15, 2016	<p><u>Added:</u></p> <ul style="list-style-type: none"> <li>▪ New Dedicated Test Symbols: ATEST, NTEST &amp; PTEST</li> <li>▪ New Error Code 18 to denote 'Market Center Official Closing Price'</li> </ul>
1.2	February 21, 2017	<p><u>Added:</u></p> <ul style="list-style-type: none"> <li>▪ 'Message Length' field in Message Header and field description</li> <li>▪ New 'Auction Status Category T Type A' message and field descriptions</li> <li>▪ New 'Auction Collar Price' and 'Number of Extension' Error Codes</li> <li>▪ New 'Upper Limit Price Band/Lower Limit Price Band' fields, field descriptions and Error Codes</li> <li>▪ 'Short Sale Restriction Indicator' to Correction Message</li> </ul> <p><u>Corrected:</u></p> <ul style="list-style-type: none"> <li>▪ T-Time representation to be represented in Seconds since Epoch</li> <li>▪ The implied 2 decimal (Short) maximum trade price to \$655.35</li> <li>▪ Trade Cancel/Error Message transposed appearance of 'Trade Reporting Facility ID' to be following 'Trade Through Exempt Indicator' field</li> </ul> <p><u>Eliminated:</u></p> <ul style="list-style-type: none"> <li>▪ Administrative Message 'Text Length' field (Length is identified in Message Header)</li> <li>▪ Market Summary Messages/field descriptions/error codes which are no longer supported: <ul style="list-style-type: none"> <li>○ Category M Types B, C &amp; D</li> <li>○ Category M Types E, F &amp; G</li> <li>○ Category M Types H, I &amp; J</li> </ul> </li> <li>▪ 'Sale Condition' code '@' representing a 'Regular Sale' trade (replaced with 'Space' representing a 'Regular Sale' trade)</li> <li>▪ Administrative Message 'Category A Type S' has been removed</li> <li>▪ Index Message 'Index Sign' fields and field descriptions as signed integer identifies positive/negative value.</li> </ul> <p><u>Modified:</u></p> <ul style="list-style-type: none"> <li>▪ 'Block Pad Byte' description to include binary representation</li> <li>▪ Order of field appearances in Message Header</li> <li>▪ 'Reserved' field length in Message Header</li> <li>▪ Trade Correction Message 'Corrected Instrument Type' field to 'Instrument Type'</li> <li>▪ 'Sale Condition Category' field codes representation</li> <li>▪ Index Message usable Data Type representation</li> <li>▪ Prior Day Trade Correction 'Corrected Instrument Type' field to 'Instrument Type' and eliminated 'Original Instrument Type' field</li> <li>▪ Data Type 'Signed Integer' representation description</li> <li>▪ Minor edits/clarification throughout document/removed verbiage associated with eliminated functionality</li> <li>▪ Binary and ASCII Protocol Differences and Notes</li> </ul>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**VERSION HISTORY**

Version	Date	Description
1.3	May 5, 2017	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ CBOE Stock Exchange, Inc. (CBSX) Participant ID ‘W’</li> </ul>
1.4	June 2, 2017	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ New Dedicated Test Symbols: ZIEXT, ZEXIT, ZXIET &amp; 01V thru 12V</li> </ul>
1.5	August 28, 2017	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Block Sequence Number rollover limited to occur after 999,999,999 (instead of 3,999,999,999) for a transitional period</li> <li>▪ From: NYSE MKT / To: NYSE American</li> </ul>
1.6	February 14, 2018	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ From: National Stock Exchange / To: NYSE National, Inc.</li> <li>▪ From: Bats EDGA Exchange / To: Cboe EDGA Exchange</li> <li>▪ From: Bats EDGX Exchange / To: Cboe EDGX Exchange</li> <li>▪ From: Bats BYX Exchange / To: Cboe BYX Exchange</li> <li>▪ From: Bats BZX Exchange / To: Cboe BZX Exchange</li> <li>▪ IEX status to Primary Listing Exchange</li> <li>▪ Halt Reason value ‘X’ From: Equipment Changeover / To: Operational</li> <li>▪ Description of Auction Status message</li> </ul> <u>Added:</u> <ul style="list-style-type: none"> <li>▪ Participant Reference Number requirements previously published in FAQ’S version 1.1, August 24, 2017 <a href="https://www.ctaplan.com/tech-specs">https://www.ctaplan.com/tech-specs</a> for easy reference</li> </ul>
1.7	May 8, 2018	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Trade Reporting Facility IDs</li> <li>▪ From: Financial Industry Regulatory Authority, Inc. (FINRA) / To: FINRA Alternative Display Facility (ADF)</li> </ul> <u>Eliminated:</u> <ul style="list-style-type: none"> <li>▪ Binary and ASCII Protocol Differences and Notes</li> </ul>
1.8	July 17, 2019	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ New Dedicated Test Symbols: CTEST and MTEST</li> </ul>
1.9	October 25, 2019	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ From: Chicago Stock Exchange / To: NYSE Chicago, Inc.</li> </ul>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**VERSION HISTORY**

<b>Version</b>	<b>Date</b>	<b>Description</b>
2.0	December 4, 2019	<p><u>Added:</u></p> <ul style="list-style-type: none"> <li>▪ New section “Error Handling” to describe system behavior for handling for various levels of rejects</li> <li>▪ Duplicate check for Trading Status Messages based on ‘Trading Status ID’ field</li> </ul> <p><u>Modified:</u></p> <ul style="list-style-type: none"> <li>▪ Block Sequence Number limit to rollover occur after 4,294,967,295</li> <li>▪ ‘Data Transmission’ section regarding Incorrect Block handling to reject invalid blocks and disconnect participant line</li> <li>▪ ‘Trade Dissemination Time (T-Time)’ field on Trading Status message to ‘Trading Status ID’ field</li> <li>▪ Start of Day behavior to reject any message received prior to the dissemination of Start of Day</li> <li>▪ Description of ‘Participant Reference Number’ field usage for Control Messages</li> <li>▪ Description of ‘Message ID’ field</li> <li>▪ List of Reject Codes</li> <li>▪ Description for Input Line Throttling</li> <li>▪ Minor edits and clarifications throughout document</li> </ul> <p><u>Eliminated:</u></p> <ul style="list-style-type: none"> <li>▪ Security Status codes for Opening Delay, No Open/No Resume and Trade Dissemination Time (T-Time)</li> <li>▪ Administrative Unformatted (Category A Type H) Message</li> </ul>
2.1	January 24, 2020	<p><u>Modified:</u></p> <ul style="list-style-type: none"> <li>▪ Line Integrity interval for message sent from CTS to Participant</li> <li>▪ Timeout interval for input lines</li> </ul> <p><u>Eliminated:</u></p> <ul style="list-style-type: none"> <li>▪ Value of 0 from Timestamp 1 field</li> </ul>
2.2	February 5, 2020	<p><u>Modified:</u></p> <ul style="list-style-type: none"> <li>▪ ‘Start of Day’ - clarified that Line Integrity &amp; Sequence Information and Message Count Inquiry messages are accepted prior to Start of Day</li> </ul>
2.3	March 27, 2020	<p><u>Eliminated:</u></p> <ul style="list-style-type: none"> <li>▪ Bonds and Local Issues restriction on Short Trades</li> <li>▪ Zero Participant Reference Number validation for Control Message</li> </ul>
2.4	April 09, 2020	<p><u>Modified:</u></p> <ul style="list-style-type: none"> <li>▪ Clarified Line Integrity timeout interval description</li> </ul>
2.5	May 15, 2020	<p><u>Added:</u></p> <ul style="list-style-type: none"> <li>▪ MIAX Pearl Exchange, LLC (MIAX) Participant ID ‘H’</li> <li>▪ Members Exchange, LLC (MEMX) Participant ID ‘U’</li> <li>▪ Support for non-Regulatory halt reason codes for non-listing participants</li> </ul>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**VERSION HISTORY**

<b>Version</b>	<b>Date</b>	<b>Description</b>
2.5a	June 5, 2020	<u>Corrected:</u> <ul style="list-style-type: none"> <li>▪ Description for Block Sequence number</li> </ul>
2.5b	July 22, 2020	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ Throttling rate for input lines</li> </ul>
2.6	August 14, 2020	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ New Regulatory Halt Reason Codes (A, C, E, F, N, O and V)</li> </ul> <u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Renamed Regulatory Halt Reason Code D from News Dissemination to News Released</li> </ul>
2.6a	January 26, 2021	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Section for CTS Interface Method to clarify that Input Block Sequence can be reset to a higher sequence number</li> <li>▪ Clarified that all Halt Reason Codes are currently active</li> </ul>
2.6b	June 28, 2021	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Redefined Sale Condition 'X' from 'Cross Trade' to 'Cross/Periodic Auction Trade'</li> </ul>
2.6c	Oct 26, 2022	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Added section 1.3 to clarify system behavior during Failure Recovery</li> </ul>
2.6d	Dec 16, 2022	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Corrected Symbol Suffix examples under Appendix B to include series U</li> </ul>
2.6e	Jan 5, 2024	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Removed Test Symbol 'ZZZ' and 'IBO' and updated Listing Exchange for Test Symbol 'CTEST' under Security Symbol Field Description</li> </ul>
2.7	Mar 28, 2024	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Renamed 'Limit Up-Limit Down Quote Midpoint' to 'Limit Up-Limit Down Reference Price' throughout the document</li> <li>▪ Updated input Validation for LULD Reference Price under Category T Type S Trading Status message</li> <li>▪ Added clarification on the usage of field 'Last Price / Opening (Reopening) LULD Reference Price' in the Trading status message</li> <li>▪ Updated Last Eligibility for Market Center Opening Trade ('O') to be always Last eligible</li> </ul> <u>Added:</u> <ul style="list-style-type: none"> <li>▪ Additional Message Types for Fractional Share Trade Reporting (refer Message Category and Message Type Table)</li> </ul>
2.7a	May 2, 2024	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Sale Condition 'N' (Next Day Trade) marked as Reserved as input Participants will transition to a shortened standard settlement cycle starting May 28, 2024</li> </ul>
2.7b	June 12, 2024	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Updated CTS Configuration diagram under Appendix A to remove reference to 'ICE Global Network'</li> </ul>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**VERSION HISTORY**

Version	Date	Description
2.7c	August 30, 2024	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Updated Security Status Market on Close Imbalance to Closing Imbalance and changed its definition</li> </ul>
2.7d	May 2, 2025	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Definition of symbol lot size under glossary to include lot size of 40</li> <li>▪ Renamed NYSE Chicago to NYSE Texas and updated Listing Exchange for test symbol MTEST to NYSE Texas</li> </ul>
2.7e	June 6, 2025	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ 24X National Exchange LLC (24X) Participant ID ‘G’</li> </ul>
2.7f	January 29, 2026	<ul style="list-style-type: none"> <li>▪ <u>Updated maximum supported value for Price fields under Field Description</u></li> <li>▪ <u>Added Participant Code for Texas Stock Exchange</u></li> </ul>
2.8	May 18, 2026	<ul style="list-style-type: none"> <li>▪ Updated to support Extended Trading Hours (see <a href="#">Appendix E</a>): <ul style="list-style-type: none"> <li>○ Updated Hours of Operations and event schedule</li> <li>○ Introduced Overnight Price Bands during Extended Trading Hours</li> <li>○ Incorporated explicit publication of Halts and Short Sale Restrictions by CTA at SOD</li> <li>○ Clarified CTA behavior to handle Halt and SSR state at the end of a session under Field Description for ‘<a href="#">Halt Reason</a>’ and ‘<a href="#">Short Sale Restriction Indicator</a>’</li> </ul> </li> <li>▪ Updated Halt Reason Code ‘A’ description under <a href="#">Halt Reason</a></li> <li>▪ Renamed Nasdaq BX to Nasdaq Texas</li> </ul>

## 1.0 INTRODUCTION

The Securities Industry Automation Corporation (SIAC) serves as the Processor for the Consolidated Tape Plan from its inception on April 30, 1976. In fulfilling its role as the Processor, SIAC plans, develops, operates, and maintains the Consolidated Tape System (CTS).

### 1.1 Background

CTS receives transactions generated by participating U.S. Stock Exchanges and the FINRA Alternative Display Facility (ADF). In addition, CTS calculates and identifies the Consolidated Last, High and Low, the Participant Open, Last, High and Low and the Limit Up-Limit Down Price Bands. CTS consolidates transactions that occurred on participating U.S. Stock Exchanges and the FINRA Alternative Display Facility (ADF) and disseminates this information via computer-to-computer linkages to the financial community in the U.S. and abroad.

Trade market data generated by each Participant and FINRA ADF is assembled in prescribed message formats and transmitted to the appropriate TCP/IP Processor address via the Participant's private communications facility. As each block is received, it is transmitted simultaneously to all data recipients via their private communications facilities. Approved data recipients of the CTS service can redistribute CTS 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 Tape System (CTS) and the Consolidated Quotation System (CQS) in order to receive complete listed equity market data. Reference the CTS and CQS Multicast Interface Specification for further details at: [www.ctaplan.com](http://www.ctaplan.com).

### 1.2 Dual Site Redundancy

Computer systems that support the processing and dissemination of trade 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, CTS 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), all Participant input socket connections at the Primary Data Center will be **closed**. Participants should have an automated mechanism in place once a Participant's Primary Data Center's input sockets close, to 'hunt' for the Participant's open input sockets at the Backup Data Center, and immediately establish input connectivity to either their primary or backup input connections (primary and backup connections are assigned the same port number however, the IP addresses are different) **within ten (10) minutes as per SEC requirement**.

## 1.3 Failure Recovery

### 1.3.1 NMS Publication Process Failure Recovery

- In the event the Primary publication process encounters an unexpected state, data publication automatically switches to the Secondary publication process on the Primary Data Center
  - Data Subscribers may observe gaps on the affected output multicast lines. Any such gaps can be requested for retransmission
- In the event where both the Primary and Secondary publication processes encounter an unexpected state at the same time on the Primary Data Center, Pillar CTA initiates an automatic restart for both the processes in a recovery mode
  - There is no impact to the input Data Participants
  - Data publication is paused for the affected output line(s) and any input messages received while the process is being restarted are queued and published once the processes recover
  - Upon recovery, output block sequence for the affected line(s) is reset to a higher Block Sequence number. System transmits the Reset Block Sequence Number (Category C Type L) message and resumes data publication.
  - Security symbol state including the LULD Price Bands is recovered. However, Trade Statistics (Open/High/Low/Last) are not persisted. Subsequent Trade Statistics are calculated based on any new Trades received after the process restart.
  - Trades messages received prior to the process restart cannot be Cancelled/Corrected on the same day; but can be done on the next trading day via the Prior Day (Category P) Messages.
  - All Messages for the day can be requested for retransmission, including those that were received prior to, or, while the processes were being restarted.

### 1.3.2 Input Gateway Failure and Recovery

- In the event the Primary input Gateway connection encounters an unexpected state, Input Participants can reconnect to the Secondary (backup) input connection
- In the event the Input Gateway encounters an unexpected state affecting both the Primary and Secondary Input Connections for all the Data Participants, a restart of the Input Gateway can be initiated on the Primary Data Center.
  - Both Primary and Secondary Input connections are temporarily unavailable, affecting all Participants and Data Subscribers from inputting any data or requesting any retransmissions
  - Upon recovery, Input Block Sequence Number and PRN are recovered for each input line. Data Participants can reestablish connection and start submitting data. Data publication resumes.
  - There is no loss of data, all messages can be requested for retransmission.

### 1.3.3 Primary Data Center Failure Recovery

In the event that the Primary Data Center becomes unavailable, failover to the Disaster Recovery site (Backup Data Center) is initiated. However, if the DR site is also unavailable, then a Session Cold Restart on the Primary Data Center can be performed.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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In case of a Session Cold Restart on the Primary Data Center:

- Both Primary and Secondary Input connections are temporarily unavailable, affecting all Participants and Data Subscribers from inputting any data or requesting any retransmissions
- Upon restart:
  - Output block sequence for all the lines is reset to a higher Block Sequence number and System transmits the Reset Block Sequence Number (Category C Type L) message
  - Security symbol state including the LULD Price Bands is recovered. However, Trade Statistics (Open/High/Low/Last) are not persisted. Subsequent Trade Statistics are calculated based on any new Trades received after the process restart.
  - Trades messages received prior to the process restart cannot be Cancelled/Corrected on the same day; but can be done on the next trading day via the Prior Day (Category P) Messages.
  - Input Lines are enabled and Data Publication Resumes
  - Messages prior to the Restart cannot be requested for Retransmission

## 1.4 Scope

This specification defines the interface specification and message format requirements for Participants inputting into CTS.

## 1.5 Data Feed Reference Material

### Technical Specifications

For Technical Specifications visit [www.ctaplan.com](http://www.ctaplan.com) - and select Tech Specs tab for the following:

- CQS Participant Input Specification
- CQS Multicast Output Specification
- CTS Participant Input 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](http://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](http://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 ICE Global Network (IGN), formerly known as the Secure Financial Transaction Infrastructure (SFTI), connections to CQS:

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

## **2.0 GENERAL DESIGN OF DATA DISTRIBUTION NETWORK**

The CTS communications interface design utilizes the TCP/IP protocol.

### **2.1 TCP/IP Interface Requirements**

The requirements for the TCP/IP Network Interface are in the addendum to this document, “TCP/IP for National Market System (NMS) Participant Input”. Participants may request to receive the CTS and TCP/IP Participant Input Specifications by sending an email message to [CTA-OPRA-Support@siac.com](mailto:CTA-OPRA-Support@siac.com).

### **2.2 TCP/IP Input Throttling**

Input messages for each line are read at a pre-assigned rate, currently 7,000 messages per rolling 10 milliseconds. A line is throttled when a participant exceeds the maximum number of messages allowed during the current time window. Throttled messages are queued and processed in time sequence as the message read rate allows.

### **3.0 CTS INTERFACE METHOD**

Any Participant may input to CTS over one or more logical TCP/IP connections. Each logical connection is considered a complete independent entity. Participants with multiple input connections should ensure that all transactions for any one symbol (e.g., ABC) are sent over the same line throughout the day. Should transactions for the same symbol be sent simultaneously over separate connections, CTS would not guarantee the order of processing.

Each Participant is supplied with Primary Data Center IP addresses/ports (primary and backup) and Disaster Recovery site (Backup Data Center) IP addresses/ports primary and backup). Primary and backup connections are assigned the same port number however the IP addresses (primary and backup) are different.

In the event a Participant detects a failure of the primary host connection at the Primary Data Center, Participants will be required to establish a connection to the backup host connection which is running in parallel to the primary host at the Primary Data Center. In the event the Primary Data Center is unavailable, each Participant will be required to connect to the Disaster Recovery site (Backup Data Center) IP addresses/ports.

Once a Participant establishes a connection, SIAC recommends that the Participant system, prior to transmitting data, generate a Sequence Information and Message Count Inquiry message to obtain the last Block Sequence Number obtained by CTS. If there is a discrepancy in the sequence numbers wherein CTS expects a lower sequence number than what the Participant system is ready to send, the Participant system should re-send the messages in question, before generating any new messages.

Note: CTS can reset the Block Sequence number on input lines to a higher value if there are issues in sequence number handshake between a participant and CTS. Participant system shall be able to process the jump in next expected sequence number when reestablishing connection with CTS.

#### **3.1 General Design Considerations**

CTS receives and transmits variable length blocks having maximum lengths of 1000 bytes. The length includes a Block Length Header, Block Data and an optional Block Pad Byte.

## 4.0 TRANSMISSION CHARACTERISTICS

### 4.1 Data Transmission

Data transmitted between the Participants and CTS is sent using TCP/IP. For a description of the TCP/IP segment, reference the addendum to this document, ‘TCP/IP for NMS Participant Interface Input’. Participants may request to receive the CTS and TCP/IP Participant Input Interface Specifications by sending an email message to [CTA-OPRA-Support@siac.com](mailto:CTA-OPRA-Support@siac.com).

The CTS data is sent as a CTS Binary Block, and becomes the TCP/IP payload. Since TCP/IP is byte-stream, a CTS Binary Block boundary may not match the TCP segment boundary; for example, a single TCP segment may contain more than one CTS Binary Block or a CTS Binary Block can be spread between two TCP segments.

A Participant is required to send a Block Separator which will be used to determine the start of the CTS Binary Block. It is the Participant’s responsibility to create the correct CTS Binary Block structure. Incorrect Block Structure information (e.g., incorrectly formatted Block Header, invalid Block Data, etc.) will result in lost messages and blocks being rejected back to a Participant, possibly followed by a port level disconnect.

### 4.2 Block Separator

**Byte [2].** The separator is a 2 Byte sequence of Hex 0xA5 & 0x5A (offers better guarantees that the format will be identified correctly). The source of the Block Separator is both from a Participant to CTS and from CTS to a Participant. The Block Separator is not included in the block size it is independent of the Block. Every Block must be preceded by a Block Separator.

### 4.3 Binary Block Structure

A Block can have a maximum of 1,000 bytes inclusive of Block Separator, Block Header, Block Data, and Block Pad Byte.

Block Structure	Length
Block Header	10
Block Data	Variable
Block Pad Byte (optional)	1

#### 4.4 Block Data

The Block Data consists of one or more CTS 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

#### 4.5 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.

#### 4.6 Data Type

The following data types are used by CTS:

Type	Description
<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
signed byte	Big-Endian Signed 1 Byte Integer
signed short	Big-Endian Signed 2 Byte Integer
signed integer	Big-Endian Signed 4 Byte Integer
signed long	Big-Endian Signed 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

#### 4.6.1 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
6. Signed integers are represented as 2's compliment

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)

#### 4.6.2 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

#### 4.7 Block Header

Field	Length	Type
Version	1	Byte
Block Size	2	Short
Block Sequence Number	4	Integer
Messages In Block	1	Byte
Block Checksum	2	Short
<b>Total Length</b>	<b>10</b>	

#### 4.7.1 Version

**Byte.** Indicates the CTS 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.

#### 4.7.2 Block Size

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

#### 4.7.3 Block Sequence Number

**Integer.** All transmission blocks are assigned a sequential Block Sequence Number. On a per line basis, the Block Sequence Number on the lines are reset at the start of each day, and incremented by one each time a Block is transmitted, with the following conditions:

- CTS expects a one (1) as first Block Sequence Number.
- All Blocks containing Sequence Information and Message Count Inquiry message (Category C Type I) should have a Block Sequence Number set to zero.
- The Block Sequence Number field is not incremented for Participant to CTS Line Integrity (Category C Type T) messages
- On every connection and reconnection, SIAC recommends a Participant input a Sequence Information and Message Count Inquiry message (Category C Type I) to synchronize with the expected sequence number.
- If a Participant inputs a Sequence Information and Message Count Inquiry message (Category C Type I), CTS will respond with a Sequence Information and Message Count Response (Category C Type N) message with the 'Current Block Sequence Number' field populated with the next expected Block Sequence Number from the Participant, the 'Last Participant Reference Number Received' field populated with the last Participant Reference Number from the Participant and the count of messages received on an individual line since startup. Message count does not include Line Integrity messages or Sequence Information and Message Count Inquiry messages.
- When the Block Sequence Number reaches 4,294,967,295, the next expected value is zero

#### 4.7.4 Messages in Block

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

#### 4.7.5 Block Checksum

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

## 4.8 Error Handling

It is the Participant's responsibility to submit syntactically correct messages. Any message block with invalid structure or incorrect data will elicit a Rejection response with an error code matching the first error encountered in the processing. There are various levels of validations performed on the input messages as follows:

1. Any incorrectly formatted message block results in the block being rejected back to the Participant, immediately followed by a port level disconnect. The Block Sequence number is not incremented in this case since it cannot be ascertained whether any part of the message block is valid. Syntax errors include:
  - Incorrect Block Header information, e.g. wrong version, Block Size or number of messages contained in the block
  - Invalid Block Structure, e.g. a Block containing more than one control message,
  - Syntactically invalid data, e.g. a non-printable ASCII character
  - Unrecognized Message Category/Type
  - Incorrect Message Length for the Message Category/Type
2. Incorrect Session Level information results in the entire message block or an individual message being rejected back to the participant. For each connection, upon breaching a maximum number of session level rejects, the input port is disconnected followed by a Denial of Service. Any attempt to connect to the target port is denied until the Denial of Service timer expires. The default threshold is 100 session level rejects triggering a Denial of Service for a minimum of 60 seconds. Session Layer Rejects include:
  - Block header validation failure due to lower than expected Block Sequence Number - The Block Sequence Number is not incremented in this case as the entire block is rejected
  - Message Header validation failure due to invalid Participant ID, Timestamp or 'Message ID' - Each incorrect message is rejected individually and the Block Sequence number is incremented.
3. Incorrect data in the Message Body as per the Field Description or incorrect messages based off of the symbol state are treated as Application Level Rejects. The Block Sequence Number is incremented and the Input connection is not affected by such rejects

## 5.0 MESSAGE HEADER

The Message Header uniquely identifies the Message Category and Message 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 Name	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
Reserved	4	TBD
Participant Reference Number	8	Signed Long
<b>Total Length</b>	<b>26</b>	

### 5.1 Message Length

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

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

## 5.2 Message Category and Message Type Table

**Note:** For Fractional Share Trade Reporting, CTA SIP will introduce the new inbound Prior Day and Trade messages for use by those participants that require their members to report trades in fractional share quantities, tentatively scheduled for Q1 2026.

The new messages for Fractional Share Reporting, as highlighted in the below table, must be used to report trades that include a fractional component (sub 1 share - fractional only, mixed share - whole along with fractional) and may be used to report whole share trades (must include implied 6 decimals).

Prior to production implementation of this release, any of the fractional share Prior Day or Trade message types received from any input Participant will be treated as unknown message types, with the input Block rejected and the originating input line disconnected (refer section 4.8 Error Handling).

Message Category	Message Type	Message Source*	Value
<b>Administrative</b>			
A	R	CTS	Rejection
A	W	CTS	Warning
<b>Control</b>			
C	A	CTS	Start of Day
C	I	Participant	Sequence Information and Message Count Inquiry
C	N	CTS	Sequence Information and Message Count Response
C	T	Part. & CTS	Line Integrity
C	Z	CTS	End of Day
C	5	Part. & CTS	Test
<b>Index</b>			
I	I	Participant	Index
I	Q	Participant	Bid and Offer Index
<b>Market Status</b>			
M	O	Participant	Approximate Trades and Total Dollar Value
M	P	Participant	Crossing Session Summary
<b>Prior Day</b>			
P	C	Participant	Prior Day Trade Correction
P	T	Participant	Prior Day Trade
P	X	Participant	Prior Day Trade Cancel/Error
P	O	Participant	Fractional Prior Day Trade Correction
P	R	Participant	Fractional Prior Day Trade
P	E	Participant	Fractional Prior Day Trade Cancel/Error

\* The *source* of the message can originate from either a **Participant (Part.)** or from the CTS Processor.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**Message Category and Message Type Table, *continued***

Message Category	Message Type	Message Source*	Value
<b>Trade</b>			
T	A	Participant	Auction Status
T	C	Participant	Trade Correction
T	L	Participant	Long Trade
T	S	Part. & CTS	Trading Status
T	T	Participant	Short Trade
T	X	Participant	Trade Cancel/Error
T	O	Participant	Fractional Trade Correction
T	R	Participant	Fractional Long Trade
T	H	Participant	Fractional Short Trade

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**5.2.1 Message Category**

**Char.** The Message Category represents the message classification. Refer to Message Category and Message Type Table *section 5.2*.

**5.2.2 Message Type**

**Char.** The Message Type together with the Message Category identifies the message. Refer to Message Category and Message Type Table *section 5.2*.

**5.3 Participant ID**

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

Code	Value
A	NYSE American, LLC (NYSE American)
B	NASDAQ Texas, LLC. (NTX)
C	NYSE National, Inc. (NYSE National)
D	FINRA Alternative Display Facility (ADF)
F	<u>Texas Stock Exchange LLC (TXSE)</u>
G	24X National Exchange LLC (24X)
H	MIAX Pearl Exchange, LLC (MIAX)
I	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)
M	NYSE Texas, Inc. (NYSE Texas)
N	New York Stock Exchange, LLC (NYSE)
P	NYSE Arca, Inc. (NYSE Arca)
S	Consolidated Tape System (CTS)
T	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)

## 5.4 Timestamp 1

**2 x Integer (pair of integers).** Timestamp 1 is a Participant-provided timestamp representing the number of 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). For any messages generated by CTS, e.g., messages generated on behalf of a Participant, Administrative messages and Control messages, the Timestamp 1 field will be set to Zero.

- **If from an Exchange: Timestamp 1** must be populated and denotes the Exchange Matching Engine Publication timestamp for a transaction. 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) or a FINRA Trade Reporting Facility (TRF):** Timestamp1 must be populated and denotes the time of execution that a FINRA member reports to the FINRA ADF or a FINRA TRF. FINRA shall provide such times to the Processor in terms of nanoseconds since Epoch.

## 5.5 Participant Reference Number

**Signed Long.** Optionally set to Zero. The Participant Reference Number must be populated and should be unique by Participant ID, by Trade Reporting Facility (TRF), and by Security Symbol for trade corrections, cancel and errors. A Participant Reference Number must be increasing (not necessarily in sequential order, e.g., different symbols, ABC and XYZ may have the same Participant Reference Number over different lines, however symbol ‘ABC’ with Participant Reference Number ‘123456’ on line 1 cannot be repeated over any other line, duplications will be rejected. Only zero and positive Participant Reference Numbers are allowed (negative Participant Reference Numbers will be rejected).

**Note:** SIAC requires Participants continue to use their ASCII Regional Reference Number (RRN) production population convention when populating the Binary Participant Reference Number (PRN) field. Participants should construct a 6 byte ASCII Regional Reference Number (RRN) and perform a byte-copy of those 6 characters to the lower-significant 6 bytes of the 8 byte PRN field and fill the upper-significant two bytes of the PRN to binary 0s.

RRN/PRN Input Example:

ASCII RRN:

1	2	3	A	b	C
---	---	---	---	---	---

New Binary PRN:

0	0	1	2	3	A	b	C
---	---	---	---	---	---	---	---

PRN Validation:

- Participant Reference Numbers that do not conform to the ASCII ‘Regional Reference Number’ data format range requirements in the last six characters **will be rejected**.

## 5.6 Message ID

**Byte.** The Message ID identifies the individual message within the block beginning with number one (1). The Message ID for subsequent messages within a block should be incremented.

## 5.7 Reserved

Space filled. Field is **Reserved for Future Use to be determined (TBD)**.

## 6.0 MESSAGE FORMATS

The Message Category and Message Type identify the Message and determine the format of the body. .

All messages formats have fixed field which is determined by reading the Message Header and Message Body.

If the Participant input fails any of the Message Category and Message Body validations, a reject message is returned to the Participant on the line from which the original message was sent.

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 Messages – Category A

The Administrative Category A message is sent from CTS to a Participant.

### 6.1.1 Rejection – Category A Type R

If CTS receives an invalid Block structure, the invalid Block structure will be rejected. If the Block Header contains invalid data, the Block will be rejected. After CTS receives a message, CTS validates the message and will process if valid and reject if invalid. All blocks or message types can elicit a Rejection response from CTS.

The Rejection message is used for all errors to notify a Participant that CTS has found an error either in the Block Header, Message Header or Message body (e.g., an invalid Price) in a Participant Input message.

Field Name	Length	Type
Error Code	1	Byte
Block Sequence Number	4	Integer
Participant Reference Number	8	Signed Long
Message ID	1	Byte
<b>Total Length</b>	<b>14</b>	

### 6.1.2 Warning – Category A Type W

The Warning message is sent from CTS to a Participant in response to a Block Sequence Number Gap. The Block will still be processed by CTS.

Field Name	Length	Type
Previous Block Sequence Number	4	Integer
Previous Participant Reference Number	8	Signed Long
<b>Total Length</b>	<b>12</b>	

## 6.2 Control Messages – Category C

Control messages are used to report specific system events. The source of a Control message can originate from either a Participant or from the CTS Processor. Control message formats fall into two categories:

- Those consisting of a Message Header only
- Those consisting of a Message Header and Message Body

Only one Control message is transmitted in a block and no other messages appear in that block. Block containing another message along with a control message is treated as incorrectly formatted block.

### A. Control Messages Consisting of Message Header Only

Message Category	Message Type	Value
C	A	Start of Day
C	I	Sequence Information and Message Count Inquiry
C	T	Line Integrity
C	Z	End of Day

### B. Control Messages Consisting of Message Header and Message Body

Message Category	Message Type	Value
C	N	Sequence Information and Message Count Response
C	5	Test

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

The Start of Day message consists of the **Message Header only** and is sent by CTS to a Participant to indicate CTS' readiness to accept data transmission from the Participant to which the message is transmitted. A Participant cannot initiate data transfer with CTS until receipt of this message. Messages received by CTS before the Start of Day message has been transmitted will be rejected, except for Line Integrity (Category C Type T) and Sequence Information and Message Count Inquiry (Category C Type I) messages.

### 6.2.2 Sequence Information and Message Count Inquiry – Category C Type I

The Sequence Information and Message Count Inquiry message consists of the **Message Header only**. Participants’ computers and the CTS processor use the Sequence Information and Message Count Inquiry message to synchronize message sequence numbers. Upon receipt of this message, CTS transmits back to the inquiry processor a Sequence Information and Message Count Response Category C Type N message containing the sequence number of the next expected message and the count of messages received on an individual line since startup. Multiple lines for a single Participant are treated as independent lines with their own message sequence numbers. The Sequence Information and Message Count Inquiry message is transmitted in a separate message block containing only the Sequence Information and Message Count Inquiry message and must be sent with the Block Sequence Number field set to Zero

### 6.2.3 Sequence Information and Message Count Response – Category C Type N

The Sequence Information and Message Count Response message is generated by CTS to a Participant in response to a Sequence Information and Message Count Inquiry message. The Sequence Information and Message Count Response message is transmitted in a separate message block containing only the Sequence Information and Message Count Response message.

Field Name	Length	Type	Value
Current Block Sequence Number	4	Integer	Contains Next Expected Participant Block Sequence Number
Last Participant Reference Number	8	Signed Long	Contains Last Participant Reference Number Received
Message Count	8	Long	Contains the count of messages received on an individual line since startup. Message count does not include Line Integrity Messages or Sequence Information and Message Count Inquiry messages
<b>Total Length</b>	<b>20</b>		

**Note:**

- The Participant Reference Number that is returned is the Participant Reference Number received for the individual line on which the Sequence Inquiry and Message Count Inquiry message was sent.

## 6.2.4 Line Integrity Participant to CTS / CTS to Participant – Category C Type T

### Line Integrity Participant to CTS:

The **Participant to CTS** Category C Type T Line Integrity message consists of the **Message Header only** and is for optional use by a Participant. Line Integrity messages may be generated by a Participant to CTS at set intervals selected by a Participant.

A timeout duration of 10 seconds is defined for all input lines. A Participant is required to input messages with an idle time of no more than 5 seconds. Once connected, if a Participant does not input Category C Type T messages or any other data to CTS within the configured timeout interval, CTS will wait for additional time (typically 10 seconds) and if still no message is received, CTS will break the connection on the Participants' connected input line. This will allow the Participant to reconnect to their primary or backup input line (e.g., a connection should be made to the backup input line if the disconnect was made to the primary, and conversely, a connection should be made to the primary input line if the disconnect was made to the backup input line).

The Message Header field descriptions will be the same as in this CTS Participant Input Interface Specification, with the exception of the Block Sequence Number field which will be populated as follows:

- The Block Sequence Number field is not incremented for Participant to CTS Category C Type T Line Integrity messages. The Block Sequence Number field will contain the Block Sequence Number of the last original message generated by the Participant.

### Line Integrity CTS to Participant:

The **CTS to Participant** Category C Type T Line Integrity message consists of the **Message Header only** and is generated by CTS to each Participant at 10 seconds intervals. CTS can commence sending Line Integrity messages to Participant once the Participants' lines have been started and the Participant has established connections. Its primary function is to provide verification of line integrity during periods of inactivity.

Line Integrity messages generated by CTS to a Participant will have the Message Header Timestamp 1 field populated with the Line Integrity time. 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).

### Note:

- A Line Integrity message coming from a Participant to CTS is mutually exclusive from a Line Integrity message sent by CTS to a Participant (there is no correlation between the two Line Integrity message functionalities).

### 6.2.5 End of Day – Category C Type Z

The End of Day message consists of the **Message Header only** and is sent by CTS to a Participant to indicate that the Participant should not transmit any further messages to CTS. Messages received by CTS after the End of Day message has been transmitted will be rejected.

### 6.2.6 Test – Category C Type 5

CTS or a Participant may generate a Test message at any time during the day. Its function is to exercise the line to verify transmission integrity. A Test message is transmitted as the only message in a block.

Field Name	Length	Type	Value
Data	256	Byte [ ]	All ASCII characters starting with hex 0 and ending hex FF, in sequential order.
<b>Total Length</b>	<b>256</b>		

### 6.3 Index Messages – Category I

Index messages are used to provide index value information of a security.

#### 6.3.1 Index – Category I Type I

The Index message contains the index and the index value.

Field Name	Length	Type
Index Symbol	11	Char [ ]
Index Value	8	Signed Long
<b>Total Length</b>	<b>19</b>	

#### 6.3.2 Category I Type Q – Bid and Offer Index

The Bid and Offer Index message contains the Bid and Offer index values.

Field Name	Length	Type
Index Symbol	11	Char [ ]
Bid Index Value	8	Signed Long
Offer Index Value	8	Signed Long
<b>Total Length</b>	<b>27</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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## 6.4 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.

### 6.4.1 Approximate Trades and Total Dollar Value – Category M Type O

The Approximate Trades and Total Dollar Value message allows a Participant to report the total trades and total dollar value of trades at their respective market centers. A Participant is required to utilize all fields in the Approximate Total Trades and Dollar Value message.

Field Name	Length	Type
Total Trades	4	Integer
Dollar Value	8	Long
<b>Total Length</b>	<b>12</b>	

### 6.4.2 Crossing Session – Category M Type P

The Crossing Session message is used to report the total volume and dollar value of trades transacted after the close of a Participant's regular session.

Field Name	Length	Type
Crossing Session I Total Trades Volume	8	Long
Crossing Session II Dollar Value	8	Long
Crossing Session II Total Trades Volume	8	Long
<b>Total Length</b>	<b>24</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

## 6.5 Prior Day Messages – Category P

Prior Day messages are used to report CTA eligible Equity, Local Issue or Bond trades, corrections, cancels or errors for transactions that occurred **earlier than the current trading day** (i.e. earlier than the current CTA session) and had not been reported. Trade Reporting Facility ID is restricted to CTA eligible Equity transactions.

### 6.5.1 Prior Day Trade Correction – Category P Type C

The Prior Day Trade Correction message is used to correct a transaction originally reported earlier than the current CTA session. Corrections to transactions originally reported during the current CTA session are reported using the Trade Correction message Category ‘T’ Type ‘C’. Participants must provide the original trade information in the message.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Corrected Sale Condition	4	Char [ ]
Corrected Trade Price	8	Long
Corrected Trade Volume	4	Integer
Corrected Seller’s Sale Days	1	Byte
Corrected Stop Stock Indicator	1	Char
Corrected Trade Through Exempt Indicator	1	Char
Corrected Short Sale Restriction Indicator	1	Char
Corrected Prior Day Trade Date and Time	8	2 x Integer
Trade Reporting Facility ID	1	Char
Original Sale Condition	4	Char [ ]
Original Trade Price	8	Long
Original Trade Volume	4	Integer
Original Seller’s Sale Days	1	Byte
Original Stop Stock Indicator	1	Char
Original Trade Through Exempt Indicator	1	Char
Original Short Sale Restriction Indicator	1	Char
Original Prior Day Trade Date and Time	8	2 x Integer
<b>Total Length</b>	<b>69</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**6.5.2 Fractional Prior Day Trade Correction – Category P Type O**

The Fractional Prior Day Trade Correction message is similar to the Prior Day Trade Correction message and is used when either the original or the corrected volume is a fractional value. Volume is represented as a fractional value.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Corrected Sale Condition	4	Char [ ]
Corrected Trade Price	8	Long
Corrected Fractional Trade Volume	8	Long
Corrected Seller's Sale Days	1	Byte
Corrected Stop Stock Indicator	1	Char
Corrected Trade Through Exempt Indicator	1	Char
Corrected Short Sale Restriction Indicator	1	Char
Corrected Prior Day Trade Date and Time	8	2 x Integer
Trade Reporting Facility ID	1	Char
Original Sale Condition	4	Char [ ]
Original Trade Price	8	Long
Original Fractional Trade Volume	8	Long
Original Seller's Sale Days	1	Byte
Original Stop Stock Indicator	1	Char
Original Trade Through Exempt Indicator	1	Char
Original Short Sale Restriction Indicator	1	Char
Original Prior Day Trade Date and Time	8	2 x Integer
<b>Total Length</b>	<b>77</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**6.5.3 Prior Day Trade– Category P Type T**

The Prior Day Trade message is used to report a CTA eligible Equity, Local Issue or Bond transaction which occurred **earlier than the current trading day** and was not reported.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Trade Volume	4	Integer
Seller's Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Prior Day Trade Date and Time	8	2 x Integer
<b>Total Length</b>	<b>41</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**6.5.4 Fractional Prior Day Trade– Category P Type R**

The Fractional Prior Day Trade message is similar to the Prior Day Trade message and used to report trade with fractional volume, which occurred earlier than the current trading day and was not reported.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Fractional Trade Volume	8	Long
Seller's Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Prior Day Trade Date and Time	8	2 x Integer
<b>Total Length</b>	<b>45</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**6.5.5 Prior Day Trade Cancel/Error – Category P Type X**

The Prior Day Trade Cancel/Error message is used for CTA eligible Equity, Local Issue or Bond information to report the cancellation of a trade (buyer and seller agrees to cancel a trade) or error a trade that never took place but was reported. This message format is strictly used to cancel/error a trade or correction originally reported earlier than the current day. Cancel/Errors to transactions originally reported during the current CTA session are reported using the Cancel/Error message, Category ‘T’ Type ‘X’. Participants must provide the original trade information in the message.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Trade Volume	4	Integer
Seller’s Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Prior Day Trade Date and Time	8	2 x Integer
Cancel/Error Action	1	Char
<b>Total Length</b>	<b>42</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**6.5.6 Fractional Prior Day Trade Cancel/Error – Category P Type E**

The Fractional Prior Day Trade Cancel/Error message is similar to the Prior Day Trade Cancel/Error message and is used to report the cancellation or error of a fractional trade or correction that was reported earlier than the current day.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Fractional Trade Volume	8	Long
Seller's Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Prior Day Trade Date and Time	8	2 x Integer
Cancel/Error Action	1	Char
<b>Total Length</b>	<b>46</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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## 6.6 Trade Messages – Category T

Trade messages are used to report CTA eligible Equity, Local Issue or Bond information. Trade messages allow for automated corrections, cancellations or errors of trade reports (originally reported using fixed message formats), reporting Trading Halts, Resumes, Indications and Imbalances.

### 6.6.1 Auction Status – Category T Type A

The Auction Status message is transmitted when a Participant in a CTA eligible security, Local Issue or a Bond 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
<b>Reserved (for future use)</b>	<b>62</b>	<b>TBD</b>
<b>Total Length</b>	<b>99</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**6.6.2 Trade Correction – Category T Type C**

The Trade Correction message is used to correct transactions originally reported during the current CTA session. A Participant Reference Number must be assigned to the original transaction that is to be corrected. The Participant Reference Number of trade being corrected must be unique by Participant ID, by Trade Reporting Facility (TRF) and by Security Symbol and by Participant Regional Reference Number.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Corrected Sale Condition	4	Char [ ]
Corrected Trade Price	8	Long
Corrected Trade Volume	4	Integer
Corrected Seller's Sale Days	1	Byte
Corrected Stock Stop Indicator	1	Char
Corrected Trade Through Exempt Indicator	1	Char
Corrected Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Timestamp 2	8	2 x Integer
Original Participant Reference Number <i>(of original transaction being corrected)</i>	8	Signed Long
<b>Total Length</b>	<b>49</b>	

**Note:**

- To identify a transaction being corrected, the Participant Reference Number assigned to the original trade, or if the original trade has already been corrected, the Participant Reference Number of the most recent correction to the trade, is to be reflected in the Participant Reference Number field of the Correction Message body. Trades which have been previously cancelled or errored, cannot be corrected.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**6.6.3 Fractional Trade Correction – Category T Type O**

The Fractional Trade Correction message is similar to the Trade correction message and is used when the corrected Trade Volume is a fractional value. A non-fractional volume can be corrected to a fractional volume or vice-versa.

Message follows same validations as those applied to the Trade Correction (Category T Type C) message.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Corrected Sale Condition	4	Char [ ]
Corrected Trade Price	8	Long
Corrected Fractional Trade Volume	8	Long
Corrected Seller's Sale Days	1	Byte
Corrected Stock Stop Indicator	1	Char
Corrected Trade Through Exempt Indicator	1	Char
Corrected Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Timestamp 2	8	2 x Integer
Original Participant Reference Number <i>(of original transaction being corrected)</i>	8	Signed Long
<b>Total Length</b>	<b>53</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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#### 6.6.4 Long Trade – Category T Type L

The Long Trade message is used to report trade information for CTA eligible Equity, Local Issue or Bonds.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Trade Volume	4	Integer
Seller's Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Trade Reporting Facility ID	1	Char
Timestamp 2	8	2 x Integer
<b>Total Length</b>	<b>40</b>	

#### 6.6.5 Fractional Long Trade – Category T Type R

The Fractional Long Trade message is used to report trade information for CTA eligible Equity, Local Issue or Bonds in fractional volume.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Fractional Trade Volume	8	Long
Seller's Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Trade Reporting Facility ID	1	Char
Timestamp 2	8	2 x Integer
<b>Total Length</b>	<b>44</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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### 6.6.6 Trading Status – Category T Type S

Trading Status messages from a Participant are supported over input lines to both the CTS and the CQS system. The Trading Status message allows a Participant that is the listing exchange for CTA eligible Equity, Local Issue or Bond information which is included in the CTS database to notify CTS of Trading Halts, Resumes, Indications, Imbalances, Short Sale Restriction Indicators and Limit Up-Limit Down Reference Prices. A non-listing exchange can enter a Trading Status message to notify non-regulatory Halts, Resumes, trading range indication (if the stock is **not** halted) and a price indication (if the stock **is** halted for either a regulatory or non-regulatory reason).

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Last Price / Opening (Reopening) LULD Reference Price	8	Long
High Indication Price / Upper Limit Price Band	8	Long
Low Indication Price / Lower Limit Price Band	8	Long
Buy Volume	4	Integer
Sell Volume	4	Integer
Security Status	1	Char
Halt Reason	1	Char
Short Sale Restriction Indicator	1	Char
Trading Status ID	4	Integer
<b>Total Length</b>	<b>51</b>	

**Note:**

- The Trading Status message is applicable to the Listing Exchange of the issue designated by the symbol in **SECURITY SYMBOL** field. Only certain Trading Status messages received from non-Listing Exchanges are accepted: 1) halts for non-Regulatory halt reason (code I, X or Y) are accepted; 2) resume for non-Regulatory halt are accepted; 3) if a stock is not halted, only Trading Range Indications are accepted; 4) if a stock is halted, only Price Indications are accepted. All other Trading Status messages from non-Listing Markets are rejected back to the Participant.
- The ‘Trading Status ID’ field on Trading Status messages is used to perform a duplicate check. A Trading Status message with a duplicate ‘Trading Status ID’ is ignored. As such, the field must have a unique value for each subsequent Trading Status update per symbol.

**Trading Status – Category T Type S (continued)**

- To achieve redundancy Participants should disseminate Trading Status Messages to both CTS and CQS.
  - All Trading status updates shall be submitted in respectively same sequence across CQS and CTS input line
  - The Participant must provide the same value for the ‘Trading Status ID’ field when publishing the same Trading Status update across both CTS and CQS input lines.
- ‘Limit Up-Limit Down’ is not applicable to Local Issues or Bonds.
- When Opening or Reopening a security symbol, Primary Listing Exchange must submit Trade status message to report the ‘Limit Up-Limit Down Reference Prices’ via the field ‘Last Price/Opening (Reopening) LULD Reference Price’ to CTA for establishing the LULD Price bands. This shall be reported whether there is an opening (reopening) trade or not.
- The Last Price/Opening (Reopening) LULD Reference Price field will be rejected back to a Participant to denote an **‘Invalid LULD Reference Price’** as follows:
  - A valid Trading Status Message is received containing an invalid ‘LULD Reference Price’ value (e.g., alpha vs. numeric).
  - Reference Price of LULD Price Bands was already established prior to receiving the message
  - If it is received for a security symbol that is not LULD eligible

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**6.6.7 Short Trade – Category T Type T**

The Short Trade message is used to report trade information for **CTA eligible Equity**, Local Issues or Bonds, if the trade meets all the criteria and message format requirements, otherwise Long Trade message is used

Field Name	Length	Type
Security Symbol	5	Char [ ]
Sale Condition	1	Char
Sale Condition Category	1	Char
Trade Price	2	Short
Trade Volume	2	Short
Reserved	3	TBD
<b>Total Length</b>	<b>14</b>	

**6.6.8 Fractional Short Trade – Category T Type H**

The Fractional Short Trade message is used to report trade information with fractional volume. Input data Participants can use this message if the trade meets all the criteria and message format requirements, otherwise Long Trade or Fractional Long Trade message shall be used.

Field Name	Length	Type
Security Symbol	5	Char [ ]
Sale Condition	1	Char
Sale Condition Category	1	Char
Trade Price	2	Short
Fractional Trade Volume	4	Integer
Reserved	3	TBD
<b>Total Length</b>	<b>16</b>	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**6.6.9 Trade Cancel/Error – Category T Type X**

The Trade Cancel/Error message allows a Participant to perform automated cancellations or errors of trades reported during the current CTA session. A Participant Reference Number must be assigned to the original transaction that is to be corrected. The Participant Reference Number of trade being corrected must be unique by Participant ID, by Trade Reporting Facility (TRF), by Security Symbol and by Participant Regional Reference Number.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Trade Through Exempt Indicator	1	Char
Trade Reporting Facility ID	1	Char
Original Participant Reference Number <i>(of Original Transaction being cancelled or errored)</i>	8	Signed Long
Timestamp 2	8	2 x Integer
Cancel/Error Action	1	Char
<b>Total Length</b>	<b>31</b>	

**Note:**

- To identify a transaction being adjusted, the Participant Reference Number assigned to the original trade, or if the original trade has already been corrected, the Participant Reference Number of the most recent correction to the trade is to be reflected in the Participant Reference Number field of the Correction Message body. **Trades which have been cancelled or errored cannot be corrected.**

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT 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 supports a maximum price of \$92,233,720,368.547758. 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 supports a maximum price of \$92,233,720,368.547758. 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 supports a maximum price of \$92,233,720,368.547758. 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 TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description						
Bid Index Value	8	<p>Signed Long. Bid Index Value represents an <u>index value (i.e., not a price) and has 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>The Bid Index Value represents the value of the index’s calculation formula using the current Bid values of the component securities.</p> <p><b>Note:</b> For Government Bonds, the Bid Index Value could reflect a value that is greater than the Offer Index Value.</p>						
Buy Volume	4	<p>Integer. Integer has a maximum volume of 4,294,967,295. Optional set to zero.</p> <p>The Buy Volume represents the reported imbalance of buy orders without matching sell orders for the security for a Participant.</p>						
Cancel/Error Action	1	<p>Char.</p> <p>Denotes whether the referenced transaction is to be cancelled (buyer and seller agrees to cancel a trade) or errored (error a trade that never took place but was reported).</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #ADD8E6;">Code</th> <th style="background-color: #ADD8E6;">Value</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Cancel</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Error</td> </tr> </tbody> </table>	Code	Value	1	Cancel	2	Error
Code	Value							
1	Cancel							
2	Error							
Closing Bid Price	8	<p>Long. Long have implied 6 decimal places and supports a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The Closing Bid Price represents the last qualifying quote for a security by a Participant during the trading day.</p>						

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Closing Offer Price	8	<p>Long. Long have implied 6 decimal places and supports a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The Closing Offer Price represents the last qualifying quote for a security by a Participant during the trading day.</p>
Corrected ( <i>followed by</i> 'NAME OF FIELD')	Variable	Refer to the field name following the word 'Corrected' for field description. A field defined as 'Corrected' represents the specific field(s) possible new value for a trade that has been corrected.
Crossing Session I Total Trades Volume	8	<p>Long. Long have a maximum volume of 184,467,440,737,095,516. Optional set to zero.</p> <p>Contains the number of shares traded at the Participant's close price and taking place after the close of a Participant's regular session.</p>
Crossing Session II Dollar Value	8	<p>Long. Long have implied 6 decimal places and supports a maximum value of \$92,233,720,368.547758. Optional set to zero.</p> <p>Contains the Dollar Value traded after the close of a Participant's regular session.</p>
Crossing Session II Total Trades Volume	8	<p>Long. Long have a maximum volume of 184,467,440,737,095,516. Optional set to zero.</p> <p>Contains the number of shares traded after the close of a Participant's regular session. Crossing Session II is designed to facilitate trading between member firms.</p>
Dollar Value	8	<p>Long. Long have implied 6 decimal places and supports a maximum value of \$92,233,720,368.547758. Optional set to zero.</p> <p>The Dollar Value represents the total dollar worth of the daily trade transactions.</p>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

<b>Field Name</b>	<b>Length</b>	<b>Description</b>
Fractional Trade Volume	4 or 8	<p>4 Integer. Field has implied 6 decimal places for a maximum volume of 4294.967295 shares.</p> <p>8 Long. Field has implied 6 decimal places and a maximum volume of 18,446,744,073,709.551615 shares. Optional set to zero.</p> <p>The Fractional Trade Volume contains the total number of shares (represented in fraction) which traded in a single transaction for an individual security.</p>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																																																																								
Halt Reason	1	<p>Char.</p> <p>Denotes the reason for the Trading Halt.</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th style="background-color: #ADD8E6;">Code</th> <th style="background-color: #ADD8E6;">Value</th> <th style="background-color: #ADD8E6;">Regulatory</th> <th style="background-color: #ADD8E6;">Non Regulatory</th> </tr> </thead> <tbody> <tr> <td>Space</td> <td>Halt Reason Not Applicable</td> <td></td> <td></td> </tr> <tr> <td>A</td> <td>SIP Outage, Material SIP Latency, or Extraordinary Market Activity</td> <td>X</td> <td></td> </tr> <tr> <td>C</td> <td>Regulatory Concern</td> <td>X</td> <td></td> </tr> <tr> <td>D</td> <td>News Released (formerly News Dissemination)</td> <td>X</td> <td></td> </tr> <tr> <td>E</td> <td>Merger Effective</td> <td>X</td> <td></td> </tr> <tr> <td>F</td> <td>ETF Component Prices Not Available</td> <td>X</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>N</td> <td>Corporate Action</td> <td>X</td> <td></td> </tr> <tr> <td>O</td> <td>New Security Offering</td> <td>X</td> <td></td> </tr> <tr> <td>P</td> <td>News Pending</td> <td>X</td> <td></td> </tr> <tr> <td>V</td> <td>Intraday Indicative Value Not Available</td> <td>X</td> <td></td> </tr> <tr> <td>X</td> <td>Operational</td> <td></td> <td>X</td> </tr> <tr> <td>Y</td> <td>Sub-Penny Trading</td> <td></td> <td>X</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> </tbody> </table> <p style="color: red; margin-left: 40px;">Note 1: For a symbol in regulatory halt, halt state persists in CTA until a Resume is received from the Participant. If not Resumed at the end of a session, halt state is carried over and disseminated at the beginning of next session.</p> <p style="color: red; margin-left: 40px;">Note 2: For a symbol in non-regulatory halt state, if Resume is not received from the Participant, halt state is reset at the end of the session. A state change is not disseminated by CTA for the next session.</p>	Code	Value	Regulatory	Non Regulatory	Space	Halt Reason Not Applicable			A	SIP Outage, Material SIP Latency, or Extraordinary Market Activity	X		C	Regulatory Concern	X		D	News Released (formerly News Dissemination)	X		E	Merger Effective	X		F	ETF Component Prices Not Available	X		I	Order Imbalance		X	M	Limit Up-Limit Down (LULD) Trading Pause	X		N	Corporate Action	X		O	New Security Offering	X		P	News Pending	X		V	Intraday Indicative Value Not Available	X		X	Operational		X	Y	Sub-Penny Trading		X	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	
Code	Value	Regulatory	Non Regulatory																																																																							
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P	News Pending	X																																																																								
V	Intraday Indicative Value Not Available	X																																																																								
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3	Market-Wide Circuit Breaker Level 3 – Breached	X																																																																								

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
High Indication Price / Upper Limit Price Band	8	<p>Long. Long have implied 6 decimal places and supports a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The High Indication Price represents an approximation of what the high end ‘Offer’ price of a security’s trading range may be. It is used for a security that is not Trading Halted, i.e., Trading Range Indication or following a Trading Halt, i.e., Price Indication.</p> <p><b>Note:</b> For Government Bonds, the High Indication Price (i.e., Bid) could reflect a value that is greater than the Low Indication Price (i.e., Offer).</p> <p>The <b>Upper Limit Price Band</b> represents the Listing Exchange’s last effective LULD Price Band Price that triggered the preceding Limit State that led to the LULD Trading Pause. Used in conjunction with the ‘Security Status’ field set to ‘Trading Halt’ and the ‘Halt Reason’ field set to ‘Limit-Up-Limit Down (LULD) Trading Pause’. If Upper Limit Price Band is non-zero, the Lower Limit Price Band is zero.</p>
High Price	8	<p>Long. Long have implied 6 decimal places and supports a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The High Price represents the highest price paid for a security during the trading day.</p> <p><b>Note:</b> In instances when no trades qualify to be included in the “High” calculation, either on a Consolidated or an individual Participant basis, this field is set to zero.</p>
Index Symbol	11	<p>Char [11]. Left justified, space-filled.</p> <p>Contains the Index symbol.</p>
Index Value	8	<p>Signed Long. Index Value represents an <u>index value (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.</p> <p>The Index Value represents a statistical composite that measures changes in the economy or in financial markets.</p>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description										
Instrument Type	1	<p>Char.</p> <p>Identifies the instrument type relevant to the trade.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #e0f2f1;">Code</th> <th style="background-color: #e0f2f1;">Value</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>CTA Eligible Equity</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Local Issue</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Corporate Bond</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Government Bond</td> </tr> </tbody> </table> <p><b>Note:</b> Message is rejected if field value does not match the configured setting for the underlying symbol</p>	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											
3	Government Bond											
Last Price	8	<p>Long. Long have implied 6 decimal places and supports a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The Last Price represents the last price for that security either on a Consolidated or an individual Participant basis at the time it is disseminated.</p> <p><b>Note 1:</b> For Trading Status Information, the Last Price is provided when the Security Status is either a Trading Halt, Price Indication or Trading Range Indication.</p> <p><b>Note 2:</b> In instances when no trades qualify to be included in the ‘Last’ calculation, either on a Consolidated or an individual Participant basis, the Last Price will reflect the most current Last Price, e.g., the previous close, or, if no previous close exists, Last Price is set to zero.</p>										
Last Price / Opening (Reopening) LULD Reference Price	8	<p>Long. Long have implied 6 decimal places and supports a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The Last Price represents the last price for that security either on a Consolidated or an individual Participant basis at the time it is disseminated.</p> <p><b>Opening (Reopening) LULD Reference Price:</b> The Opening (Reopening) LULD Reference Price is used by the listing exchange to report the reference price for LULD Price Bands to SIP, regardless of whether it is Opening (Reopening) the security symbol with a quote or a trade.</p> <p>Used in conjunction with ‘Security Status’ field code set to Limit Up-Limit Down (LULD) Reference Price, with the Opening (Reopening) LULD reference price value contained in the Last Price/Opening (Reopening) LULD Reference Price field.</p>										

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Low Indication Price / Lower Limit Price Band	8	<p>Long. Long have implied 6 decimal places and supports a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The <b>Low Indication Price</b> represents an approximation of what the low end “Bid” price of a security’s trading range may be. It is used for a security that is not Trading Halted, i.e., Trading Range Indication or following a Trading Halt, i.e., Price Indication.</p> <p><b>Note:</b> For Government Bonds, the High Indication Price (i.e., Bid) could reflect a value that is greater than the Low Indication Price (i.e., Offer).</p> <p>The <b>Lower Limit Price Band</b> represents the Listing Exchange’s last effective LULD Price Band Price that triggered the preceding Limit State that led to the LULD Trading Pause. Used in conjunction with the ‘Security Status’ field set to ‘Trading Halt’ and the ‘Halt Reason’ field set to ‘Limit-Up-Limit Down (LULD) Trading Pause’. If Lower Limit Price Band is non-zero, the Upper Limit Price Band is zero.</p>
Low Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The Low Price represents the lowest price paid for a security during the trading day.</p> <p><b>Note:</b> In instances when no trades qualify to be included in the “Low” calculation, either on a Consolidated or an individual Participant basis, this field is set to zero.</p>
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.</p>
Offer Index Value	8	<p>Signed Long. Offer Index Value represents an <u>index value (i.e., not a price) and has 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>Represents the value of the index’s calculation formula using the current offer values of the component securities.</p> <p><b>Note:</b> For Government Bonds, the Bid Index Value could reflect a value that is greater than the Offer Index Value.</p>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Open Price	8	<p>Long. Long have implied 6 decimal places and supports a maximum price of \$92,233,720,368.547758. Optional set to zero.</p> <p>The Open Price represents the first qualifying price paid for a security during the trading day.</p> <p><b>Note:</b> In instances when no trades qualify to be included in the ‘Open Price’ calculation, either on a Consolidated or an individual Participant basis, this field is set to zero.</p>
Original (followed by ‘NAME OF FIELD’)	Variable	<p>Refer to the field name following the word ‘Original’ for field description. In messages containing two sets of identical fields, one set of fields is used to denote the original trade detail when it was executed and the other set of fields is to denote the corrected field(s) originally reported incorrectly.</p>
Participant Reference Number (of trade being corrected or cancelled or errored)	8	<p>Signed Long. Set to Zero.</p> <p>Contains the Participant Reference Number of transaction to be corrected, cancelled or errored.</p> <p>The Participant Reference Number must correspond to the Participant Reference number in the Message Header of the transaction being corrected, cancelled or errored. If the trade has already been corrected, the Participant Reference Number of the most recent correction to the trade is required. Corrections, Cancels or Errors entered for trades which have already been canceled or errored will be rejected back to the Participant.</p>
Prior Day Trade Date and Time	8	<p>2 x Integer (pair of Integers). Optional set to zero.</p> <p>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).</p> <p>Represents the date and time the prior day trade was executed. In the Prior Day Correction messages, there are two Prior Day Trade Dates and Time, one to denote the date and time the original trade was executed as reported in a Prior Day Trade and one to denote the corrected date and time of trade execution. In the Prior Day Cancel/Error messages, the date and time denotes the reported execution date of the original trade being cancelled or reported in error.</p>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Sale Condition	1 or 4	Char. Or Char [4].  Denotes the sale condition associated with a trade. Also noted is the impact of Sale Conditions on the Open, Last, High and Low calculations both on a Consolidated and Participant basis.

		CONSOLIDATED Update		PARTICIPANT Update			VOLUME Update
CODE	SALE CONDITION	LAST	HIGH/LOW	OPEN	LAST	HIGH/LOW	
Space	Regular Sale	YES	YES	#4	YES	YES	YES
B	Average Price Trade	NO	NO	NO	NO	NO	YES
C	Cash Trade (Same Day Clearing)	NO	NO	NO	NO	NO	YES
E	Automatic Execution	YES	YES	#4	YES	YES	YES
F	Inter-market Sweep Order	YES	YES	#4	YES	YES	YES
H	Price Variation Trade	NO	NO	NO	NO	NO	YES
I	Odd Lot Trade	NO	NO	NO	NO	NO	YES
K	Rule 127 (NYSE Only) <i>or</i> Rule 155 (NYSE American only)	YES	YES	#4	YES	YES	YES
L	Sold Last (Late Reporting)	#3	YES	#4	YES	YES	YES
M	Market Center Official Close	NO	NO	NO	YES	YES	NO
N	Reserved	NO	NO	NO	NO	NO	TBD
O	Market Center Opening Trade	YES	YES	YES	YES	YES	YES
P	Prior Reference Price	#2	YES	#4	#2	YES	YES
Q	Market Center Official Open	NO	NO	YES	NO	YES	NO
R	Seller	NO	NO	NO	NO	NO	YES
T	Extended Hours Trade	NO	NO	NO	NO	NO	YES
U	Extended Hours Sold (Out Of Sequence)	NO	NO	NO	NO	NO	YES
V	Contingent Trade	NO	NO	NO	NO	NO	YES
X	Cross / Periodic Auction Trade	YES	YES	#4	YES	YES	YES
Z	Sold (Out Of Sequence)	#2	YES	#4	#2	YES	YES
4	Derivatively Priced	#2	YES	#4	#2	YES	YES
5	Market Center Reopening Trade	YES	YES	#4	YES	YES	YES
6	Market Center Closing Trade	YES	YES	#4	YES	YES	YES
7	Qualified Contingent Trade	NO	NO	NO	NO	NO	YES
8	Reserved	NO	NO	NO	NO	NO	TBD
9	Corrected Consolidated Close Price as per Listing Market	YES	YES	NO	NO	NO	NO

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

**SALE CONDITION, *continued***

Deviations from a trade’s qualification for the Open, Last, High and Low calculations both on a Consolidated and individual Participant basis are denoted with a number (i.e., **Notes #2, #3 and #4**) in the above calculation chart and are described below:

**‘OPEN’, ‘LAST’, ‘HIGH’, ‘LOW’ CALCULATIONS**

<b>Note 1</b> <i>(currently not in use for any sale condition)</i>	<b>YES</b> , if it is the only qualifying last; <b>OR</b> If it is that Participant’s first qualifying last; <b>OTHERWISE NO</b>
<b>Note 2</b>	<b>YES</b> , if it is the only qualifying last; <b>OTHERWISE NO</b>
<b>Note 3</b>	<b>YES</b> , if it is the only qualifying last; <b>OR</b> If it is from the same participant as the last; <b>OR</b> If it is from the LISTING MARKET for that Security; <b>OTHERWISE NO</b>
<b>Note 4</b>	<b>YES</b> , if it is the first qualifying or only qualifying trade of the day; <b>OTHERWISE NO.</b>

In instances of multiple sale conditions, the following criteria will be used to determine the impact of the Sale Conditions on the Open, Last, High, and Low calculations both on a Consolidated and individual Participant basis:

**MULTIPLE SALE CONDITION ‘OPEN’, ‘LAST’, ‘HIGH’, ‘LOW’ CALCULATIONS**

- If all of the Sale Conditions indicate that the trade qualifies, it **will** be included in the calculations.
- If **any one or all** of the Sale Conditions indicate ‘**NO**’, the trade **does not qualify**, the ‘**NO**’ takes precedence and the trade **will not** be included in the calculations.
- If **all** of the Sale Conditions indicate that the trade qualifies, including a Sale Condition whose criteria deviates from a trade’s qualification (i.e., above **Notes #2, #3 and #4**) the trade qualifies, the ‘Note Criteria’ takes precedence and the trade **will** be included in the calculations.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Sale Condition, <i>continued</i>	1 or 4	Char. Or Char [4].  Denotes a particular condition applicable to the trade. The Short Trade format 'Sale Condition Category' field identifies the Category 1, 2, 3 or 4 level associated with a trade.

The Participant Input four (4) Char Sale Condition field is **Char specific** whereby a Sale Condition from Category 1 should be in the first Char position, a Sale Condition from Category 2 should be in the second Char position, a Sale Condition from Category 3 should be in the third Char position and a Sale Condition from Category 4 should be in the fourth Char position. If a Sale Condition is populated out of its designated position, the associated message will be rejected. If a Sale Condition is not required from any one of the categories, the unused Sale Condition Char should be space-filled. The Category hierarchy in the 4 Char Sale Condition field is currently as

Category 1 Settlement Type	Category 2 Reason for Trade-Through Exemption / Other Reason	Category 3 Extended Hours / Sequence Type	Category 4 SRO Trade Detail
<b>Space</b> (Regular Settlement)	<b>Space</b> (No Trade Through Exempt Reason)	<b>Space</b> (Not Extended Hours or Sold Out of Sequence)	<b>Space</b> (No SRO Required Trade Detail)
<b>C</b> Cash Trade (Same Day Clearing)	<b>F</b> Inter-market Sweep Order	<b>L</b> Sold Last (Late Reporting)	<b>B</b> Average Price Trade
<b>N</b> Reserved	<b>O</b> Market Center Opening Trade	<b>T</b> Extended Hours Trade	<b>E</b> Automatic Execution
<b>R</b> Seller	<b>4</b> Derivatively Priced	<b>U</b> Extended Hours Sold (Out of Sequence)	<b>H</b> Price Variation Trade
	<b>5</b> Market Center Reopening Trade	<b>Z</b> Sold (Out of Sequence)	<b>I</b> Odd Lot Trade
	<b>6</b> Market Center Closing Trade		<b>K</b> Rule 127 (NYSE only) or Rule 155 (NYSE American only)
	<b>7</b> Qualified Contingent Trade		<b>M</b> Market Center Official Close
	<b>8</b> Reserved		<b>P</b> Prior Reference Price
	<b>9</b> Corrected Consolidated Close Price as per Listing Market		<b>Q</b> Market Center Official Open
			<b>V</b> Contingent Trade
			<b>X</b> Cross / Periodic Auction Trade

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

**SALE CONDITION, *continued***

**Note 1:**

- Sale Conditions within the same category are mutually exclusive (e.g., Sale Conditions C or R **cannot** be used in combination).

**Note 2:**

- Sale Condition U (Extended Hours Sold – Out of Sequence) **cannot** be used in combination with any of the Sale Conditions listed in Category 2 – Reason for Trade-Through Exemption (Rule 611).

**Note 3:**

- Sale Conditions L (Sold Last – Late Reporting), O (Market Center Opening Trade), P (Prior Reference Price), and Z (Sold – Out of Sequence), are mutually exclusive of each other (i.e., these sale conditions **cannot** be used in combination).

Additional Sale Condition notes:

- Trade with Sale condition ‘9’ (Corrected Consolidated Close Price) must have Volume set as zero. These trades are only allowed from the Listing Exchange of the symbol, with earliest reporting time of 30 seconds after the market close time.
- Trade with Sale Condition ‘I’ (Odd Lot Trade) must have Volume less than the symbol round lot size
- Trade with Sale Condition ‘M’ (Market Center Official Close) is used to indicate the official closing value as determined by a market center. Such trades can have Volume less, equal or more than the symbol Round Lot size
- Trades with Sale Condition ‘Q’ (Market Center Official Close) is used to indicate the official open value as determined by a market center. Such trades can have Volume less, equal or more than the symbol Round Lot size

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**SALE CONDITION, *continued***

**Rule 611- Trade Reporting Matrix**

Rule	Short Name	Description	TTE Field	Sales Condition Field				
			611 Exemption	Settlement Type	Reason for 611 Exemption	Extended Hours/Sold	SRO Required Detail	
			Level 1	Level 2	Level 3	Level 4	Level 5	
611b1	Self Help	The transaction that constituted the trade-through was effected when the trading center displaying the protected quotation that was traded through was experiencing a failure, material delay, or malfunction of its systems or equipment.	YES	N/A	N/A	N/A	TBD by each SRO	
611b2	Not Regular Way	The transaction that constituted the trade-through was not a “regular way” contract.	YES	YES	N/A	N/A	TBD by each SRO	
611b3	Single Price Opening	The transaction that constituted the trade-through was a single-priced opening transaction by the trading center.	YES	N/A	<b>0</b> MARKET CENTER OPENING TRADE	N/A	TBD by each SRO	
611b3	Single Price Reopening	The transaction that constituted the trade-through was a single-priced reopening transaction by the trading center.	YES	N/A	<b>5</b> MARKET CENTER REOPENING TRADE	N/A	TBD by each SRO	
611b3	Single Price Closing	The transaction that constituted the trade-through was a single-priced closing transaction by the trading center.	YES	N/A	<b>6</b> MARKET CENTER CLOSING TRADE	N/A	TBD by each SRO	
611b4	Crossed Market	The transaction that constituted the trade-through was executed at a time when a protected bid was priced higher than a protected offer in the NMS stock.	YES	N/A	N/A	N/A	TBD by each SRO	
611b5	Inter-market Sweep	The transaction that constituted the trade-through was the execution of an order identified as an inter-market sweep order.	YES	N/A	<b>F</b> INTERMARKET SWEEP	N/A	TBD by each SRO	
611b6	Inter-market Sweep	The transaction that constituted the trade-through was effected by a trading center that simultaneously routed an inter-market sweep order to execute against the full displayed size of any protected quotation in the NMS stock that was traded through.	YES	N/A	<b>F</b> INTERMARKET SWEEP	N/A	TBD by each SRO	

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

SALE CONDITION, *continued*

**Rule 611- Trade Reporting Matrix, *continued***

Rule	Short Name	Description	TTE Field	Sales Condition Field			
			611 Exemption	Settlement Type	Reason for 611 Exemption	Extended Hours/Sold	SRO Required Detail
			Level 1	Level 2	Level 3	Level 4	Level 5
611b7	Derivatively Priced	The transaction that constituted the trade-through was the execution of an order at a price that was not based, directly or indirectly, on the quoted price of the NMS stock at the time of execution and for which the material terms were not reasonably determinable at the time the commitment to execute the order was made.	YES	N/A	4 DERIVATIVELY PRICED	N/A	TBD by each SRO
611b9	Stopped Stock	The transaction that constituted the trade-through was the execution by a trading center of an order for which, at the time of receipt of the order, the trading center had guaranteed an execution at no worse than a specified price (a "stopped order"), where: (i) The stopped order was for the account of a customer; (ii) The customer agreed to the specified price on an order-by-order basis; and (iii) The price of the trade-through transaction was, for a stopped buy order, lower than the national best bid in the NMS stock at the time of execution or, for a stopped sell order, higher than the national best offer in the NMS stock at the time of execution.	YES	N/A	4 DERIVATIVELY PRICED	N/A	TBD by each SRO

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																																		
Sale Condition Category	1	<p>Char.</p> <p>In the Short Trade format, identifies the Sale Condition Category level associated with a trade. Sale Condition Categories are defined in the 'Sale Condition' field description.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Code</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Space</td> <td>Sale Condition Category Not Applicable</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Sale Condition Category 1</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Sale Condition Category 2</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Sale Condition Category 3</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Sale Condition Category 4</td> </tr> </tbody> </table> <p>Note: Sale condition specified on a Short Trade message must belong to the specified Sale Condition Category</p>	Code	Value	Space	Sale Condition Category Not Applicable	1	Sale Condition Category 1	2	Sale Condition Category 2	3	Sale Condition Category 3	4	Sale Condition Category 4																						
Code	Value																																			
Space	Sale Condition Category Not Applicable																																			
1	Sale Condition Category 1																																			
2	Sale Condition Category 2																																			
3	Sale Condition Category 3																																			
4	Sale Condition Category 4																																			
Security Status	1	<p>Char.</p> <p>Represents the trading action related to the transaction.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Code</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Space</td> <td>Security Status Not Applicable</td> </tr> <tr> <td style="text-align: center;">1*</td> <td>Reserved</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Trading Halt</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Resume</td> </tr> <tr> <td style="text-align: center;">4*</td> <td>Reserved</td> </tr> <tr> <td style="text-align: center;">5</td> <td>Price Indication</td> </tr> <tr> <td style="text-align: center;">6</td> <td>Trading Range Indication</td> </tr> <tr> <td style="text-align: center;">7</td> <td>Market Imbalance Buy</td> </tr> <tr> <td style="text-align: center;">8</td> <td>Market Imbalance Sell</td> </tr> <tr> <td style="text-align: center;">9</td> <td>Closing Imbalance Buy</td> </tr> <tr> <td style="text-align: center;">A</td> <td>Closing Imbalance Sell</td> </tr> <tr> <td style="text-align: center;">B*</td> <td>Reserved</td> </tr> <tr> <td style="text-align: center;">C</td> <td>No Market Imbalance</td> </tr> <tr> <td style="text-align: center;">D</td> <td>No Closing Imbalance</td> </tr> <tr> <td style="text-align: center;">E</td> <td>Short Sale Restriction</td> </tr> <tr> <td style="text-align: center;">F</td> <td>Limit Up-Limit Down (LULD) Reference Price</td> </tr> </tbody> </table> <p>* Reserved Security Status Indicator codes are not supported</p>	Code	Value	Space	Security Status Not Applicable	1*	Reserved	2	Trading Halt	3	Resume	4*	Reserved	5	Price Indication	6	Trading Range Indication	7	Market Imbalance Buy	8	Market Imbalance Sell	9	Closing Imbalance Buy	A	Closing Imbalance Sell	B*	Reserved	C	No Market Imbalance	D	No Closing Imbalance	E	Short Sale Restriction	F	Limit Up-Limit Down (LULD) Reference Price
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CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																														
Security Symbol	5 or 11	<p>Char [5] or Char [11]. Left justified, space-filled.</p> <p>Identifies the Security Symbol. CTS 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. 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>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 CTS Participant and Data Recipient can be tested prior to the opening or during the trading day.</p> <p>Messages with any of the dedicated test symbols will be included in Participant statistics (e.g., Open/High/Low/Last calculations), but will be excluded in volume counts, trade counts, etc. Start and End of Day Summary messages will be generated for dedicated test symbols. Alphanumeric Test Symbols are Reserved for future use.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #ADD8E6;">Listing Exchange</th> <th style="background-color: #ADD8E6;">Test Symbol</th> </tr> </thead> <tbody> <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>CTEST</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>NYSE Texas</td> <td>MTEST</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>01V thru 12V</td> </tr> </tbody> </table>	Listing Exchange	Test Symbol	NYSE	CBO	CBX	NTEST	01N thru 12N	NYSE American	CTEST	ATEST	01A thru 12A	NYSE Arca	IGZ	ZVV	ZZK	ZZZ	PTEST	01P thru 12P	NYSE Texas	MTEST	Cboe BZX	ZBZX	ZTEST	ZTST	01Z thru 12Z	IEX	ZIEXT	ZEXIT	ZXIET	01V thru 12V
Listing Exchange	Test Symbol																															
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	01P thru 12P																															
NYSE Texas	MTEST																															
Cboe BZX	ZBZX																															
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CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Sell Volume	4	<p>Integer. Integer has a maximum volume of 4,294,967,295.</p> <p>The Sell Volume represents the reported imbalance of sell orders without matching buy orders for the security for a Participant.</p>
Seller's Sale Days	1	<p>Byte. Allowed values of Seller's Sale Days is 2 through 60 days. Optional set to zero.</p> <p>Sale Condition must be 'R' when specifying the Seller's Sale Days on a trade. Seller's Sale Day is not less than two business days after trade date and not more than sixty days after trade date.</p> <p>Specifies the number of days that may elapse before delivery of the security.</p>
Short Sale Restriction Indicator	1	<p>Char.</p> <p>Identifies whether or not a Short Sale Restriction is in effect by the Primary Listing Market for a security.</p> <p><b>Day 1:</b> When a security's price decreases by 10% or more from the previous day's closing price, the primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Activated'.</p> <p><b>Day 2:</b> As the short sale restriction will remain in effect the day after activation, CTA updates the state to 'Continued' for the next day. The primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Continued' (anticipated prior to the primary listing market open). In the event a security's price decreases by an additional 10% or more from the previous day's closing price, the primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Activated' (reverts to Day 1).</p> <p><b>Day 3:</b> As the short sale restriction is to be lifted at the end of Day 2, CTA updates the state to 'Deactivated' for the next day. The primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Deactivated' (anticipated prior to the primary listing market open).</p>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description												
Short Sale Restriction Indicator, <i>continued</i>		<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Code</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Space</td> <td>Short Sale Restriction Not Applicable</td> </tr> <tr> <td style="text-align: center;">A</td> <td>Short Sale Restriction Activated</td> </tr> <tr> <td style="text-align: center;">C</td> <td>Short Sale Restriction Continued</td> </tr> <tr> <td style="text-align: center;">D</td> <td>Short Sale Restriction Deactivated</td> </tr> <tr> <td style="text-align: center;">E</td> <td>Short Sale Restriction in Effect</td> </tr> </tbody> </table> <p><b>Note 1:</b> Code values ‘Space’, ‘A’, ‘C’ and ‘D’ are to be used only in conjunction with the ‘Security Status’ field of the Category T, Type S (Trading Status) message.</p> <p><b>Note 2:</b> Code values ‘Space’ and ‘E’ are to be used only with Category P, Type L (Prior Day Long Trade) and Category P, Type X (Prior Day Cancel/Error) messages.</p> <p><b>Note 3:</b> Short Sale Restriction status changes when the Session for next trading day begins. E.g., a Short Sale Restriction state of Continued for a given symbol ends when the current session ends at 8:00 PM, and the state is updated to Deactivated when the next session starts at ~9:00 PM.</p>	Code	Value	Space	Short Sale Restriction Not Applicable	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 Applicable													
A	Short Sale Restriction Activated													
C	Short Sale Restriction Continued													
D	Short Sale Restriction Deactivated													
E	Short Sale Restriction in Effect													
Stop Stock Indicator	1	<p>Char.</p> <p>Identifies whether a trade is considered a stop stock at the time of the trade.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Code</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>Stop Stock Not Applicable</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Stop Stock</td> </tr> </tbody> </table>	Code	Value	0	Stop Stock Not Applicable	1	Stop Stock						
Code	Value													
0	Stop Stock Not Applicable													
1	Stop Stock													

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**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) or a FINRA Trade Reporting Facility-provided timestamp represented in terms of 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 should be set to zero. For any messages generated by CTS, e.g., Messages generated on behalf of a Participant, Price Band messages, Administrative messages, Control messages and Market Status 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 should be set to zero.</li> <li>▪ <b>If from the FINRA Alternative Display Facility (ADF) or a FINRA Trade Reporting Facility:</b> <ul style="list-style-type: none"> <li>▪ <b>If the FINRA ADF or a FINRA TRF</b> provides a proprietary feed of trades reported by the facility, then the FINRA facility will publish the time of the transmission as also published on the facility's proprietary trade feed. The ADF or TRF shall provide such times to the Processor in nanoseconds since Epoch.</li> <li>▪ <b>If the FINRA ADF or a FINRA TRF facility does not</b> have a proprietary trade feed then the Timestamp 2 field should be set to zero.</li> </ul> </li> </ul>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

<b>Field Name</b>	<b>Length</b>	<b>Description</b>
Total Trades	4	Integer. Integer has a maximum volume of 4,294,967,295. Optional set to zero.  Contains the total number of trade transactions executed from a Participant.
Trade 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 supports a maximum price of \$92,233,720,368.547758. Optional set to zero.  The Trade Price is the monetary value of an individual share of stock at the time of the trade.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																																						
Trade Reporting Facility ID	1	<p>Char. Space-filled.</p> <p>Identifies the Participant with whom a Trade Reporting Facility (TRF) has been formed.</p> <ul style="list-style-type: none"> <li>▪ If the Participant with which FINRA has formed a TRF is submitting transactions to CTS, the Participant will submit under its own Participant ID and populate the TRF Indicator field with a lower case <b>d</b>.</li> <li>▪ If FINRA is entering transactions on behalf of a TRF, it will identify the specific TRF in the TRF Indicator field.</li> <li>▪ In cases of Bonds and Local Issues, which are <b>not eligible for TRF</b> transactions, the TRF Identifier fields should be space-filled.</li> </ul> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #e1f5fe;">Code</th> <th style="background-color: #e1f5fe;">Value</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">Space</td><td>TRF Not Applicable</td></tr> <tr><td style="text-align: center;"><b>d</b></td><td><b>FINRA ADF</b></td></tr> <tr><td style="text-align: center;"><b>A</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>B</b></td><td><b>FINRA / NASDAQ TRF Chicago</b></td></tr> <tr><td style="text-align: center;"><b>C</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>D</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>I</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>J</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>K</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>M</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>N</b></td><td><b>FINRA / NYSE TRF</b></td></tr> <tr><td style="text-align: center;"><b>P</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>T</b></td><td><b>FINRA / NASDAQ TRF Carteret</b></td></tr> <tr><td style="text-align: center;"><b>V</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>W</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>X</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>Y</b></td><td><b>Not Currently Active</b></td></tr> <tr><td style="text-align: center;"><b>Z</b></td><td><b>Not Currently Active</b></td></tr> </tbody> </table>	Code	Value	Space	TRF Not Applicable	<b>d</b>	<b>FINRA ADF</b>	<b>A</b>	<b>Not Currently Active</b>	<b>B</b>	<b>FINRA / NASDAQ TRF Chicago</b>	<b>C</b>	<b>Not Currently Active</b>	<b>D</b>	<b>Not Currently Active</b>	<b>I</b>	<b>Not Currently Active</b>	<b>J</b>	<b>Not Currently Active</b>	<b>K</b>	<b>Not Currently Active</b>	<b>M</b>	<b>Not Currently Active</b>	<b>N</b>	<b>FINRA / NYSE TRF</b>	<b>P</b>	<b>Not Currently Active</b>	<b>T</b>	<b>FINRA / NASDAQ TRF Carteret</b>	<b>V</b>	<b>Not Currently Active</b>	<b>W</b>	<b>Not Currently Active</b>	<b>X</b>	<b>Not Currently Active</b>	<b>Y</b>	<b>Not Currently Active</b>	<b>Z</b>	<b>Not Currently Active</b>
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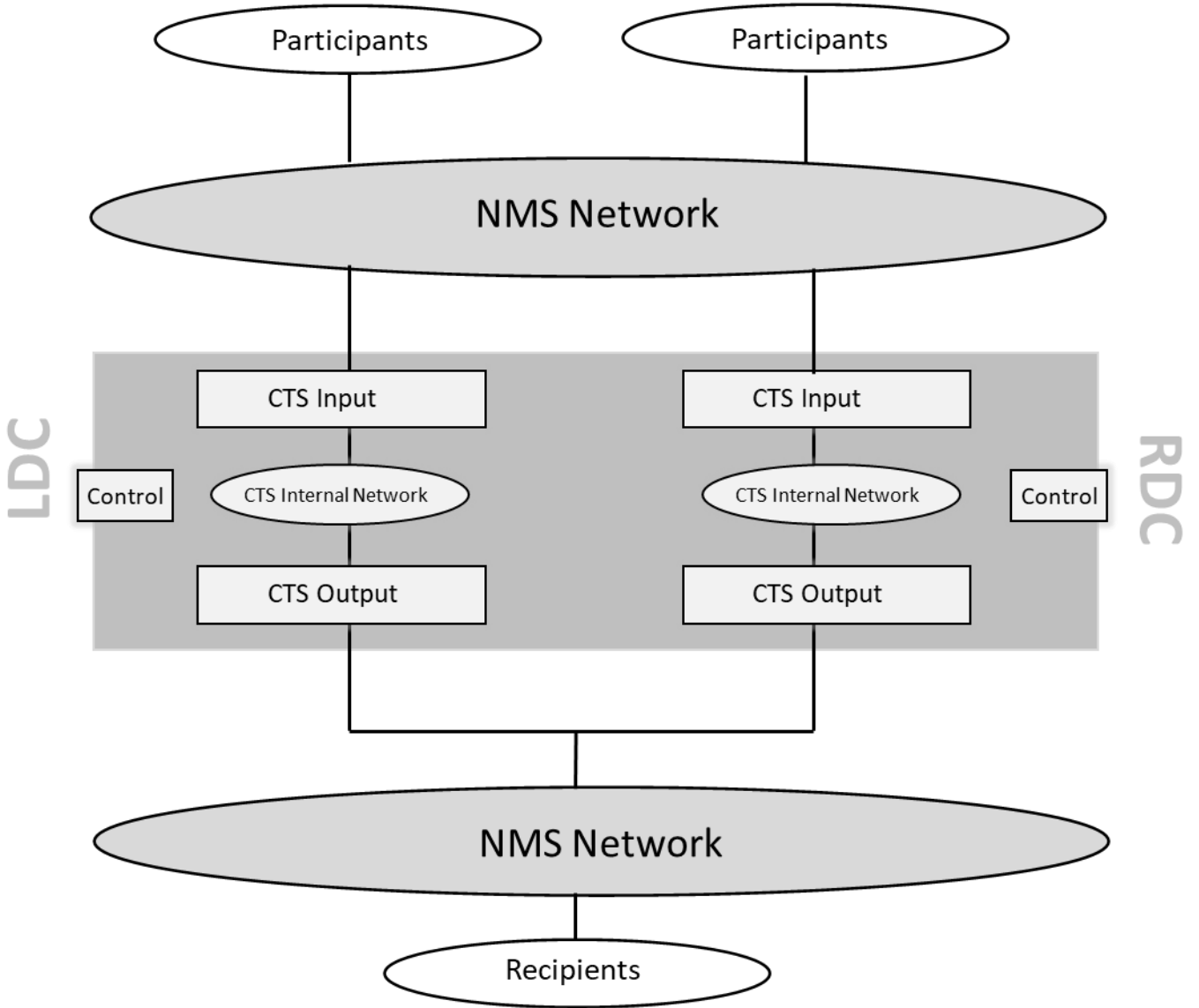
CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description						
Trade Through Exempt Indicator	1	<p>Char.</p> <p>Denotes whether or not a trade is exempt (Rule 611) and when used jointly with certain Sale Conditions, will more fully describe the characteristics of a particular trade.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Code</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>Not a Trade Through Exemption</td> </tr> <tr> <td style="text-align: center;">1</td> <td>Trade Through Exemption</td> </tr> </tbody> </table>	Code	Value	0	Not a Trade Through Exemption	1	Trade Through Exemption
Code	Value							
0	Not a Trade Through Exemption							
1	Trade Through Exemption							
Trade Total Volume	8	<p>Long. Long have a maximum volume of 184,467,440,737,095,516. Optional set to zero.</p> <p>Contains the total number of shares traded for an individual security.</p>						
Trade Volume	2 or 4	<p>2 Short. Short have a maximum volume of 65,535.</p> <p>4 Integer. Integer has a maximum volume of 4,294,967,295. Short or Integer Optional set to zero.</p> <p>Contains the total number of shares traded in a single transaction for an individual security.</p>						
Trading Status ID	4	<p>Integer.</p> <p>Contains identifier for each unique Trading Status Message.</p> <p>‘Trading Status ID’ on Trading Status Messages must contain a non-Zero value.</p> <p>Note: This field is used to eliminate duplicate Trading Status message received over CQS and CTS input lines. For every new Trading Status update, participants must provide a unique value for ‘Trading Status ID’ field per symbol. Any Trading Status message for a symbol containing a duplicate ‘Trading Status ID’ is ignored. For the same Trading Status update published across CQS and CTS input lines, Participant shall provide same value for ‘Trading Status ID’</p> <p>Note: There is no corresponding ‘Trading Status ID’ disseminated over the multicast feed.</p>						

APPENDIX A: CTS CONFIGURATION

CTS CONFIGURATION



CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX B: SYMBOL AND INDEX SUFFIX EXAMPLES**

	<b>Suffix</b>	<b>Description</b>
<b>A</b>	.A	Series (or Class) <b>A</b> - <i>Also</i> Series <b>B-Z</b>
	.A.CL	Series <b>A</b> Called - <i>Also</i> Series <b>B-Z</b>
	.A.CV	Series <b>A</b> Convertible - <i>Also</i> Series <b>B-Z</b>
	.Aw	Series <b>A</b> When Issued - <i>Also</i> Series <b>B-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 <sup>SM</sup>
	.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-Z</b>
	pA.CV	Preferred Series <b>A</b> Convertible - <i>Also</i> Series <b>B-Z</b>
	pA.CL	Preferred Series <b>A</b> Called - <i>Also</i> Series <b>B-Z</b>
	pAw	Preferred Series <b>A</b> When Issued - <i>Also</i> Series <b>B-Z</b>
	pw	Preferred When Issued
	p.CL	Preferred Called
	p.CV	Preferred Convertible
	p.CV.CL	Preferred Convertible Called
	p.WD	Preferred When Distributed
	pCA	Indicates Class <b>A</b> of a Second Category of Preferred - <i>Also</i> Class <b>B-K</b> and <b>M-S</b>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX B: SYMBOL AND INDEX SUFFIX EXAMPLES**

	<b>Suffix</b>	<b>Description</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-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 TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX C: GLOSSARY**

<b>Term</b>	<b>Description</b>
Automatic Execution	A sale condition code that identifies a NYSE trade that has been automatically executed without the potential benefit of price improvement.
Average Price Trade	A trade where the price reported is based upon an average of the prices for transactions in a security during all or any portion of the trading day.
Below Continuing Listing Standards	A financial status designation pertaining to Tape ‘A’ and Tape ‘B’ listed securities. The status identifies a company, whose issue 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 Trade	A transaction which requires delivery of securities and payment on the same day the trade takes place.
Closing Price	The Participant Closing Price represents the last qualifying trade paid for a security by a Participant during the trading day.
Contingent Trade	A Sale Condition code used to identify a transaction where the execution of the transaction is contingent upon some event.
Corrected Consolidated Close Price as per Listing Market	A transaction executed by the Listing Market to establish the official Consolidated Last Price as indicated by the Listing Exchange.
Cross / Periodic Auction Trade	Indicates that the trade resulted from a Market Center’s crossing session.
Crossed Market	The transaction that constituted the trade-through was executed at a time when a protected Bid was priced higher than a protected offer in the security.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

Term	Description
CTA Eligible Equity	Generally, any common stock, long-term warrant 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 for such securities.
Derivatively Priced	The transaction that constituted the trade-through was the execution of an order at a price that was not based, directly or indirectly, on the quoted price of the security at the time of execution, and for which the material terms were not reasonably determinable at the time the commitment to execute the order was made (REG NMS 611b7).
Dollar Value	The whole and decimal portion, if any, of the total dollar worth of the total daily trade transactions.
Ex-Distribution	Securities without the right to receive the forthcoming distribution of securities, which have been recently declared.
Ex-Dividend	Securities without the right to receive the forthcoming dividend recently declared.
Ex-Interest	Securities without the right to receive the forthcoming interest recently declared.
Ex-Rights	Securities without the right to buy a company's securities at a discount from the prevailing market price, which was distributed until a particular date. Typically, after that date, the rights trade separately from the security itself.
Extended Hours Trade	Identifies a trade that was executed outside of regular primary market hours and is reported as an extended hours trade.
Extended Hours Sold (Out of Sequence)	Identifies a trade that takes place outside of regular market hours and is reported as an extended hours trade out of sequence and at a time different from the actual transaction time.
Indication	An approximation of what a security's opening or reopening price range (Bid and Offer prices, no sizes) will be when trading resumes after a delayed opening or after a trading halt.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

Term	Description
Inter-market Sweep Order	The transaction that constituted the trade-through was the execution of an order identified as an Inter-market Sweep Order.
Late Filing	A financial status designation pertaining to Tape 'A' and Tape 'B' issues (i.e. issues listed on the NYSE, the NYSE American or on one of the Regional exchanges). The status identifies a company, which has failed to meet established listings standards for filing its annual reports.
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.
Limit Up-Limit Down (LULD) Price Bands	<p>The Limit Up-Limit Down Price Band published during Regular Trading Hours 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 style="color: red;">The Price Band will also be published overnight during the Extended Trading Hours starting at 9:00 PM and will be cleared at 4:00 AM.</p> <p>For further details related to Limit Up-Limit Down, reference the following: <a href="http://www.sec.gov/rules/sro/nms/2012/34-67091.pdf">http://www.sec.gov/rules/sro/nms/2012/34-67091.pdf</a></p> <p style="color: red;"><b>Note:</b> 'Limit Up-Limit Down' Price Bands during Regular Trading Hours are republished every 30 seconds at clock time. Overnight Price Bands during Extended Trading Hours are not republished unless being updated.</p>
Limit Up-Limit Down (LULD) Reference Price	Indicates the Reference Price provided by the listing exchange for LULD Price Band calculation when the listing exchange opens (reopens) a security symbol either with a quote or with a trade.
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.
Local Issue	A Local Issue is an issue that does not meet NYSE American Stock Market or NYSE listing requirements (is not CTA eligible) but is traded at one or more Regional Exchanges. Local Issues are included in the CTS database.
Market Center Closing Trade	The transaction that constituted the trade-through was a single priced closing transaction by the Market Center (REG NMS Rule 611b3).
Market Center Official Close	Indicates the 'Official' closing value as determined by a Market Center. This transaction report will contain the market center generated closing price.
Market Center Official Open	Indicates the 'Official' opening value as determined by a Market Center. This transaction report will contain the market center generated opening price.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

Term	Description
Market Center Opening Trade	The trade that constituted the trade-through was a single priced opening transaction by the Market Center (REG NMS Rule 611b3).
Market Center Reopening Trade	The trade that constituted the trade-through was a single priced reopening transaction by the Market Center (REG NMS Rule 611b3).
Market Imbalance Buy	A 50,000 share or more excess of market orders to buy over market orders to sell as of 9:00 a.m. on expiration days.
Market Imbalance Sell	A 50,000 share or more, excess of market orders to sell over market orders to buy as of 9:00 a.m. on expiration days.
Closing Imbalance Buy	Excess closing auction interest to buy, above a pre-defined threshold as determined by the primary listing market.
Closing Imbalance Sell	Excess closing auction interest to sell, above a pre-defined threshold as determined by the primary listing market.
Market-Wide Circuit Breaker Level 1 – 7% Breached	<p>This regulatory Trading Halt is used to denote that trading is suspended due to the S&amp;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:</p> <ul style="list-style-type: none"> <li>• Before 3:25 p.m. ET – duration 15 minutes</li> <li>• At or after 3:25 p.m. ET – trading shall continue unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.</li> </ul>
Market-Wide Circuit Breaker Level 2 – 13% Breached	<p>This regulatory Trading Halt is used to denote that trading is suspended due to the S&amp;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:</p> <ul style="list-style-type: none"> <li>• Before 3:25 p.m. ET – duration 15 minutes</li> <li>• At or after 3:25 p.m. ET – trading shall continue unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.</li> </ul>
Market-Wide Circuit Breaker Level 3 – 20% Breached	<p>This regulatory Trading Halt is used to denote that trading is suspended due to the S&amp;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.</p>

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

<b>Term</b>	<b>Description</b>
Mixed Lot	Number of shares greater than the symbol lot size, but not an exact multiple of the lot size. Mixed Lot is also known as ‘PRL’ or ‘partial round lot’ order and is comprised of a round lot order and an odd lot order. As an example, for a symbol with round-lot size of 40, Mixed Lot size can be 41-79, 81-119 and so on.
No Market Imbalance	Indicates that the imbalance of market orders for a security is less than 50,000 shares as of 9:00 a.m. on expiration day.
No Closing Imbalance	Excess closing auction interest to buy or sell is less than the pre-defined threshold determined by the primary listing market.
Non-Regulatory Halt or Delay	An operational Trading Halt for a Participant due to Order Imbalance, Operational.
Not-Regular Way	The transaction that constituted the trade-through was not a ‘regular way’ contract.
Odd Lot	Odd lot size for a symbol is considered to be any number of shares <i>less than</i> the symbol round lot size. As an example, for a symbol with round-lot size of 40, Odd Lot size can be 1-39.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

Term	Description
One or Two Point Rule	A trade must receive Floor Official approval and be published on the tape as 'opened' or 'sold last' if it is: <ul style="list-style-type: none"> <li>• one point or more away from the last sale when the last sale is under \$20.00; or</li> <li>• two points or more away from the last sale when the last sale is \$20.00 or more</li> </ul>
Opening/Reopening Trade Detail	An Opening/Reopening Trade Detail report indicates the trade was included as part of an opening or reopening transaction previously reported by a Participant on an aggregate basis.
Operational	Denotes a non-regulatory Trading Halt. The ability to trade a security by a Participant is temporarily inhibited due to technical reasons.
Order Imbalance	Denotes a non-regulatory halt condition where there is a significant imbalance of buy or sell orders.
Price Indication	Reflects an approximate price range of what a security's trading range (Bid and Offer prices) will be when trading resumes after a Trading Halt.
Price Variation Trade	Indicates a regular market session trade transaction that carries a price that is significantly away from the prevailing consolidated or primary market value at the time of the transaction.
Prior Reference Price	A sale condition that identifies a trade based on a price at a prior point in time, i.e., more than 90 seconds prior to the time of the trade report. The execution time of the trade will be the time of the prior reference price.
Qualified Contingent Trade	A transaction consisting of two or more component orders executed as agent or principal where the execution of one component is contingent upon the execution of all other components at or near the same time and the price is determined by the relationship between the component orders and not the current market price for the security.
Regular Sale	A trade made without stated conditions is deemed regular way for settlement on the third business day following the transaction date.
Regular Trading Hours	Comprises of core session trading hours between 9:30 AM until 4:00 PM

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

Term	Description
Regulatory Halt - Corporate Action	Denotes a regulatory trading halt when the primary market determines a halt is necessary pending the outcome of a Corporate Action event. Trading is suspended until the results of the Corporate Action are confirmed and the security is suitable for trading.
Regulatory Halt - ETF Component Prices Not Available	Denotes a regulatory trading halt when a significant percentage of an ETF's weight is invested in components in which pricing is not available. Trading is suspended until the primary market determines that such condition no longer exists.
Regulatory Halt - Intraday Indicative Value Not Available	Denotes a regulatory trading halt when the Intraday Indicative Value of an ETF is not being disseminated or is being disseminated incorrectly. Trading is suspended until the primary market determines that such condition no longer exists.
Regulatory Halt - Merger Effective	Denotes a regulatory trading halt in connection with a security being suspended in connection with a merger. Trading is suspended indefinitely.
Regulatory Halt - New Security Offering	Denotes a regulatory trading halt in connection with a new security offering. Trading is suspended until the new security is admitted to trading on the primary listing exchange during the primary trading session.
Regulatory Halt - News Pending	Denotes a regulatory Trading Halt due to an expected news announcement, which may influence the security. A Trading Halt may be continued once the news has been disseminated.
Regulatory Halt - News Released	Denotes a regulatory trading halt when relevant news influencing the security is being disseminated. Trading is suspended until the primary market determines that an adequate time has passed to allow for full dissemination of the news into the market.
Regulatory Halt - Regulatory Concern	Denotes a regulatory trading halt due to an ongoing regulatory concern regarding the suitability of trading in a security. Trading is suspended until the primary market determines the security is suitable for trading.
Regulatory Halt - SIP Outage, Material SIP Latency, or Extraordinary Market Activity	Denotes a regulatory halt when SIP is either unable to disseminate or having a delay in disseminating quote or trade information accurately for a material period, or a system disruption in SIP or one or more Trading Centers negatively impacts quoting and trading activity necessary to maintain a fair and orderly market.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

Term	Description
Resume	Indicates that trading for a Participant is no longer suspended in a security which had been Halted.
Round Lot	Number of shares that is equal to or an exact multiple of the symbol Round Lot Size. Round-lot size for a symbol can consist of 1, 10, 40 or 100 shares.
Rule 127 Trade (NYSE)	To qualify as a NYSE Rule 127 the trade is executed outside the present quote and meets one or both of the following conditions: <ol style="list-style-type: none"> <li>1. has a volume of 10,000 shares or more <i>and/or</i></li> <li>2. has a dollar value of \$200,000 or more.</li> </ol>
Rule 155 Trade (NYSE American)	To qualify as a NYSE American Rule 155, from time to time, a specialist may arrange for the sale, or purchase, of a block of security, or other large number of shares of securities, at a single “clean-up” price. Generally such a sale or purchase is outside of the current market. Such sale or trade is designated as a Rule 155 trade.
Self Help	The transaction that constituted the trade-through was effected when the market center displaying the protected quotation that was traded through was experiencing a failure, material delay or malfunction of its systems or equipment.
Seller	A Seller’s Option transaction gives the seller the right to deliver the security at any time within a specific period, ranging from not less than two calendar days, to not more than sixty calendar days. A security offered “Seller’s Option” may command a lesser price than if offered “Regular Way”.
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.
Single-Priced Opening	The transaction that constituted the trade-through was a single-priced opening transaction by the market center.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

Term	Description
Single-Priced Reopening	The transaction that constituted the trade-through was a single-priced reopening transaction by the market center.
Single-Priced Closing	The transaction that constituted the trade-through was a single-priced closing transaction by the market center.
Sold	Sold is used when a trade is printed (reported) out of sequence and at a time different from the actual transaction time.
Sold Last	Sold Last is used when a trade prints in sequence but is reported late or printed in conformance to the One or Two Point Rule.
Stock-Option Trade	Stock-Option Trade is used to identify cash equity transactions which are related to options transactions and therefore potentially subject to cancellation if market conditions of the options leg(s) prevent the execution of the stock-option order at the price agreed upon.
Stopped Stock	The transaction that constituted the trade-through was the execution by a trading center of an order for which, at the time of receipt of the order, the trading center had guaranteed an execution at no worse than a specified price (a “stopped order”), where: (i) The stopped order was for the account of a customer;(ii) The customer agreed to the specified price on an order-by-order basis; and (iii) The price of the trade-through transaction was for a stopped buy order lower than the National Best Bid in the security at the time of execution, or for a stopped sell order higher than the National Best Offer in the security at the time of execution.
Sub-Penny Trading	Indicates a non-regulatory Trading Halt for an NYSE security whose price may fall below \$1.05, possibly leading to a sub-penny execution.
Trading Day	The trading day comprises of 23 hours session from 9:00 PM ET to 8:00 PM the following day. Each trading day starts on Sunday, Monday, Tuesday, Wednesday and Thursday nights, when the following day is not a holiday.
Trading Halt	A temporary halt in the trading of a particular security by a Participant.
Trading Range Indication	Denotes the probable trading range (Bid and Offer prices, no sizes) of a security that is <u>not</u> Trading Halted. The Trading Range Indication is used prior to or after the opening of a security.

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX D: INPUT ERROR CONDITIONS**

CODE	DESCRIPTION	REJECTION REASON
1	Invalid Version	Unsupported Block Version number
2	Invalid Block Size	Block Size is less than minimum (1) or more than maximum (1000) allowable length
3	Invalid Block Sequence Number	Duplicate Message - the current Block Sequence Number is less than or equal to that of the last message processed. The expected message Block Sequence Number is not incremented and the message is not accepted
4	Invalid Messages in Block	Messages in Block is less than minimum (1) or more than maximum allowable length
5	Invalid Block Checksum	Block Checksum does not match
6	Invalid Message Length	Message Length is incorrect
7	Invalid Message Block	Block is incorrectly formatted and cannot be fully processed
8	Invalid Message ID	Message ID of the first Message in the Block is not 1, or Message ID is not incremented for subsequent messages in same block
9	Reserved	N/A
10	Reserved	N/A
11	Invalid text length	Text length is beyond acceptable bounds for the message
12	Message not acceptable before market open or after market close time	Message sent outside acceptable timeframe, message sent before SOD disseminated or after Participant EOD sent
13	Invalid Message Category and Type	Unsupported Message Category and Message Type
14	Invalid Participant ID	Participant ID is not a supported value
15	Invalid Timestamp 1	Timestamp is not within the appropriate range, invalid date and time
16	Invalid Participant Reference Number	Participant Reference Number is not within specified allowable ASCII character range
17	Duplicate Participant Reference Number	Participant Reference Number must be unique by Participant ID, by Trade Reporting Facility (TRF), by Security Symbol and by Participant Regional Reference Number
18	Listing Exchange is Impaired	Trade, Cancel or Correction message received while Exchange is Impaired
19	Invalid Auction Collar Price	Auction Collar Price is not a supported value
20	Invalid Number of Extensions	Number of Extensions is not a supported value
21	Invalid LULD Reference Price	LULD Reference Price zero, expecting non-zero
22	Message From Primary during Primary Market Halt	Primary Market Message is not acceptable during Primary Market Halt period
23	First IPO Trade is from Non-Primary Market	IPO trades are not accepted from Non-Primary Markets prior to Primary Market trade
24	Reserved	N/A
25	Reserved	N/A

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX D: INPUT ERROR CONDITIONS**

CODE	DESCRIPTION	REJECTION REASON
26	Invalid Bid Index Value	Bid Index Value is not a supported value
27	Invalid Buy Volume	Buy Volume is zero, expecting non-zero
28	Invalid Cancel or Error Action	Cancel or Error Action is not a supported value
29	Reserved	N/A
30	Reserved	N/A
31	Invalid Original Participant Reference Number	Original Participant Reference Number specified on Cancellation or Correction is not associated with any Trade or Correction Message
32	Original Trade already Cancelled	Original Trade already Cancelled
33	Original Trade already Corrected	Original Trade already Corrected
34	Reserved	N/A
35	Reserved	N/A
36	Invalid Crossing Session I Trade Volume	Crossing Session I Trade Volume is not a supported value
37	Invalid Crossing Session II Dollar Value	Crossing Session II Dollar Value is not a supported value
38	Invalid Crossing Session II Total Trade Volume	Crossing Session II Total Trade Volume not a supported value
39	Invalid Dollar Value	Dollar Value is not a supported value
40	Invalid Halt Reason	Halt Reason is not a supported value, or, Halt Reason specified while Security Status is not in Halt
41	Reserved	N/A
42	Reserved	N/A
43	Reserved	N/A
44	Invalid Participant for Trading Status Message	Trading Status Message from Participant that is not the Listing Exchange for the security symbol
45	Invalid Price Indication/Trading Range Indication	Price Indication received while security symbol is not Trading Halted, or, Trading Range Indication received while symbol is Trading Halted
46	Invalid High Indication Price	High Price not greater than Low Price on Price Indication
47	Invalid Trading Status ID	Trading status ID does not contain a non-Zero Integer value
48	Invalid High Indication Price	Invalid combination of Trading Pause and High Indication Price
49	Reserved	N/A
50	Reserved	N/A

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX D: INPUT ERROR CONDITIONS**

CODE	DESCRIPTION	REJECTION REASON
51	Invalid Index Symbol	Index Symbol contains unsupported character
52	Invalid Index Value	Index Value is not a supported value
53	Invalid Instrument Type	Instrument Type value is not a supported value
54	Invalid Last Price	Last Price is not a supported value
55	Invalid Opening (Reopening) LULD Reference Price	Opening (Reopening) LULD Reference Price received when not expecting to receive (e.g., eligible trade already received setting reference price).
56	Invalid Low Indication Price	Invalid combination of Trading Pause and Low Indication Price
57	Reserved	N/A
58	Reserved	N/A
59	Invalid Upper/Lower Limit Price Band	Only one of the Price bands can be non-zero on a LULD Trading Halt
60	Reserved	N/A
61	Reserved	N/A
62	Invalid Offer Index Value	Offer Index Value is not a supported value
63	Reserved	N/A
64	Invalid Prior Day Trade Date and Time	Prior Day Trade Date is current date or future date
65	Invalid Sale Condition	Sale Condition is not a supported value
66	Invalid Trade Volume for Sale Condition	Trade Volume should contain value less than a round lot when Sale Condition is I
67	Invalid Time For Sale Condition 9	Sale Condition 9 Trade received before allowable reporting time of 30 seconds after market close
68	Invalid Participant Input for Sale Condition 9	Sale Condition 9 Trade received from non-listing market
69	Invalid Volume for Sale Condition 9	Sale Condition 9 Trade received from listing market with volume other than '0'
70	Reserved	N/A
71	Invalid Security Status	Security Status is not a supported value
72	Invalid Sale Condition in Category Position	Sale Condition values are not populated in accordance with Sale Condition Category position
73	Invalid Security Symbol	Unknown Security Symbol, either the security symbol and suffix are incorrect or no master record exists for the security symbol
74	Invalid Sell Volume	Sell Volume is zero, expecting non-zero
75	Invalid Number of Seller's Sale Days	Seller's Sale Days must be within 2 – 60 days for Sale Condition R

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX D: INPUT ERROR CONDITIONS**

CODE	DESCRIPTION	REJECTION REASON
76	Invalid Short Sale Restriction Indicator	Short Sale Restriction Indicator is not a supported value
77	Invalid Stop Stock Indicator	Stop Stock Indicator is not a supported value
78	Invalid Timestamp 2	Timestamp is not within the appropriate range, invalid date and time
79	Invalid Total Trades	Total Trades is not a supported value
80	Invalid Trade Price	Price is zero, expecting non-zero
81	Invalid Trade Reporting Facility ID	Trade Reporting Facility ID is not a supported value
82	Invalid Trade Through Exempt Indicator	Trade Through Exempt Indicator is not a supported value
83	Reserved	N/A
84	Invalid Trade Volume	Trade Volume is zero, expecting non-zero
85	Unprintable ASCII Character	ASCII character not within 32-126 range
86	Reserved	N/A
104	Invalid Auction Collar Upper Threshold Price	Auction Collar Upper Threshold Price is not a supported value
105	Invalid Auction Collar Lower Threshold Price	Auction Collar Lower Threshold Price is not a supported value
110	Invalid Sale Condition Category	Sale Condition Category is not a supported value
111	Invalid LULD Eligibility	LULD Trading Halt or LULD Reference Price received for stock that is not LULD eligible
199	Unspecified Error	Unspecified Error

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CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX E: SUMMARY OF DAILY CTS EVENT SCHEDULE**

To incorporate Extended Trading Hours, CTA supports trading beginning at 9:00 PM ET Sunday through 8:00 PM ET Friday with a daily pause of up to 1 hour. Each CTA session starts at ~9:00 PM ET Sunday through Thursday nights and ends at ~8:00 PM ET the following day. For US holidays, there will be no CTA session beginning the evening before the holiday, nor during Regular Trading Hours on the day of the holiday. The Session for the following business day will begin on the evening of the holiday, provided the next day is a business day.

Each CTA session (9:00 PM - 8:00 PM) is considered to be one **trading day**. Trades and Quotes reported during 9:00 PM to 12:00 AM are included under the **next calendar day** for any statistical calculations.

All times in the table below are approximate and expressed in *Eastern Time (ET)*.

Time (ET)	Transmission / Events
20:50:00	Input Ports opened to allow Participant Connectivity*
20:55:00	Start of Day – Control Message
20:55 - 21:00	CTA generates: <ul style="list-style-type: none"> <li>• Symbol Reference Data</li> <li>• Security Status Messages (Trading Halt, Short Sale Restriction)**</li> <li>• LULD Price Band Messages (<i>Overnight Price Bands</i>)</li> </ul>
20:55 – 20:01 (Next day)	All Application Messages allowed
09:30 – 16:00***	CTA generates: <ul style="list-style-type: none"> <li>• LULD Price Band Messages (<i>Regular Trading Hours Price Bands</i>)</li> <li>• Market-Wide Circuit Breaker Status – Market Status Message</li> </ul>
20:01:00***	End of Day - Control Message

\* Only Line Integrity and Sequence Information (Control Messages) are allowed until Start of Day Message is generated, following which all Application Messages are allowed.

\*\* After Start of Day, CTS publishes Security Status updates of Trading Halt and Short Sale Restriction (SSR) on behalf of Listing Exchanges for any symbols that are in a halt state or have an SSR update. Listing Exchanges may reissue these Trading Status updates when they connect to SIP.

\*\*\* For days when market operates on an abbreviated schedule (the day after Thanksgiving Day and the day before Christmas Day), Regular Trading Hours end at 1:00 PM ET and End of Day occur at 17:01 PM ET

CONSOLIDATED TAPE SYSTEM (CTS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX F: 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