

# NASDAQ TotalView-ITCH 5.0

*ITCH is the revolutionary NASDAQ OMX outbound protocol*

## 1 Overview

NASDAQ TotalView-ITCH<sup>SM</sup> is a direct data feed product offered by The NASDAQ Stock Market, LLC. This specification covers both the software, and hardware (FPGA) versions of the feed.

NASDAQ TotalView-ITCH 5.0 features the following data elements (in binary number format) for all exchange-listed equities securities traded via the NASDAQ execution system:

- **Order level data with attribution:** For NASDAQ execution system, NASDAQ will provide its full order depth using the standard ITCH format. TotalView-ITCH uses a series of messages of order messages to track the life of a customer order.<sup>1</sup> As an added feature, the TotalView-ITCH message formats will support NASDAQ market participant attribution. TotalView-ITCH carries order level data for NYSE-, NYSE MKT-, NYSE Arca- and BATS-listed securities as well as for NASDAQ-listed securities.
- **Trade messages:** To ensure that customers have complete information about NASDAQ order flow, TotalView-ITCH 5.0 supports a trade message to reflect a match of a non-displayable order in the NASDAQ system. TotalView-ITCH 5.0 also supports a separate trade message to reflect NASDAQ cross transactions.
- **Net Order Imbalance Data:** In the minutes leading up to the NASDAQ Opening and Closing Crosses as well as the NASDAQ Crosses for IPO or halted/paused securities, NASDAQ disseminates the indicative clearing price and net order imbalance on NASDAQ. Because the calculation includes non-displayable as well as displayable order types, the Net Order Imbalance Indicator (NOII) is the best predictor of the NASDAQ opening and closing prices available to the public.
- **Administrative messages**, such trading actions and symbol directory messages:
  - Trading action messages are used to inform market participants when a security is halted/paused or released for trading.
  - Symbol Directory messages provide basic security data such as the market tier and Financial Status Indicator.
  - Market participant position message carries the Primary Market Maker status, Market Participant status and Market Maker mode fields used by some firms to comply with market regulations.
- **Event controls**, such as start of day, end of day and emergency market halt/resume.

## 2 Architecture

The TotalView-ITCH 5.0 feed is made up of a series of sequenced messages. Each message is variable in length based on the message type. The messages that make up the TotalView-ITCH 5.0

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<sup>1</sup> TOTALVIEW-ITCH is an outbound market data feed only. The ITCH protocol does not support order entry. For information on NASDAQ order entry protocols, please refer to the [Trading Products section](#) of the NASDAQ OMX Trader<sup>®</sup> website.

protocol are typically delivered using a higher level protocol that takes care of sequencing and delivery guarantees.

NASDAQ offers the TotalView-ITCH 5.0 data feed in three protocol options:.

- o [SoupBinTCP](#)
- o [Compressed](#) via SoupBinTCP
- o [MoldUDP64](#)

In the market data messages, instruments are identified by a stock locate code – a low lying integer employed with the intent of serving as an array index for rapidly looking up instrument details. The locate codes are dynamically assigned each day, starting with a value of 1, and communicated via the Stock Directory message. An instrument's locate code will not change intraday; however, there should be no expectation that the assignment will be the same across multiple days. The Stock Locate code appears all messages, and at the same position in all messages to support efficient filtering. A default value of 0 will be applied to messages which are not stock dependent.

#### **FPGA version:**

NASDAQ will broadcast the TotalView-ITCH FPGA feed from the U.S. primary data center facility in Carteret, New Jersey in the [MoldUDP64](#) protocol option only. Given the unshaped network traffic, NASDAQ OMX is requiring firms to have 10 Gb or 40 Gb network connection into the Carteret, NJ data center to obtain the TotalView-ITCH FPGA feed.

As with the software version of the feed, the TotalView-ITCH FPGA feed will be comprised of a series of sequenced order messages. Outside of the fact that the FPGA data delivery is unthrottled or unshaped at the network level, the TotalView-ITCH payload will be the same for both versions of the TotalView-ITCH 5.0 data formats. TotalView-ITCH FPGA product is guaranteed to disseminate payload messages in the same exact order as the software-based version of the TotalView-ITCH feed.

With this messaging sequencing guarantee, TotalView-ITCH FPGA firms will be able to utilize the GLIMPSE 5.0 service to obtain current state of the book retransmissions. Firms may also use the software version of TotalView-ITCH 5.0 for fault tolerance or disaster recovery purposes.

## **3 Data Types**

All integer fields are big-endian (network byte order) binary encoded numbers. Unless otherwise noted, they are unsigned.

All alpha fields are ASCII fields which are left justified and padded on the right with spaces.

Prices are integer fields, supplied with an associated precision.. When converted to a decimal format, prices are in fixed point format, where the precision defines the number of decimal places. For example, a field flagged as Price (4) has an implied 4 decimal places. The maximum value of price (4) in TotalView-ITCH is 200,000.0000 (decimal, 77359400 hex).

Timestamps are represented as nanoseconds since midnight

## **4 Message Formats**

The TotalView-ITCH feed is composed of a series of messages that describe orders added to, removed from, and executed on NASDAQ as well as disseminate Cross and Stock Directory information.

## 4.1 System Event Message

The system event message type is used to signal a market or data feed handler event. The format is as follows:

SYSTEM EVENT MESSAGE				
Name	Offset	Length	Value	Notes
Message Type	0	1	"S"	System Event Message.
Stock Locate	1	2	Integer	Always 0
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Event Code	11	1	Alpha	See System Event Codes below.

NASDAQ supports the following event codes on a daily basis on the TotalView-ITCH 5.0 data feed.

SYSTEM EVENT CODES – DAILY	
Code	Explanation
"O"	<i>Start of Messages.</i> Outside of time stamp messages, the start of day message is the first message sent in any trading day.
"S"	<i>Start of System hours.</i> This message indicates that NASDAQ is open and ready to start accepting orders.
"Q"	<i>Start of Market hours.</i> This message is intended to indicate that Market Hours orders are available for execution.
"M"	<i>End of Market hours.</i> This message is intended to indicate that Market Hours orders are no longer available for execution.
"E"	<i>End of System hours.</i> It indicates that NASDAQ is now closed and will not accept any new orders today. It is still possible to receive Broken Trade messages and Order Delete messages after the End of Day.
"C"	<i>End of Messages.</i> This is always the last message sent in any trading day.

## 4.2 Stock Related Messages

### 4.2.1 Stock Directory

At the start of each trading day, NASDAQ disseminates stock directory messages for all active symbols in the NASDAQ execution system.

Market data redistributors should process this message to populate the Financial Status Indicator (required display field) and the Market Category (recommended display field) for NASDAQ-listed issues.

STOCK DIRECTORY				
Name	Offset	Length	Value	Notes
Message Type	0	1	"R"	Stock Directory Message
Stock Locate	1	2	Integer	Locate Code uniquely assigned to the security symbol for the day.
Tracking	3	2	Integer	NASDAQ OMX internal tracking number

TOTALVIEW-ITCH 5.0 INTERFACE SPECIFICATION

Number																																
Timestamp	5	6	Integer	Time at which the directory message was generated. Refer to Data Types for field processing notes.																												
Stock	11	8	Alpha	Denotes the security symbol for the issue in the NASDAQ execution system.																												
Market Category	19	1	Alpha	Indicates Listing market or listing market tier for the issue <table border="1" data-bbox="857 499 1339 907"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td colspan="2"><i>NASDAQ-Listed Instruments</i></td> </tr> <tr> <td>Q</td> <td>NASDAQ Global Select Market<sup>SM</sup></td> </tr> <tr> <td>G</td> <td>NASDAQ Global Market<sup>SM</sup></td> </tr> <tr> <td>S</td> <td>NASDAQ Capital Market<sup>®</sup></td> </tr> <tr> <td colspan="2"><i>Non-NASDAQ-Listed Instruments</i></td> </tr> <tr> <td>N</td> <td>New York Stock Exchange (NYSE)</td> </tr> <tr> <td>A</td> <td>NYSE MKT</td> </tr> <tr> <td>P</td> <td>NYSE Arca</td> </tr> <tr> <td>Z</td> <td>BATS Z Exchange</td> </tr> <tr> <td>&lt;space&gt;</td> <td>Not available</td> </tr> </tbody> </table>	Code	Definition	<i>NASDAQ-Listed Instruments</i>		Q	NASDAQ Global Select Market <sup>SM</sup>	G	NASDAQ Global Market <sup>SM</sup>	S	NASDAQ Capital Market <sup>®</sup>	<i>Non-NASDAQ-Listed Instruments</i>		N	New York Stock Exchange (NYSE)	A	NYSE MKT	P	NYSE Arca	Z	BATS Z Exchange	<space>	Not available						
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Financial Status Indicator	20	1	Alpha	For NASDAQ-listed issues, this field indicates when a firm is not in compliance with NASDAQ continued listing requirements. <table border="1" data-bbox="857 1075 1339 1753"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td colspan="2"><i>NASDAQ-Listed Instruments</i></td> </tr> <tr> <td>D</td> <td>Deficient</td> </tr> <tr> <td>E</td> <td>Delinquent</td> </tr> <tr> <td>Q</td> <td>Bankrupt</td> </tr> <tr> <td>S</td> <td>Suspended</td> </tr> <tr> <td>G</td> <td>Deficient and Bankrupt</td> </tr> <tr> <td>H</td> <td>Deficient and Delinquent</td> </tr> <tr> <td>J</td> <td>Delinquent and Bankrupt</td> </tr> <tr> <td>K</td> <td>Deficient, Delinquent and Bankrupt</td> </tr> <tr> <td>C</td> <td>Creations and/or Redemptions Suspended for Exchange Traded Product</td> </tr> <tr> <td>N</td> <td>Normal (Default): Issuer Is NOT Deficient, Delinquent, or Bankrupt</td> </tr> <tr> <td colspan="2"><i>Non-NASDAQ-Listed Instruments</i></td> </tr> <tr> <td>&lt;space&gt;</td> <td>Not available. Firms should refer to SIAC feeds for code if needed.</td> </tr> </tbody> </table>	Code	Definition	<i>NASDAQ-Listed Instruments</i>		D	Deficient	E	Delinquent	Q	Bankrupt	S	Suspended	G	Deficient and Bankrupt	H	Deficient and Delinquent	J	Delinquent and Bankrupt	K	Deficient, Delinquent and Bankrupt	C	Creations and/or Redemptions Suspended for Exchange Traded Product	N	Normal (Default): Issuer Is NOT Deficient, Delinquent, or Bankrupt	<i>Non-NASDAQ-Listed Instruments</i>		<space>	Not available. Firms should refer to SIAC feeds for code if needed.
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Round Lot Size	21	4	Integer	Denotes the number of shares that represent a round lot for the issue																												
Round Lots Only	25	1	Alpha	Indicates if NASDAQ system limits order entry for issue																												

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Issue Classification	26	1	Alpha	Identifies the security class for the issue as assigned by NASDAQ. See Appendix for allowable values.												
Issue Sub-Type	27	2	Alpha	Identifies the security sub-type for the issue as assigned by NASDAQ. See Appendix for allowable values.												
Authenticity	29	1	Alpha	Denotes if an issue or quoting participant record is set-up in NASDAQ systems in a live/production, test, or demo state. Please note that firms should only show live issues and quoting participants on public quotation displays. <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>Live/Production</td> </tr> <tr> <td>T</td> <td>Test</td> </tr> </tbody> </table>	Code	Definition	P	Live/Production	T	Test						
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P	Live/Production															
T	Test															
Short Sale Threshold Indicator	30	1	Alpha	Indicates if a security is subject to mandatory close-out of short sales under SEC Rule 203(b)(3). <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Issue is restricted under SEC Rule 203(b)(3)</td> </tr> <tr> <td>N</td> <td>Issue is not restricted</td> </tr> <tr> <td>&lt;space&gt;</td> <td>Threshold Indicator not available</td> </tr> </tbody> </table>	Code	Definition	Y	Issue is restricted under SEC Rule 203(b)(3)	N	Issue is not restricted	<space>	Threshold Indicator not available				
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IPO Flag	31	1	Alpha	Indicates if the NASDAQ security is set up for IPO release. This field is intended to help NASDAQ market participant firms comply with FINRA Rule 5131(b). <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td colspan="2"><i>NASDAQ-Listed Instruments</i></td> </tr> <tr> <td>Y</td> <td>NASDAQ listed instrument is set up as a new IPO security</td> </tr> <tr> <td>N</td> <td>NASDAQ listed instrument is not set up as a new IPO security</td> </tr> <tr> <td colspan="2"><i>Non-NASDAQ-Listed Instruments</i></td> </tr> <tr> <td>&lt;space&gt;</td> <td>Not available</td> </tr> </tbody> </table>	Code	Definition	<i>NASDAQ-Listed Instruments</i>		Y	NASDAQ listed instrument is set up as a new IPO security	N	NASDAQ listed instrument is not set up as a new IPO security	<i>Non-NASDAQ-Listed Instruments</i>		<space>	Not available
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<i>Non-NASDAQ-Listed Instruments</i>																
<space>	Not available															
LULD Reference Price Tier	32	1	Alpha	Indicates which Limit Up / Limit Down price band calculation parameter is to be used for the instrument. Refer to <a href="#">LULD Rule</a> for												

				<p>details.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Tier 1 NMS Stocks and select ETPs</td> </tr> <tr> <td>2</td> <td>Tier 2 NMS Stocks</td> </tr> <tr> <td>&lt;space&gt;</td> <td>Not applicable</td> </tr> </tbody> </table>	Code	Definition	1	Tier 1 NMS Stocks and select ETPs	2	Tier 2 NMS Stocks	<space>	Not applicable
Code	Definition											
1	Tier 1 NMS Stocks and select ETPs											
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ETP Flag	33	1	Alpha	<p>Indicates whether the security is an exchange traded product (ETP):</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Instrument is an ETP</td> </tr> <tr> <td>N</td> <td>Instrument is not an ETP</td> </tr> <tr> <td>&lt;space&gt;</td> <td>Not available</td> </tr> </tbody> </table>	Code	Definition	Y	Instrument is an ETP	N	Instrument is not an ETP	<space>	Not available
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Y	Instrument is an ETP											
N	Instrument is not an ETP											
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ETP Leverage Factor	34	4	Integer	<p>Tracks the integral relationship of the ETP to the underlying index. Example: If the underlying Index increases by a value of 1 and the ETP's Leverage factor is 3, indicates the ETF will increase/decrease (see Inverse) by 3.</p> <p>Note: Leverage Factor of 1 indicates the ETP is NOT leveraged.</p> <p>This field is used for LULD Tier I price band calculation purposes.</p>								
Inverse Indicator	38	1	Alpha	<p>Indicates the directional relationship between the ETP and underlying index.</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>ETP is an Inverse ETP</td> </tr> <tr> <td>N</td> <td>ETP is not an Inverse ETP</td> </tr> </tbody> </table> <p>Example: An ETP Leverage Factor of 3 and an Inverse value of 'Y' indicates the ETP will decrease by a value of 3.</p>	Code	Definition	Y	ETP is an Inverse ETP	N	ETP is not an Inverse ETP		
Code	Definition											
Y	ETP is an Inverse ETP											
N	ETP is not an Inverse ETP											

## 4.2.2 Stock Trading Action

NASDAQ uses this administrative message to indicate the current trading status of a security to the trading community.

Prior to the start of system hours, NASDAQ will send out a Trading Action spin. In the spin, NASDAQ will send out a Stock Trading Action message with the "T" (Trading Resumption) for all NASDAQ- and other exchange-listed securities that are eligible for trading at the start of the system hours. If a security is absent from the pre-opening Trading Action spin, firms should assume that the security is being treated as halted in the NASDAQ platform at the start of the system hours. Please note that securities may be halted in the NASDAQ system for regulatory or operational reasons.

After the start of system hours, NASDAQ will use the Trading Action message to relay changes in trading status for an individual security. Messages will be sent when a stock is:

- Halted
- Paused\*
- Released for quotation
- Released for trading

\* The paused status will be disseminated for NASDAQ-listed securities only. Trading pauses on non-NASDAQ listed securities will be treated simply as a halt.

STOCK TRADING ACTION				
Name	Offset	Length	Value	Notes
Message Type	0	1	"H"	Stock Trading Action Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Stock	11	8	Alpha	Stock symbol, right padded with spaces
Trading State	19	1	Alpha	Indicates the current trading state for the stock. Allowable values:  "H" = Halted across all U.S. equity markets / SROs "P" = Paused across all U.S. equity markets / SROs (NASDAQ-listed securities only) "Q" = Quotation only period for cross-SRO halt or pause "T" = Trading on NASDAQ
Reserved	20	1	Alpha	Reserved.
Reason	21	4	Alpha	Trading Action reason.

## 4.2.3 Reg SHO Short Sale Price Test Restricted Indicator

In February 2011, the Securities and Exchange Commission (SEC) implemented changes to Rule 201 of the Regulation SHO (Reg SHO). For details, please refer to [SEC Release Number 34-61595](#). In association with the Reg SHO rule change, NASDAQ will introduce the following Reg SHO Short Sale Price Test Restricted Indicator message format.

For NASDAQ-listed issues, NASDAQ supports a full pre-opening spin of Reg SHO Short Sale Price Test Restricted Indicator messages indicating the Rule 201 status for all active issues. NASDAQ also

sends the Reg SHO Short Sale Price Test Restricted Indicator message in the event of an intraday status change.

For other exchange-listed issues, NASDAQ relays the Reg SHO Short Sale Price Test Restricted Indicator message when it receives an update from the primary listing exchange.

NASDAQ processes orders based on the most Reg SHO Restriction status value.

REG SHO RESTRICTION				
Name	Offset	Length	Value	Notes
Message Type	0	1	"Y"	Reg SHO Short Sale Price Test Restricted Indicator
Locate Code	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
Stock	11	8	Alpha	Stock symbol, right padded with spaces
Reg SHO Action	19	1	Alpha	Denotes the Reg SHO Short Sale Price Test Restriction status for the issue at the time of the message dissemination. Allowable values are:  "0" = No price test in place  "1" = Reg SHO Short Sale Price Test Restriction in effect due to an intra-day price drop in security  "2" = Reg SHO Short Sale Price Test Restriction remains in effect

#### 4.2.4 Market Participant Position

At the start of each trading day, NASDAQ disseminates a spin of market participant position messages. The message provides the Primary Market Maker status, Market Maker mode and Market Participant state for each NASDAQ market participant firm registered in an issue. Market participant firms may use these fields to comply with certain marketplace rules.

Throughout the day, NASDAQ will send out this message only if NASDAQ Operations changes the status of a market participant firm in an issue.

MARKET PARTICIPANT POSITION				
Name	Offset	Length	Value	Notes
Message Type	0	1	"L"	Market Participant Position message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight
MPID	11	4	Alpha	Denotes the market participant identifier for which the position message is being generated
Stock	15	8	Alpha	Stock symbol, right padded with spaces
Primary Market Maker	23	1	Alpha	Indicates if the market participant firm qualifies as a Primary Market Maker in accordance with NASDAQ marketplace rules  "Y" = primary market maker "N" = non-primary market maker



Market Maker Mode	24	1	Alpha	Indicates the quoting participant's registration status in relation to SEC Rules 101 and 104 of Regulation M  "N" = normal "P" = passive "S" = syndicate "R" = pre-syndicate "L" = penalty
Market Participant State	25	1	Alpha	Indicates the market participant's current registration status in the issue  "A" = Active "E" = Excused/Withdrawn "W" = Withdrawn "S" = Suspended "D" = Deleted

## 4.2.5 Market-Wide Circuit Breaker (MWCB) Messaging

### 4.2.5.1 MWCB Decline Level Message

Informs data recipients what the daily MWCB breach points are set to for the current trading day.

MWCB Decline Level Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"V"	Market wide circuit breaker Decline Level Message.
Stock Locate	1	2	Integer	Always set to 0
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Time at which the MWCB Decline Level message was generated
Level 1	11	8	Price (8)	Denotes the MWCB Level 1 Value.
Level 2	19	8	Price (8)	Denotes the MWCB Level 2 Value.
Level 3	27	8	Price (8)	Denotes the MWCB Level 3 Value.

### 4.2.5.2 MWCB Status Message

Informs data recipients when a MWCB has breached one of the established levels

MWCB Breach Message				
Name	Offset	Length	Value	Notes
Message Type	0	1	"W"	Market-Wide Circuit Breaker Status message
Stock Locate	1	2	Integer	Always set to 0
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Time at which the MWCB Breaker Status message was generated
Breached Level	11	1	Alpha	Denotes the MWCB Level that was breached.  "1" = Level 1

				"2" = Level 2 "3" = Level 3
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#### 4.2.6 IPO Quoting Period Update

Indicates the anticipated IPO quotation release time of a security.

IPO Quoting Period Update										
Name	Offset	Length	Value	Notes						
Message Type	0	1	"K"	IPO Quoting Period Update Message						
Stock Locate	1	2	Integer	Always set to 0						
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number						
Timestamp	5	6	Integer	Time at which the IPQ Quoting Period Update message was generated						
Stock	11	8	Alpha	Denotes the security symbol for the issue in the NASDAQ execution system.						
IPO Quotation Release Time	19	4	Integer	Denotes the IPO release time, in seconds since midnight, for quotation to the nearest second.  NOTE: If the quotation period is being canceled/postponed, we should state that <ol style="list-style-type: none"> <li>1. IPO Quotation Time will be set to 0</li> <li>2. IPO Price will be set to 0</li> </ol>						
IPO Quotation Release Qualifier	23	1	Alpha	<table border="1"> <thead> <tr> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>A</td> <td> <b>Anticipated quotation release time</b>  <i>This value would be used when NASDAQ Market Operations initially enters the IPO instrument for release.</i> </td> </tr> <tr> <td>C</td> <td> <b>IPO release canceled/postponed</b>  <i>This value would be used when NASDAQ Market Operations cancels or postpones the release of the IPO instrument.</i> </td> </tr> </tbody> </table>	Code	Description	A	<b>Anticipated quotation release time</b> <i>This value would be used when NASDAQ Market Operations initially enters the IPO instrument for release.</i>	C	<b>IPO release canceled/postponed</b> <i>This value would be used when NASDAQ Market Operations cancels or postpones the release of the IPO instrument.</i>
				Code	Description					
A	<b>Anticipated quotation release time</b> <i>This value would be used when NASDAQ Market Operations initially enters the IPO instrument for release.</i>									
C	<b>IPO release canceled/postponed</b> <i>This value would be used when NASDAQ Market Operations cancels or postpones the release of the IPO instrument.</i>									
Denotes the IPO price to be used for intraday net change calculations.  Prices are given in decimal format with 6 whole number places followed by 4 decimal digits. The whole number portion is padded on the left with spaces; the decimal portion is padded on the right with zeros. The decimal point is implied by position; it does not appear inside the price field.										
IPO Price	24	4	Price (4)							

### 4.3 Add Order Message

An Add Order Message indicates that a new order has been accepted by the NASDAQ system and was added to the displayable book. The message includes a day-unique Order Reference Number used by NASDAQ to track the order.

NASDAQ will support two variations of the Add Order message format.

#### 4.3.1 Add Order – No MPID Attribution

This message will be generated for unattributed orders accepted by the NASDAQ system. (Note: If a firm wants to display a MPID for unattributed orders, NASDAQ recommends that it use the MPID of “NSDQ”.)

ADD ORDER MESSAGE				
Name	Offset	Length	Value	Notes
Message Type	0	1	“A”	Add Order – No MPID Attribution Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The unique reference number assigned to the new order at the time of receipt.
Buy/Sell Indicator	19	1	Alpha	The type of order being added.  “B” = buy order. “S” = sell order.
Shares	20	4	Integer	The total number of shares associated with the order being added to the book.
Stock	24	8	Alpha	Stock symbol, right padded with spaces
Price	32	4	Price (4)	The display price of the new order. Refer to Data Types for field processing notes.

#### 4.3.2 Add Order with MPID Attribution

This message will be generated for attributed orders and quotations accepted by the NASDAQ system.

ADD ORDER – MPID ATTRIBUTION MESSAGE				
Name	Offset	Length	Value	Notes
Message Type	0	1	“F”	Add Order with MPID Attribution Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The unique reference number assigned to the new order at the time of receipt.
Buy/Sell Indicator	19	1	Alpha	The type of order being added.  “B” = buy order. “S” = sell order.
Shares	20	4	Integer	The total number of shares associated

				with the order being added to the book.
Stock	24	8	Alpha	Stock symbol, right padded with spaces
Price	32	4	Price (4)	The display price of the new order. Refer to Data Types for field processing notes.
Attribution	36	4	Alpha	NASDAQ market participant identifier associated with the entered order.

## 4.4 Modify Order Messages

Modify Order messages always include the Order Reference Number of the Add Order to which the update applies. To determine the current display shares for an order, ITCH 5.0 subscribers must deduct the number of shares stated in the Modify message from the original number of shares stated in the Add Order message with the same reference number. NASDAQ may send multiple Modify Order messages for the same order reference number and the effects are cumulative. When the number of display shares for an order reaches zero, the order is dead and should be removed from the book.

### 4.4.1 Order Executed Message

This message is sent whenever an order on the book is executed in whole or in part. It is possible to receive several Order Executed Messages for the same order reference number if that order is executed in several parts. The multiple Order Executed Messages on the same order are cumulative.

By combining the executions from both types of Order Executed Messages and the Trade Message, it is possible to build a complete view of all non-cross executions that happen on NASDAQ. Cross execution information is available in one bulk print per symbol via the Cross Trade Message.

ORDER EXECUTED MESSAGE				
Name	Offset	Length	Value	Notes
Message Type	0	1	"E"	Order Executed Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The order reference number associated with the executed order.
Executed Shares	19	4	Integer	The number of shares executed.
Match Number	23	8	Integer	The NASDAQ generated day-unique Match Number of this execution. The match number is also referenced in the Trade Break Message.

### 4.4.2 Order Executed With Price Message

This message is sent whenever an order on the book is executed in whole or in part at a price different from the initial display price. Since the execution price is different than the display price of the original Add Order, NASDAQ includes a price field within this execution message.

It is possible to receive multiple Order Executed and Order Executed With Price messages for the same order if that order is executed in several parts. The multiple Order Executed messages on the same order are cumulative.

These executions may be marked as non-printable. If the execution is marked as non-printed, it means that the shares will be included into a later bulk print (e.g., in the case of cross executions). If a firm is looking to use the data in time-and-sales displays or volume calculations, NASDAQ recommends that firms ignore messages marked as non-printable to prevent double counting.

<b>ORDER EXECUTED WITH PRICE MESSAGE</b>				
<b>Name</b>	<b>Offset</b>	<b>Length</b>	<b>Value</b>	<b>Notes</b>
Message Type	0	1	"C"	Order Executed Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The reference number of the order that was executed.
Executed Shares	19	4	Integer	The number of shares executed.
Match Number	23	8	Integer	The NASDAQ generated day-unique Match Number of this execution. The match number is also referenced in the Trade Break Message.
Printable	31	1	Alpha	Indicates if the execution should be reflected on time and sale displays and volume calculations. "N" = non-printable "Y" = printable
Execution Price	32	4	Price (4)	The price at which the order execution occurred. Refer to Data Types for field processing notes.

#### 4.4.3 Order Cancel Message

This message is sent whenever an order on the book is modified as a result of a partial cancellation.

<b>ORDER CANCEL MESSAGE</b>				
<b>Name</b>	<b>Offset</b>	<b>Length</b>	<b>Value</b>	<b>Notes</b>
Message Type	0	1	"X"	Order Cancel Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The reference number of the order being reduced.
Canceled Shares	19	4	Integer	The number of shares being removed from the display size of the order as the result of a cancellation.

#### 4.4.4 Order Delete Message

This message is sent whenever an order on the book is being cancelled. All remaining shares are no longer accessible so the order must be removed from the book.

<b>ORDER DELETE MESSAGE</b>				
<b>Name</b>	<b>Offset</b>	<b>Length</b>	<b>Value</b>	<b>Notes</b>
Message Type	0	1	"D"	Order Delete Message.

Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The reference number of the order being canceled.

#### 4.4.5 Order Replace Message

This message is sent whenever an order on the book has been cancel-replaced. All remaining shares from the original order are no longer accessible, and must be removed. The new order details are provided for the replacement, along with a new order reference number which will be used henceforth. Since the side, stock symbol and attribution (if any) cannot be changed by an Order Replace event, these fields are not included in the message. Firms should retain the side, stock symbol and MPID from the original Add Order message.

ORDER REPLACE MESSAGE				
Name	Offset	Length	Value	Notes
Message Type	0	1	"U"	Order Replace Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Original Order Reference Number	11	8	Integer	The original reference number of the order being replaced.
New Order Reference Number	19	8	Integer	The new reference number for this order at time of replacement.  Please note that the NASDAQ system will use this new order reference number for all subsequent updates.
Shares	27	4	Integer	The new total displayed quantity.
Price	31	4	Price (4)	The new display price for the order. Refer to Data Types for field processing notes.

### 4.5 Trade Messages

#### 4.5.1 Trade Message (Non-Cross)

The Trade Message is designed to provide execution details for normal match events involving non-displayable order types. (Note: There is a separate message for NASDAQ cross events.)

Since no Add Order Message is generated when a non-displayed order is initially received, NASDAQ cannot use the Order Executed messages for all matches. Therefore this message indicates when a match occurs between non-displayable order types. A Trade Message is transmitted each time a non-displayable order is executed in whole or in part. It is possible to receive multiple Trade Messages for the same order if that order is executed in several parts. Trade Messages for the same order are cumulative.

Trade Messages should be included in NASDAQ time-and-sales displays as well as volume and other market statistics. Since Trade Messages do not affect the book, however, they may be ignored by firms just looking to build and track the NASDAQ execution system display.

TRADE MESSAGE (NON-CROSS)				
Name	Offset	Length	Value	Notes
Message Type	0	1	"P"	Trade Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Order Reference Number	11	8	Integer	The unique reference number assigned to the order on the book being executed.  Effective December 6, 2010, NASDAQ OMX will populate the Order Reference Number field within the Trade (Non-Cross) message as zero. For the binary versions of the TotalView-ITCH data feeds, the field will be null-filled bytes (which encodes sequence of zero).
Buy/Sell Indicator	19	1	Alpha	The type of non-display order on the book being matched. "B" =buy order "S" =sell order  <b>Effective 07/14/2014, this field will always be "B" regardless of the resting side.</b>
Shares	20	4	Integer	The number of shares being matched in this execution.
Stock	24	8	Alpha	Stock symbol, right padded with spaces
Price	32	4	Price (4)	The match price of the order. Refer to Data Types for field processing notes.
Match Number	36	8	Integer	The NASDAQ generated session-unique Match Number for this trade. The Match Number is referenced in the Trade Break Message.

#### 4.5.2 Cross Trade Message

Cross Trade message indicates that NASDAQ has completed its cross process for a specific security. NASDAQ sends out a Cross Trade message for all active issues in the system following the Opening, Closing and EMC cross events. Firms may use the Cross Trade message to determine when the cross for each security has been completed. (Note: For the halted / paused securities, firms should use the Trading Action message to determine when an issue has been released for trading.)

For most issues, the Cross Trade message will indicate the bulk volume associated with the cross event. If the order interest is insufficient to conduct a cross in a particular issue, however, the Cross Trade message may show the shares as zero.

To avoid double counting of cross volume, firms should not include transactions marked as non-printable in time-and-sales displays or market statistic calculations.

CROSS TRADE MESSAGE				
Name	Offset	Length	Value	Notes
Message Type	0	1	"Q"	Cross Trade Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Shares	11	8	Integer	The number of shares matched in the

				NASDAQ Cross.
Stock	19	8	Alpha	Stock symbol, right padded with spaces
Cross Price	27	4	Price (4)	The price at which the cross occurred. Refer to Data Types for field processing notes.
Match Number	31	8	Integer	The NASDAQ generated day-unique Match Number of this execution.
Cross Type	39	1	Alpha	The NASDAQ cross session for which the message is being generated. “O” = NASDAQ Opening Cross. “C” = NASDAQ Closing Cross. “H” = Cross for IPO and halted / paused securities. “P” = NASDAQ Cross Network: Intraday Cross and Post-Close Cross

### 4.5.3 Broken Trade / Order Execution Message

The Broken Trade Message is sent whenever an execution on NASDAQ is broken. An execution may be broken if it is found to be “clearly erroneous” pursuant to [NASDAQ’s Clearly Erroneous Policy](#). A trade break is final; once a trade is broken, it cannot be reinstated.

Firms that use the ITCH feed to create time-and-sales displays or calculate market statistics should be prepared to process the broken trade message. If a firm is only using the ITCH feed to build a book, however, it may ignore these messages as they have no impact on the current book.

BROKEN TRADE MESSAGE				
Name	Offset	Length	Value	Notes
Message Type	0	1	“B”	Broken Trade Message.
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Match Number	11	8	Integer	The NASDAQ Match Number of the execution that was broken. This refers to a Match Number from a previously transmitted Order Executed Message, Order Executed With Price Message, or Trade Message.

### 4.6 Net Order Imbalance Indicator (NOII) Message

NASDAQ disseminates NOII data at 5-second intervals in the minutes leading up to the NASDAQ Opening Cross and NASDAQ Closing Cross.

- For the NASDAQ Opening Cross, NOII messages will be disseminated during the two minutes leading up to the start of market hours.
- For the NASDAQ IPO, Halt and Imbalance Crosses, NOII messages will be disseminated during the quote only period. The first NOII message will be disseminated approximately five seconds after the Stock Trading Action message with the “Q” or “R” action value is disseminated.
- For the NASDAQ Closing Cross, NOII messages will be disseminated during the ten minutes leading up to the end of market hours.



TOTALVIEW-ITCH 5.0 INTERFACE SPECIFICATION

NOII MESSAGE				
Name	Offset	Length	Value	Notes
Message Type	0	1	"I"	NOII Message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Paired Shares	11	8	Integer	The total number of shares that are eligible to be matched at the Current Reference Price.
Imbalance Shares	19	8	Integer	The number of shares not paired at the Current Reference Price.
Imbalance Direction	27	1	Alpha	The market side of the order imbalance.  "B" = buy imbalance "S" = sell imbalance "N" = no imbalance "O" = Insufficient orders to calculate
Stock	28	8	Alpha	Stock symbol, right padded with spaces
Far Price	36	4	Price (4)	A hypothetical auction-clearing price for cross orders only. Refer to Data Types for field processing notes.
Near Price	40	4	Price (4)	A hypothetical auction-clearing price for cross orders as well as continuous orders. Refer to Data Types for field processing notes.
Current Reference Price	44	4	Price (4)	The price at which the NOII shares are being calculated. Refer to Data Types for field processing notes.
Cross Type	48	1	Alpha	The type of NASDAQ cross for which the NOII message is being generated  "O" = NASDAQ Opening Cross "C" = NASDAQ Closing Cross "H" = Cross for IPO and halted / paused securities
Price Variation Indicator	49	1	Alpha	This field indicates the absolute value of the percentage of deviation of the Near Indicative Clearing Price to the nearest Current Reference Price.  "L" = Less than 1% "1" = 1 to 1.99% "2" = 2 to 2.99% "3" = 3 to 3.99% "4" = 4 to 4.99% "5" = 5 to 5.99% "6" = 6 to 6.99% "7" = 7 to 7.99% "8" = 8 to 8.99% "9" = 9 to 9.99% "A" = 10 to 19.99% "B" = 20 to 29.99% "C" = 30% or greater Space = Cannot be calculated

## 4.7 Retail Price Improvement Indicator (RPII)

Identifies a retail interest indication of the Bid, Ask or both the Bid and Ask for NASDAQ-listed securities.

Name	Offset	Length	Value	Notes
Message Type	0	1	"N"	Retail Interest message
Stock Locate	1	2	Integer	Locate code identifying the security
Tracking Number	3	2	Integer	NASDAQ OMX internal tracking number
Timestamp	5	6	Integer	Nanoseconds since midnight.
Stock	11	8	Alpha	Stock symbol, right padded with spaces
Interest Flag	19	1	Alpha	"B" = RPI orders available on the buy side "S" = RPI orders available on the sell side "A" = RPI orders available on both sides (buy and sell) "N" = No RPI orders available

## 5 Support

- For general product support for NASDAQ data feeds, please contact NASDAQ OMX Global Data Products at +1 301 978 5307 or [dataproductions@nasdaqomx.com](mailto:dataproductions@nasdaqomx.com).
- For technical support for NASDAQ data feeds, please contact NASDAQ OMX Global Software Development at [devsupport@nasdaqomx.com](mailto:devsupport@nasdaqomx.com).

## Appendix A

### Documentation Revision Control Log

#### March 6, 2015: NASDAQ TotalView-ITCH Version 5.0

Released a new version of TotalView-ITCH documentation to include new Issue Sub-Type Code “EM” for Exchange Traded Managed Funds.

#### January 2, 2015: NASDAQ TotalView-ITCH Version 5.0

Nasdaq RPI program ceased on 12/31/14. Please refer to [Equity Trader Alert #2014-94](#).

#### December 5, 2014: NASDAQ TotalView-ITCH Version 5.0

Released a new version of TotalView-ITCH documentation to include missing Issue Sub-Type Codes (Appendix E):

- AI – Alpha Indexes ETNs
- CO – Collateralized Mortgage Obligation
- EU – Equity Units
- F – HOLDERS
- IR – Interest Rate
- IW – Index Warrant
- J – Corporate Backed Trust Security
- PP – Poison Pill
- Q – Closed -End Funds
- RT – REIT
- SC – Spot Rate Closing
- SI – Spot Rate Intraday
- WC – World Currency Option
- X – Trust
- Y – Other
- Z – NA

#### June 12, 2014: NASDAQ TotalView-ITCH Version 5.0

Released a new version of TotalView-ITCH documentation to support the following change:

- Per [Data Technical News #2014-17](#), Revised the Buy/Sell Indicator value in the Trade Message (Non-Cross) to “Always ‘B’ regardless of resting side”

#### September 26, 2013: NASDAQ TotalView-ITCH Version 5.0

Released a new version of TotalView-ITCH documentation to support the following change:

- Added stock symbol to several market data messages
- Clarified interpretation of the levels in the MWCB Decline Levels Message

#### August 2, 2013: NASDAQ TotalView-ITCH Version 5.0

Released a new version of the TotalView-ITCH documentation to support the following change:

- Inclusion of the Appendices for Issue Classification and Issue Sub-Type
- Revised IPO Quotation Period Update Message to have stock symbol instead of stock locate
- Changed the length of the IPO Price in the IPO Quotation Period Update Message
- Changed length and values of the Levels in the MWCB Decline Level Message
- Changed the IPO Quotation Release Message Type to “K”
- Revised Timestamp format
- Moved positioning of the Symbol Locate and Tracking Number fields, and updated field offsets accordingly

#### July 10, 2013: NASDAQ TotalView-ITCH Version 5.0

Released a new version of the TotalView-ITCH documentation to support the following change:

- Incorporation of Symbol Locator Codes
- Added Enhanced Symbol Directory
- Added IPO Quotation Release Message
- Added Market-Wide Circuit Breaker (MWCB) Messaging

- MWCB Decline Level Message
- MWCB Status Message
- Addition of an internal tracking number to multiple messages
- Addition of 'C' to the Financial Status Indicator field in the Symbol Directory Message

**March 9, 2013: NASDAQ TotalView-ITCH Version 4.10**

Released a new version of the TotalView-ITCH documentation to support the following change:

- Added the following Trading Action Reason Code for LULD to reflect when the National Best Bid is below the lower price band and/or the National Best Offer is above than the upper price band and the NMS Stock is not in a Limit State.
  - LUDS - Volatility Trading Pause – Straddle Condition

**January 9, 2013: NASDAQ TotalView-ITCH Version 4.10**

Released a new version of the TotalView-ITCH documentation to support the following changes:

- Added the following Trading Action Reason Code:
  - MWC0 - Market Wide Circuit Breaker Halt – Carry over from previous day
- Removed the Trading State, "R", from the Stock Trading Action message.

**January 8, 2013: NASDAQ TotalView-ITCH Version 4.10**

Released a new version of the TotalView-ITCH documentation to support the following changes:

- Modified the Retail Price Interest Indicator Message. Changed the message type from "G" to "N".

**November 2, 2012: NASDAQ TotalView-ITCH Version 4.10**

Released a new version of the TotalView-ITCH documentation to support the following changes:

- Added the "P" value to the Trading State in the Stock Trading Message.
- Modified the values for the Trading Action Reason Codes. Added the following codes:
  - LUDP - Volatility Trading Pause
  - MWC1 - Market Wide Circuit Breaker Halt – Level 1
  - MWC2 - Market Wide Circuit Breaker Halt – Level 2
  - MWC3 - Market Wide Circuit Breaker Halt – Level 3
  - MWCQ - Market Wide Circuit Breaker Resumption
- Removed the Trading Action values related to the Volatility Guard Program. Removed Trading State, "V". Eliminated Trading Action Reason Codes, V1 and V2.
- Added the Retail Price Interest Indicator Message

**November 1, 2011: NASDAQ TotalView-ITCH Version 4.10**

NASDAQ OMX added a new Market Category code in Symbol Directory messages for the BATS BZX Exchange to distinguish BATS-listed issues. New market category code is "Z".

**April 6, 2011: NASDAQ TotalView-ITCH Version 4.10**

NASDAQ OMX added two new Trading Action – Reason codes to Appendix C for the NASDAQ Volatility Guard pilot program. New Reason codes were V1 and V2.

**November 4, 2010: NASDAQ TotalView-ITCH Version 4.10**

NASDAQ OMX updated the Reg SHO message description to reflect the new SEC implementation date.

**October 6, 2010: NASDAQ TotalView-ITCH Version 4.10**

NASDAQ OMX added a note to Trade (Non-Cross) message format stating that the Order Reference Number would be zero for all transactions as of December 6, 2010.

**July 14, 2010: NASDAQ TotalView-ITCH Version 4.10**

NASDAQ OMX added a new Regulation SHO Short Sale Price Test Restricted Indicator message format to be introduced in the fourth quarter of 2010.

**July 2, 2010: NASDAQ TotalView-ITCH Version 4.10**

NASDAQ OMX added new Action Trading code(s) to the Stock Trading Action message for the NASDAQ Volatility Guard trading pause.

**May 25, 2010: NASDAQ TotalView-ITCH Version 4.10**

NASDAQ added two new Trading Action Reason code values (T5 and T7) for single security trading pause situations.

**January 26, 2010: NASDAQ TotalView-ITCH Version 4.10**

Released a new version of the TotalView-ITCH documentation to support the following changes:

- Increased length of the symbol field from 6 characters to 8 characters in multiple message formats in support of the equity symbology initiative.
- Modified the values for the Market Category field in Symbol Directory messages to delineate among NYSE-, NYSE MKT- and NYSE Arca-listed issues.
- Added note to Appendix B to reflect that NASDAQ OMX is reviewing its stock symbol conventions to determine if changes are needed.

**February 3, 2009: NASDAQ TotalView-ITCH Version 4.00**

NASDAQ revised Order Reference Number field definition for the Add Order messages to remove the following statement: "The order reference number is increasing, but not necessarily sequential."

**October 21, 2008: NASDAQ TotalView-ITCH Version 4.00**

NASDAQ releases TotalView-ITCH 4.0 specifications to public. This document includes the following format modifications from earlier versions of the ITCH feed.

- Numeric fields modified to support binary integers
- Time stamp granularity changed to nanoseconds past midnight
- Added Order Replace message
- Updated protocol references to reflect new SoupBinTCP protocol associated with ITCH 4.0 feed.

**October 20, 2008: NASDAQ TotalView-ITCH Version 3.10**

NASDAQ releases TotalView-ITCH 3.1 specifications to the public. This document included the following format modifications from earlier versions of the ITCH feed.

- Expanded Order Reference Number and Match ID field size in all Order and Trade related messages to 12 bytes (from 9 bytes)
- Added Order Replace message
- Updated protocol references to reflect new network support documentation associated with ITCH 3.1

**September 16, 2008: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ corrected a few corporate references in the TotalView-ITCH 3.0 specifications document. No material changes were made.

**June 10, 2008: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ modified the TotalView-ITCH 3.0 specifications document to add new codes for emergency market condition (EMC) situations:

- Section 4.2 – System Event Message. Added the following three codes for EMC situations.
  - A = Emergency market condition – halt
  - R = Emergency market condition – quote only period
  - B = Emergency market condition – resumption

- Section 4.6.2 – Cross Trade message: Added cross type of “E” for EMC situations. Also added processing note to indicate that NASDAQ will begin to generate a cross trade message for all active issues in the system beginning in the third quarter of 2008.

**March 5, 2008: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ modified the TotalView-ITCH 3.0 specifications document to reflect a change in the Message Type value for the new Market Participant Position message format to be added to data stream on or about April 21, 2008:

- Section 4.3.3 – Market Participant Position. The message type value for this message should be “L”.

**January 16, 2008: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ modified the TotalView-ITCH 3.0 specifications document to reflect the following new message format to be added to data stream on or about April 21, 2008:

- Section 4.3.3 – Market Participant Position. This message is designed to provide Primary Market Maker status, Market Participant status and Market Maker mode fields used by some firms to comply with market regulations.

**April 30, 2007: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ modified the TotalView-ITCH 3.0 specifications document to reflect the following changes:

- Section 4 – For clarity reasons, the Data Type field was updated for all formats to delineate between alphabetic and alphanumeric fields.
- Section 4.3.1 – Within the Issue Directory message format, NASDAQ updated the code list for the Market Category field to denote that space is an allowable value. The Market Category field may be space filled if the security symbol is associated with a test issue OR if NASDAQ Operations adds a production issue to its online systems intra-day.

**February 15, 2007: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ modified the TotalView-ITCH 3.0 specifications document to reflect the following changes:

- 4.3.2 – Stock Trading Action. Updated document to reflect actual system processing rules for pre-opening trading action spin.
- Appendix B – Stock Symbol Convention. Updated document to reflect the most current URL links to NASDAQ symbology matrices.

**October 2, 2006: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ modified the TotalView-ITCH 3.0 specifications document to reflect the following changes:

- Section 4.1 – Timestamp. Added sentence to address sequencing of second and millisecond timestamps.
- Corrected the numbering in remainder of section 4.

**August 22, 2006: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ modified the TotalView-ITCH 3.0 specification document to reflect the following changes:

- Section 4.2 – System Events: Updated the explanations for the “O”, “Q”, “M” and “M” events to more accurately reflect the feed processing.
- Appendix B – Stock Symbol Conversion: Please contact NASDAQ Systems Engineering for up-to-date symbol suffix matrix.

**July 11, 2006: NASDAQ TotalView-ITCH Version 3.00**

NASDAQ releases TotalView-ITCH 3.0 specifications to the public. This document included the following format modifications from earlier versions of the ITCH feed.

- Moved the timestamp from the individual messages to separate seconds and milliseconds messages for bandwidth and processing efficiency reasons.

- Added the following new messages to be consistent with TotalView-Aggregated feed:
  - Stock Directory
  - Net Order Imbalance Indicator
- Replaced Halt/Resume message with Stock Trading Action message to be more consistent with other NASDAQ data feeds.
- Updated Add Order messages in the following ways:
  - Updated Add Order (A) message to remove the display field. Firms should process all orders for NASDAQ quotation displays.
  - Added new Add Order – MPID Attribution (F) message as NASDAQ execution system will support market participant attribution at the order level.
- Updated Modify Order messages in the following ways:
  - Updated Order Executed message to support Printable field. Printable field will be used to denote cross transactions.
  - Added new Order Executed With Price Message (C) for situations where the execution price is different from the display price of an order. This message is intended to reflect situations where there was price improvement with the NASDAQ system.
  - Added new Order Delete (D) message format to reflect when an order is cancelled in full. This change was done for bandwidth efficiency reasons.
- Added Cross Trade (Q) message to reflect bulk transactions such as the NASDAQ Crosses.

**February 24, 2006: NASDAQ TotalView-ITCH Version 2.0a**

- Replaced all references to INET to NASDAQ.
- Added attribution to "Add Order". This will be the first variable length message in ITCH. It was done to save bandwidth by not sending MMIDs for non-attributed orders.
- Added Halt/Resume message.

**March 17, 2004: ITCH Version 2.00**

- Replaced all references to Island (ISLD) with Inet ATS (INET).

**December 21, 2000: ITCH Version 2.00**

- Corrected the definition for price fields in the spec to match the actual behavior. Price fields are padded on the left with spaces, not zeros.

**November 5, 2001 – ITCH Version 2.0**

- Changed price field format to 6 whole number digits followed immediately by 4 decimal digits. The decimal point was no longer included in the field but implied by position. This reduced the bandwidth of the stream significantly and makes for much easier parsing and processing of price values.
- Changed timestamps to be stated as milliseconds past midnight rather than hundredths of seconds past midnight.
- Replaced the End of Session System event with the End of Day System Event. Although the messages looked identical, the semantics were different. The old End of Session System Event told subscribers that there would be no more messages during that session. The new End of Day System Event indicated that there are no more orders today, but there may still be more messages like Cancels on open orders and Breaks on previously executed orders.
- Removed language about any orders remaining on the book at the end of the session being dead. INET automatically cancels all open orders at the end of the day, so firms should not have any left-over orders on the book at the end of the session.
- Reduced the size of all shares fields from 9 digits to 6 digits.
- Removed Contra Broker Code from the Order Executed and Trade messages.

**January 19, 2000 – ITCH Version 1.00**

- Removed implementation ideas from document.
- Moved all session management to a higher-level protocol. ITCH now only specifies the actual messages concerning orders added and executed on the INET book.
- Added the Broken Trade Message to let you know when an execution is broken.

- Added the Print Message to enable people to build INET time-and-sales, INET last trade, and INET volume services.
- Removed the Timeout "why" for canceled orders.
- Removed the Text Message type.
- Increased the precision of timestamps to hundredths of seconds.
- Added Match Number to all executions.

**May 12, 1998 – ITCH Version 0.22**

- Added the Display field to the Add Order Message. This field denotes if the order is displayable in INET quote to the NASDAQ SIP under the SEC order handling rules.

**November 20, 1997 – ITCH Version 0.21**

- Changed documentation to show that the Fixed Rewind Request Message type is "W" . Earlier document should the type as "R" in error.
- Changed documentation for Login Request Message to note that a firm's connection would expire if it failed to log in within 30 seconds of initial login.
- Fixed the description of the Sequence Number field in the Heartbeat Message. The Sequence number should be the next expected sequence number, even during a rewind.

**October 1, 1997 – ITCH Version 0.20**

- Released initial product specification, in draft format, to a few developers for comment.



## **Appendix B**

### **Stock Symbol Convention**

For NASDAQ-listed issues, NASDAQ OMX currently restricts its symbol length to a maximum of 8 characters. For common stock issuances, NASDAQ, PSX and BX will only assign root symbols of 1 to 4 characters in length with possible fifth and or sixth character denoting a suffix. In certain instances, a dot "." delimiter may be applied to symbols after the root and between the suffix eg., XXXX.A. For subordinate securities, NASDAQ and BX will assign a 5 character symbol for which the last character relays information about the issue class or issue type. For the current list of fifth and or six character symbol suffixes, please refer to [Ticker Symbol Convention](#) page on the NASDAQ OMX Trader website.

For NYSE-, NYSE MKT- and NYSE Arca-listed securities with subordinate issue types, please refer to [Ticker Symbol Convention](#) page on the NASDAQ OMX Trader website.

## Appendix C

### Trading Action – Reason Codes

For NASDAQ-listed issues, NASDAQ acts as the primary market and has the authority to institute a trading halt or trading pause in an issue due to news dissemination or regulatory reasons.

For CQS issues, NASDAQ abides by any regulatory trading halts and trading pauses instituted by the primary or listing market as appropriate.

For both issue types, NASDAQ may also halt trading for operational reasons.

NASDAQ will send out a trading action message to inform its market participants when the trading status of an issue changes. For informational purposes, NASDAQ also attempts to provide the reason for each trading action update. For bandwidth efficiency reasons, NASDAQ uses a 4-byte code for the reason on its outbound data feeds.

REASON CODES FOR TRADING HALT ACTIONS	
Code	Value
T1	Halt News Pending
T2	Halt News Disseminated
T5	Single Security Trading Pause In Effect
T6	Regulatory Halt — Extraordinary Market Activity
T8	Halt ETF
T12	Trading Halted; For Information Requested by Listing Market
H4	Halt Non-Compliance
H9	Halt Filings Not Current
H10	Halt SEC Trading Suspension
H11	Halt Regulatory Concern
O1	Operations Halt; Contact Market Operations
LUDP	Volatility Trading Pause
LUDS	Volatility Trading Pause – Straddle Condition
MWC1	Market Wide Circuit Breaker Halt – Level 1
MWC2	Market Wide Circuit Breaker Halt – Level 2
MWC3	Market Wide Circuit Breaker Halt – Level 3
MWC0	Market Wide Circuit Breaker Halt – Carry over from previous day
IPO1	IPO Issue Not Yet Trading
M1	Corporate Action
M2	Quotation Not Available
Space	Reason Not Available

REASON CODES FOR QUOTATION/TRADING RESUMPTION ACTIONS	
Code	Value
T3	News and Resumption Times
T7	Single Security Trading Pause / Quotation Only Period
R4	Qualifications Issues Reviewed/Resolved; Quotations/Trading to Resume
R9	Filing Requirements Satisfied/Resolved; Quotations/Trading To Resume
C3	Issuer News Not Forthcoming; Quotations/Trading To Resume
C4	Qualifications Halt ended; Maintenance Requirements Met; Resume
C9	Qualifications Halt Concluded; Filings Met; Quotes/Trades To Resume
C11	Trade Halt Concluded By Other Regulatory Auth.; Quotes/Trades Resume
MWCQ	Market Wide Circuit Breaker Resumption
R1	New Issue Available
R2	Issue Available
IPOQ	IPO Security Released for Quotation (NASDAQ Securities Only)
IPOE	IPO Security — Positioning Window Extension (NASDAQ Securities Only)
Space	Reason Not Available

## Appendix D

### Issue Classification Values

Identifies the security class for the issue as assigned by NASDAQ

<b>CODES FOR ISSUE CLASSIFICATION VALUES</b>	
<b>Code</b>	<b>Value</b>
A	American Depositary Share
B	Bond
C	Common Stock
F	Depository Receipt
I	144A
L	Limited Partnership
N	Notes
O	Ordinary Share
P	Preferred Stock
Q	Other Securities
R	Right
S	Shares of Beneficial Interest
T	Convertible Debenture
U	Unit
V	Units/Benif Int
W	Warrant

## Appendix E

### Issue Sub-Type Values

CODES FOR ISSUE CLASSIFICATION VALUES	
Code	Value
A	Preferred Trust Securities
AI	Alpha Index ETNs
B	Index Based Derivative
C	Common Shares
CB	Commodity Based Trust Shares
CF	Commodity Futures Trust Shares
CL	Commodity-Linked Securities
CM	Commodity Index Trust Shares
CO	Collateralized Mortgage Obligation
CT	Currency Trust Shares
CU	Commodity-Currency-Linked Securities
CW	Currency Warrants
D	Global Depository Shares
E	ETF-Portfolio Depository Receipt
EG	Equity Gold Shares
EI	ETN-Equity Index-Linked Securities
EM	Exchange Traded Managed Funds*
EN	Exchange Traded Notes
EU	Equity Units
F	HOLDRS
FI	ETN-Fixed Income-Linked Securities
FL	ETN-Futures-Linked Securities
G	Global Shares
I	ETF-Index Fund Shares
IR	Interest Rate
IW	Index Warrant
IX	Index-Linked Exchangeable Notes
J	Corporate Backed Trust Security
L	Contingent Litigation Right
LL	Identifies securities of companies that are set up as a Limited Liability Company (LLC)
M	Equity-Based Derivative
MF	Managed Fund Shares
ML	ETN-Multi-Factor Index-Linked Securities
MT	Managed Trust Securities
N	NY Registry Shares
O	Open Ended Mutual Fund
P	Privately Held Security
PP	Poison Pill
PU	Partnership Units
Q	Closed-End Funds
R	Reg-S
RC	Commodity-Redeemable Commodity-Linked Securities
RF	ETN-Redeemable Futures-Linked Securities
RT	REIT
RU	Commodity-Redeemable Currency-Linked Securities
S	SEED
SC	Spot Rate Closing
SI	Spot Rate Intraday

TOTALVIEW-ITCH 5.0 INTERFACE SPECIFICATION

T	Tracking Stock
TC	Trust Certificates
TU	Trust Units
U	Portal
V	Contingent Value Right
W	Trust Issued Receipts
WC	World Currency Option
X	Trust
Y	Other
Z	Not Applicable

\* Nasdaq is planning to introduce Exchange Traded Managed Funds (ETMFs) in 2015. EMTF prices will be stated in proxy price on this feed. Nasdaq is expected to issue vendor display requirements for this new asset class.