

Nasdaq Bond TotalView

ITCH 5.0

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1 Overview

Nasdaq Bond TotalView ITCH SM is a direct data feed offered by the Nasdaq Stock Market, LLC. Nasdaq Corporate Bonds ITCH features the following data elements for all corporate bonds traded via the Nasdaq execution systems:

- **Order Messages** – to provide the full depth of the visible orders via the standard ITCH format. ITCH uses a series of order messages to track the life of a customer order.
- **Trade Messages** – to ensure that customers have complete information about trading activity on the Nasdaq platform, ITCH supports trade messages to report the matching of non-displayed orders in the Nasdaq system.
- **Administrative Messages** – such as trading actions and symbol directory:
 - the Symbol Directory provides basic reference data for instruments traded on the platform
 - Trading action messages inform participants when an instrument is halted or released
- **Event Message** – indicating important events such as Start-of-Day or End-of-Day

2 Architecture

The Nasdaq ITCH feed is made up of a series of sequenced messages, where the length and layout of a given message is based upon the message type. ITCH messages are typically delivered by a lower level transport protocol that provides sequencing and delivery guarantees.

Nasdaq Bond TotalView offers the ITCH data feed via the [MoldUDP64](#) transport.

3 Data Types

Alpha fields are fixed width, left justified ASCII fields, padded on the right with spaces.

Numeric fields are binary formatted, big-endian numbers. Four flavors of numeric fields are supported: Longs (8 bytes), Integers (4 bytes), Shorts (2 bytes), and Bytes (1 byte). Unless otherwise noted, all numeric fields are unsigned.

Decimal values are encoded as a numeric field with an implied number of decimal places. Short decimals (2 bytes) have an implied 2 decimal places; integer decimals (4 bytes) have an implied 4 decimal places; long decimals (8 bytes) have an implied 10 decimal places.

Boolean fields are Numeric Bytes, with binary values of 1 for true and 0 for false.

Timestamps are formatted as a Numeric Long, and express the time as nanoseconds since midnight, Eastern Time.

Unless otherwise noted, Prices are formatted as a Decimal Integer (with an implied 4 decimal places) and represent the price as a percent of par. For example, a price of 995000 represents a value of 99.5% of par.

The Quantity in an order is formatted as a Numeric Integer, and reflects the size of the order in terms of the number of bond increments represented.

4 Message Formats

4.1 System Event Messages

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

System Event Message (S)				
<i>Name</i>	<i>Offset</i>	<i>Length</i>	<i>Type/Value</i>	<i>Notes</i>
Message Type	0	1	"S"	System Event Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Event Code	9	1	Alpha	See System Event Codes below

The Nasdaq Nasdaq Bond TotalView system currently supports the following event codes:

System Event Codes		
<i>Event Code</i>	<i>Name</i>	<i>Description</i>
"O"	Start of Messages	This is the first message of the day
"S"	Start of System Hours	Indicates that NASDAQ is open and ready to accept orders
"Q"	Start of Market Hours	Indicates that Normal Market Hours has begun; pre-market has ended
"M"	End of Market Hours	Indicates that Normal Market Hours has ended; post-market has begun
"E"	End of System Hours	Indicates that NASDAQ is now closed and will not accept new orders
"C"	End of Messages	This is the last message of the day

4.2 Instrument Related Messages

4.2.1 Symbol Directory

At the start of each trading day, Nasdaq disseminates a symbol directory message for all of the active symbols in the Nasdaq Bond TotalView ITCH system.

Symbol Directory Message (R)				
<i>Name</i>	<i>Offset</i>	<i>Length</i>	<i>Type/Value</i>	<i>Notes</i>
Message Type	0	1	"R"	Symbol Directory Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Symbol	9	12	Alpha	
Status Indicator	21	1	Alpha	"S" = Suspended "N" = Normal
Bond Issuance Date	22	4	Numeric	YYYYMMDD
Currency	26	3	Alpha	ISO Currency Code

Maturity Date	29	4	Numeric	YYYYMMDD
Current Outstanding Amount	33	8	Numeric	
Clearing Method	41	1	Alpha	Indicates the clearing method. "X" = Ex-Clearing "N" = DTCC/NSCC UTC Eligible "D" = DTC Eligible But Not NSCC Eligible
Quantity Multiplier	42	4	Numeric	Always equal to Face Value
Minimum Trade Size	46	4	Numeric	
Minimum Increment	50	4	Numeric	

4.2.2 Trading Action

Nasdaq uses this administrative message to communicate to the trading community the current trading status of an instrument.

Prior to the start of system hours, Nasdaq will send out a Trading Action spin. In the spin, Nasdaq will send a Trading State of "T" (Trading on Nasdaq) for all instruments eligible for trading at the start of system hours. If an instrument is absent from the pre-opening Trading Action spin, firms should assume that the instrument is halted on the Nasdaq Corporate Bonds system.

Please note that instruments may be halted intraday for regulatory or operational reasons.

Trading Action Message (H)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	"H"	Trading Action Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Symbol	9	12	Alpha	
Trading State	21	1	Alpha	Indicates the current trading state for the instrument. "H" = Halted "T" = Trading
Reason	22	4	Alpha	See Appendix B

4.3 Order Add Messages

4.3.1 Order Add Message

An Order Add message indicates that the Nasdaq Bond TotalView ITCH system has accepted a visible order into the book. An order is identified by an Order Reference number which uniquely identifies the order for a given trading day.

Order Add Message (A)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	"A"	Order Add Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Order Reference Number	9	8	Numeric	The unique reference number assigned to the new order at the time of receipt
Buy/Sell Indicator	17	1	Alpha	"B" = Buy "S" = Sell
Quantity	18	4	Numeric	The number of bond increments in the order
Symbol	22	12	Alpha	

Price	34	4	Price	The display price of the new order
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4.4 Order Modify Messages

4.4.1 Order Executed Message

This message is sent whenever a visible order 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.

By combining the executions from both types of the Order Executed Messages and the Trade Messages, it is possible to build a complete view of all executions that happened on the Nasdaq Corporate Bonds platform. A trade is identified by a Match Number which uniquely identifies the execution for a given trading day.

Order Executed Message (E)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	"E"	Order Executed Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Order Reference Number	9	8	Numeric	Identifies the order being executed
Executed Quantity	17	4	Numeric	The number of bond increments executed
Match Number	21	8	Numeric	The unique match identifier assigned to this trade

4.4.2 Order Executed With Price Message

This message is sent whenever a visible order on the book is executed in whole or in part, at a price different from the initial display price. Since the execution price may differ from the display price of the original order, the execution price is included in the message.

Order Executed With Price Message (C)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	"C"	Order Executed With Price Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Order Reference Number	9	8	Numeric	Identifies the order being executed
Executed Quantity	17	4	Numeric	The number of bond increments executed
Match Number	21	8	Numeric	The unique match identifier assigned to this trade
Printable	29	1	Boolean	Indicates if the execution should be reflected on time and sales displays and volume calculations. 0 = False (non-printable) 1 = True (printable)
Execution Price	30	4	Price	The price at which the order execution occurred

4.4.3 Order Cancel Message

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

Order Cancel Message (X)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	"X"	Order Cancel Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Order Reference Number	9	8	Numeric	Identifies the order being cancelled
Cancel Quantity	17	4	Numeric	The number of bond increments cancelled

4.4.4 Order Delete Message

This message is sent whenever a visible order on the book is being fully cancelled. The remaining quantity of the order is no longer accessible and the order should be removed from the book.

Order Delete Message (D)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	"D"	Order Delete Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Order Reference Number	9	8	Numeric	Identifies the order being deleted

4.4.5 Order Replace Message

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

Order Replace Message (U)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	"U"	Order Replace Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Original Order Reference Number	9	8	Numeric	The reference number of the original order being replaced
New Order Reference Number	17	8	Numeric	The reference number assigned to the new replacement order.
Quantity	25	4	Numeric	The number of bond increments in the new order
Price	29	4	Price	The display price of the new order

4.5 Trade Messages

4.5.1 Trade Message

The trade message is designed to provide execution details for continuous market match events involving non-displayable order types.

Since no Order Add Message is generated on ITCH when a non-displayed order is received, Nasdaq cannot use the Order Executed message for these matches. Rather, a Trade Message is transmitted each time a non-displayable booked order is executed in whole or in part, and the Trade Message carries extra reference data to fully characterize the execution.

Trade Message (P)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	"P"	Trade Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Quantity	9	4	Numeric	The number of bond increments executed
Symbol	13	12	Alpha	
Price	25	4	Price	The price at which the trade occurred
Match Number	29	8	Numeric	The unique match identifier assigned to this trade

4.5.2 Trade Break Message

This message is sent whenever an execution on the Nasdaq Bond TotalView ITCH system 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.

Trade Break Message (B)				
Name	Offset	Length	Type/Value	Notes
Message Type	0	1	“B”	Trade Break Message
Timestamp	1	8	Timestamp	Nanoseconds since midnight
Match Number	9	8	Numeric	The 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.

5 Support

- For general product support for Nasdaq data feeds, please contact Nasdaq Global Information Services at +1 301 978 5307 or dataproductions@nasdaq.com.
- For technical support for Nasdaq data feeds, please contact Nasdaq Global Software Development at devsupport@nasdaq.com

Appendix A – Revision History

Version	Date	Notes
0.1	2018-06-28	Initial version

Appendix B – Trading Action Reason Codes

TBD