Market Data Feed – Version 1.1

Glimpse for Best of Nasdaq Options (BONO)

1. Overview

A complement to the Best of Nasdaq Options (BONO) real-time data feed products, Glimpse for Best of Nasdaq Options (BONO) 1.0 is a point-to-point data feed connection that provides direct data feed customers with the current Top of Book in the Nasdaq execution system. Glimpse for Best of Nasdaq Options (BONO) 1.0 uses the same data formats as the BONO 3.10 data feed products.

2. Architecture

Glimpse for Best of Nasdaq Options (BONO) 1.0 is a point-to-point data feed product comprised of a series of sequenced messages. Each message is variable in length based on the message type. The messages that make up the Glimpse for Best of Nasdaq Options (BONO) 1.0 protocol are typically delivered using a higher level protocol that takes care of sequencing and delivery guarantees.

Nasdaq currently offers the Glimpse for Best of Nasdaq Options (BONO) 1.0 data feed in the SoupBinTCPv3.00 protocol option only. Please note that Glimpse users must login to SoupBinTCPv3.00 with sequence 1 to correctly receive data.

3. Data Types

All Alpha or Alphanumeric fields are left justified and padded on the right with spaces.

All Integer fields are unsigned big-endian (network byte order) binary encoded numbers unless otherwise specified. Integers may be 1, 2 or 4 bytes long.

Prices are 2 byte or 4 byte Integer fields. When a 4 byte price is converted to a decimal format, prices are in fixed point format with 6 whole number places followed by 4 decimal digits. When a 2 byte price is converted to a decimal format, prices are in fixed point format with 3 whole number places followed by 2 decimal digits.

4. Message Formats

Upon logon to the Glimpse for Best of Nasdaq Options (BONO) service, firms will receive the following data elements with the relevant system timestamp:

- System Event messages;
- Symbol Directory messages for all security symbols in the Nasdaq execution system;
- Security Open message if either the opening or closing is done for an option;
- Trading Action message to inform market participants when a specific security is halted or released for trading in the options market;
- Best Bid and Offer Quotations indicating the best bid and offer position, with aggregated size, based on displayable order and quote interest in the Nasdaq execution system at the time of login request;
- Glimpse Snapshot message that reflects the Best of Nasdaq Options (BONO) sequence number at the time that the Glimpse for BONO 1.0 spin was requested;
- Best of Nasdaq Options (BONO) transmit trade information. Trades are not sent by Glimpse for BONO 1.0.

Please note that Glimpse for BONO 1.0 uses the same Seconds, Options Directory, Trading Action, Security Open/Closed, Best Bid AND Ask and Best Bid OR Ask message formats as the Best of Nasdaq Options (BONO) data feed.

At the end of the spins, Glimpse for BONO will send a Snapshot message to denote where firms should begin processing real-time updates via the Best of Nasdaq Options (BONO) product.

4.1. Time Messages

For bandwidth efficiency reasons, Glimpse for BONO 1.0 and Best of Nasdaq Options (BONO) product disseminate the timestamp into two separate pieces:

Timestamp Portion	**Message Type**	**Notes**
Seconds	Standalone message	Reflects the number of seconds past midnight (U.S. Eastern Time) that the Timestamp message was generated. Note: A Timestamp message will be disseminated for every second for which there is at least one data message.
Nanoseconds	Field within individual data message	Reflects the number of nanoseconds since the most recent Timestamp message

4.1.1. Timestamp Message

For the standalone Timestamp message, the message format will be as follows:

SECONDS MESSAGE				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	“T” = Timestamp Message
Second	1	4	Integer	Number of seconds since midnight. All messages between this Timestamp Message and the next Timestamp Message will have this value of seconds in their timestamp.

4.2. 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	Alpha	"S" = System Event Message
Nanoseconds	1	4	Integer	The sub-second portion of the time, in nanoseconds (0-999999999). The second portion of the time is obtained from the most recent timestamp message.
Event Code	5	1	Alpha	Refer to System Event Codes below
Version	6	1	Integer	Version of the corresponding BONO product.
Sub-version	7	1	Integer	Sub-version of the corresponding BONO product.

SYSTEM EVENT CODES		
Code	***Explanation***	***When (typically)***
"O"	*Start of Messages.* This is always the first message sent in any trading day.	After ~2:00am
"S"	*Start of System Hours.* This message indicates that the options system is open and ready to start accepting orders.	7:00am
"Q"	*Start of Opening Process.* This message is intended to indicate that the options system has started its opening auction process.	9:30:00am
"N"	*Start of Normal Hours Closing Process.* This message is intended to indicate that the options system will no longer generate new executions for options that trade during normal hours.	4:00:00pm
"L"	*Start of Late Hours Closing Process.* This message is intended to indicate that the options system will no longer generate new executions for options that trade during extended hours.	4:15:00pm
"E"	*End of System Hours.* This message indicates that the options system is now closed.	~5:15pm
"C"	*End of Messages*. This is always the last message sent in any trading day.	~5:20pm

4.3. Options Directory Message

At the start of each Glimpse transmission, Nasdaq will disseminate option directory messages for all symbols in the Nasdaq execution system for the current trading day. Please note that the Symbol Directory spin may include halted issues. Halted issues will have a Trading Action message with the current trading state information. No Trading action message indicates that the option is not Halted.

OPTIONS DIRECTORY				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	"D" = Directory Message
Nanoseconds	1	4	Integer	The sub-second portion of the time, in nanoseconds (0-999999999). The second portion is obtained from the most recent timestamp message.
Option ID	5	4	Integer	Option ID for this option, assigned daily, valid for trading day.
Security Symbol	9	6	Alphanumeric	Denotes the option root symbol (security symbol)
Expiration Year	15	1	Integer	Last two digits of the year of the option expiration
Expiration Month	16	1	Integer	Expiration Month of the option (1-12)
Expiration Day	17	1	Integer	Day of the Month of expiration (1-31)
Strike Price	18	4	Integer	Explicit strike price. Refer to Data Types for field processing notes.
Option Type	22	1	Alpha	"C" = Call option "P" = Put option
Source	23	1	Integer	Identifies the source of the option, valid for the trading day.
Underlying Symbol	24	13	Alpha	Denotes the unique symbol assigned to the underlying security within the Exchange System.
Option Closing Type	37	1	Alpha	Denotes which System Event is used to determine when trading ceases in this symbol. "N" = Normal Hours "L" = Late Hours
Tradable	38	1	Alpha	Denotes whether or not this option is tradable at the exchange: "Y" = Option is tradable "N" = Option is not tradable
MPV	39	1	Alpha	Minimum Price Variation for this option: "E" = penny Everywhere "S" = Scaled "P" = penny Pilot

Symbol Directory Notes:

1) The options directory messages are sent once per symbol.
2) The Underlying Symbol is in most cases the same as the industry standard ticker underlying. In rare cases, such as a special settlement symbol, the exchange assigns unique underlying symbols.
3) If an Option is removed from the system intra-day, the options directory message will be sent with "Tradable" field set to "N".
4) The Minimum Price Variation (MPV) has the following values:
    a. "E" – All prices are in penny increments

b. “S” – Prices below $3.00 are in increments of $0.05, prices above $3.00 are in increments of $0.10
c. “P” – Prices below $3.00 are in increments of $0.01, prices above $3.00 are in increments of $0.05

4.4. Trading Action Message

The options system uses this administrative message to indicate the current trading status of an index or equity option within the options market.

Absence of a Trading Action message in the Glimpse snapshot indicates that the Current Trading State is "T" (eligible for trading).

Trading Action Message				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	"H" = Trading Action
Nanoseconds	1	4	Integer	The sub-second portion of the time, in nanoseconds (0-999999999). The second portion of the time is obtained from the most recent timestamp message.
Option ID	5	4	Integer	Integer ID of the option, as defined in the Options Directory Message.
Current Trading State	9	1	Alpha	Reflects the current trading state for the options security in the options market. The allowable values are: "H" = Halt in effect "T" = Trading on the options system

4.5. Security Open/Closed Message

The options system uses this administrative message to indicate when an option has completed the opening process and is now available for auto execution or when the option has closed and is no longer available for auto execution.

Security Open Message				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	“O” = Security Open
Nanoseconds	1	4	Integer	The sub-second portion of the time, in nanoseconds (0-999999999). The second portion of the time is obtained from the most recent timestamp message.
Option ID	5	4	Integer	Integer ID of the option, as defined in the Options Directory Message.
Open State	9	1	Alpha	Reflects the current eligibility for auto execution of the options security in the options market. The allowable values are: Y = Open for auto execution N = Closed for auto execution

Note: Recipients should continue to process the Trading Action message in order to determine if a contract is in a Halt state for the day. A security open message should ***NOT*** override the Trading action message indicating if an index or equity option is halted. Recipients should use both messages in tandem to indicate if the issue is halted and/or or open for auto execution.

4.6. Best Bid AND Ask Update – Short Form

The quote will reflect the latest, highest price displayable in the options system for buy orders/quotes and the lowest price displayable in the options system for sell orders/quotes at the time of the Glimpse snapshot.

The Quote Condition applies to both the bid and ask sides.

There are two forms of the Best Bid AND Ask Update, the Short Form has Prices and Sizes in 2 byte Integer fields. Note that 2 byte Prices are in pennies and does not imply a loss of precision in the price.

BEST BID AND ASK UPDATE – SHORT FORM				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	"q" = Best bid AND ask update
Nanoseconds	1	4	Integer	The sub-second portion of the time, in nanoseconds (0-999999999). The second portion of the time is obtained from the most recent timestamp message.
Option ID	5	4	Integer	Integer ID of the option, as defined in the Options Directory Message.
Quote Condition	9	1	Alpha	<space> = regular quote/autox eligible "F" = Non-firm quote on both bid/ask sides "R" = Rotational quote "X" = Ask side not firm, bid side firm "Y" = Bid side not firm, ask side firm
Bid Price	10	2	Integer	Best bid price. **NOTE:** When converted to a decimal format, this price is in fixed point format with 3 whole number places followed by 2 decimal digits.
Bid Size	12	2	Integer	Aggregated number of contracts on the bid side being displayed in the options market at the current time.
Ask Price	14	2	Integer	Best ask price. **NOTE:** When converted to a decimal format, this price is in fixed point format with 3 whole number places followed by 2 decimal digits.
Ask Size	16	2	Integer	Aggregated number of contracts on the ask side being displayed in the options market at the current time.

4.7. *Best Bid AND Ask Update – Long Form*

This message is the same as the Best Bid AND Ask Update Message – Short Form described above except that Prices and Sizes are 4 byte Integers, the price having 4 implied decimal places.

BEST BID AND ASK UPDATE – LONG FORM				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	“Q” = Best bid AND ask update
Nanoseconds	1	4	Integer	The sub-second portion of the time, in nanoseconds (0-999999999). The second portion of the time is obtained from the most recent timestamp message.
Option ID	5	4	Integer	Integer ID of the option, as defined in the Options Directory Message.
Quote Condition	9	1	Alpha	<space> = regular quote/autox eligible “F” = Non-firm quote on both bid/ask sides “R” = Rotational quote “X” = Ask side not firm, bid side firm “Y” = Bid side not firm, ask side firm
Bid Price	10	4	Integer	Best bid price.
Bid Size	14	4	Integer	Aggregated number of contracts on the bid side being displayed in the options market at the current time.
Ask Price	18	4	Integer	Best ask price.
Ask Size	22	4	Integer	Aggregated number of contracts on the ask side being displayed in the options market at the current time.

4.8. Best Bid OR Ask Update – Short Form

The quote will reflect the latest, highest price displayable in the options system for buy orders/quotes or the lowest price displayable in the options system for sell orders/quotes at the time of the Glimpse snapshot.

For the bid or ask update received, the data feed recipient firm should adjust the quotation bid or ask side *only* for the market side indicated in the message.

For an option with a displayable best bid and offer quote, either the two-sided Best Bid AND Ask Update message will be received, or two one-sided (Best Bid OR Ask Update) quotes will be received. The only difference in the two scenarios is that the two one-sided quotes will have a different time associated with the bid and ask sides.

There are two forms of the Best Bid OR Ask Update, the Short Form has Price and Size in 2 byte Integer fields. Note that 2 byte Price is in pennies and does not imply a loss of precision in the price.

BEST BID OR ASK UPDATE – SHORT FORM				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	Best bid OR ask update: “b” = Quote update bid side “a” = Quote update ask side
Nanoseconds	1	4	Integer	The sub-second portion of the time, in nanoseconds (0-999999999). The second portion of the time is obtained from the most recent timestamp message.
Option ID	5	4	Integer	Integer ID of the option, as defined in the Options Directory Message.
Quote Condition	9	1	Alpha	<space> = regular quote/autox eligible “F” = Non-firm quote on both bid/ask sides “R” = Rotational quote “X” = Ask side not firm, bid side firm “Y” = Bid side not firm, ask side firm
Price	10	2	Integer	Best bid or ask price, the side determined by Message Type. **NOTE:** When converted to a decimal format, this price is in fixed point format with 3 whole number places followed by 2 decimal digits.
Size	12	2	Integer	Aggregated number of contracts on the bid or ask side being displayed in the options market at the current time.

4.9. Best Bid OR Ask Update – Long Form

This message is the same as the Best Bid OR Ask Update Message – Short Form described above except that Prices and Sizes are 4 byte Integers, the price having 4 implied decimal places.

BEST BID OR ASK UPDATE – LONG FORM				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	Best bid OR ask update: “B” = Quote update bid side “A” = Quote update ask side
Nanoseconds	1	4	Integer	The sub-second portion of the time, in nanoseconds (0-999999999). The second portion of the time is obtained from the most recent timestamp message.
Option ID	5	4	Integer	Integer ID of the option, as defined in the Options Directory Message.
Quote Condition	9	1	Alpha	<space> = regular quote/autox eligible “F” = Non-firm quote on both bid/ask sides “R” = Rotational quote “X” = Ask side not firm, bid side firm “Y” = Bid side not firm, ask side firm
Price	10	4	Integer	Best bid or ask price, the side determined by Message Type.
Size	14	4	Integer	Aggregated number of contracts on the bid or ask side being displayed in the options market at the current time.

5. Snapshot Message

The Snapshot message reflects the Best of Nasdaq Options (BONO) sequence number at the time that the Glimpse for BONO 1.0 spin was requested.

To maintain a real-time order display, firms should begin to process real-time Best of Nasdaq Options (BONO) messages beginning with the sequence number stated in this Glimpse for BONO 1.0 snapshot message

ADD QUOTE MESSAGE – LONG FORM				
Name	***Offset***	***Length***	***Value***	***Notes***
Message Type	0	1	Alpha	"M" = End of Snapshot message
Sequence Number	1	20	Numeric	Nasdaq BONO 3.10 sequence number when the Glimpse for BONO 1.0 snapshot was taken. To keep the order book current, firms should process real-time Nasdaq BONO 3.10 messages beginning with the message sequence number reflected in this snapshot message. Note: While BONO 3.10 is a binary data feed, the SoupBINTCP protocol uses ASCII characters for the sequence number in the logon request message format

6. *Support*

- For general product support and technical support for Nasdaq data feeds, please contact Nasdaq Global Information Services at 301.978.5307 or dataproducts@nasdaq.com

Appendix A

Documentation Revision Control Log

November 2, 2017: Glimpse for Best of Nasdaq Options (BONO) 1.1

- Updated the Start of Messages (System Event Code "O") time to ~2:00 am

June 30, 2016: Glimpse for Best of Nasdaq Options (BONO) 1.0

- Initial release