

Nasdaq TRF FilterView 3.0

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1. Product Description:

Nasdaq Last Sale (NLS) is a direct data feed product offered by The Nasdaq Stock Market. NLS will cover the full range of issues including Nasdaq, New York Stock Exchange, and other U.S. regional exchange-listed securities. NLS provides real-time, intra-day traded at a from the Nasdaq/FINRA Trade Reporting Facility (TRF) as well as the Nasdaq execution system.

Market data distributors may use the NLS data feed to feed real-time stock tickers, portfolio trackers, trade alert programs, time and sale graphs, and other display systems.

For pricing and administration information, please refer to the <u>NLS product page</u> on the Nasdaq Trader website.

2. Data Delivery Options

The standard NLS data feed is comprised of trade messages from both Nasdaq and FINRA/Nasdaq TRFs for the full range of U.S. exchange-listedissues.

This specification is for Nasdaq TRF FilterView.

3. Network Protocol Options

Nasdaq will offer the NLS data feed in three protocol options:

- o SoupBinTCP
- O Compressed via SoupBinTCP
- o MoldUDP64

For network support and ordering information, please refer to the <u>Nasdaq Direct Data</u> <u>Products Specifications Page on the Nasdaq Trader website.</u>

4. Architecture

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

5. Data Types

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

Prices are integer fields, supplied with an associated precision. Unless specifically denoted as a Signed Price, Prices are unsigned. When converted to a decimal format, prices are in a 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. Prices are represented with either a 4-byte integer or an 8-byte integer. Whenever possible, the 4-byte representation will be used. However, for prices that exceed the upper limit of a 4-byte price (e.g., 0xFFFFFFFF=\$429,496.7295 for a Price(4)), the longer form for

the price will be used.

Timestamps reflects the Nasdaq system time at which the outbound message was generated. Nasdaq states time as the number of nanoseconds past midnight. The time zone is U.S. Eastern Time. All alphanumeric fields are left-justified, ASCII fields. Padding spaces appear on the right as necessary.

6. Message Formats

1. System Event Message

System Event Messages is used to signal key market or data feed control events.

System Event Mess	System Event Message								
Name	Offset	Len	Value	Value Descript	tion				
Tracking Number	0	2	Integer	Nasdaq interna	Nasdaq internal tracking number				
Timestamp	2	6	Integer	Time Stamp					
Message Type	8	1	Alphanumeri c	S = System Ever	nt Message				
Event Code	9	1	Alphanumeri c		NLS type of system event for which the ng generated. The allowable values are:				
				Code	Value				
			0	Start of Transmissions: Denotes that the NLS system has started its daily transmission schedule.					
		S	S	Start of System Hours: This message indicates that Nasdaq is open and ready to start accepting orders.					
				Q	Start of Market Hours: Denotes the start of the regular US market session. Traditionally, only trade transactions reported during the regular market session are considered to be "last sale" eligible.				
				М	End of Market Hours: Denotes the end of the regular US session.				
				E	End of System Hours: Indicates that Nasdaq is now closed and will not accept any new				

		orders today.	
	С	End of Transmissions: Denotes that the NLS system has ended its daily transmission schedule.	

2. Trade Report for Non-NextShares Trades

The following message is used to relay Nasdaq execution system and TRF trade transactions that are reported for the current business day. Please note that Nasdaq only reports one-side of a trade execution on the Nasdaq Last Sale (NLS) feed and other data feed products.

Trade Report	Message				
Name	Offset	Len	Туре	Value/Description	
Tracking Number	0	2	Integer	Nasdaq internal tracking number	
Time Stamp	2	6	Timestamp	Denotes the time stamp of the Nasdaq system that generated the trade transaction Please note that the Nasdaq and TRF systems maintain separate time stamps.	
Message Type	8	1	Alphanumeric	T = Trade Report	
Market Center Identifier	9	1	Alphanumeric	Denotes the Nasdaq market system that generated the trade report message. The allowable values are:	
				Code Value	
				Q Nasdaq execution system	
				L Nasdaq/FINRA Trade Reporting Facility (TRF) Carteret	
				2 Nasdaq/FINRA Trade Reporting Facility (TRF) Chicago	
Issue Symbol	10	8	Alphanumeric	Denotes the Nasdaq-assigned issue symbol of the security for which the trade report is being generated. For details on Nasdaq symbology, please refer to Appendix B.	
Security Class	18	1	Alphanumeric	Indicates the primary listing market for the issue. Allowable values are:	
				Code Value	
				Q Nasdaq	
				N NYSE	
				A NYSE American	
				P NYSE Arca	
				Z BATS	
				V Investors' Exchange, LLC	

Trade Control Number	19	10	Alphanumeric	Indicates the source's internal control number associated with the given trade transaction. Please note that the Trade Control Number is specific to the source system reflected in the Market Center ID field. This number is used as a key field for trade cancellations and trade corrections.		
Trade Price	29	4	Price (4)	Denotes the transaction.	report price on the trade	
Trade Size	33	4	Integer	Indicates the trade transac	reported number of shares on the ction.	
Sale Condition Modifier	37	4	Alphanumeric	Sale condition defined below	modifier consists of four levels as w.	
Sale Condition	37	1	Alphanumeric	Used for Settlement Type information. Allowable values are:		
Modifier – Level 1				Code	Value	
Leveri				@	Regular Settlement	
				С	Cash Settlement	
				N	Next Day Settlement	
				R	Seller Settlement	
Sale Condition Modifier –	38	1	Alphanumeric		egulation NMS Trade ption Codes. Allowable values	
Level 2				Code	Value	
				F	Intermarket Sweep	
				0	Opening Print	
				4	Derivative Priced	
				5	Re-Opening Print	
				6	Closing Print	
				7	Qualified Contingent Trade (QCT)	
				<space></space>	Not applicable	
Sale Condition Modifier – Level 3	39	1	Alphanumeric		ided Hours or Sold vable values are:	
Levers						
				Т	Extended Hours Trade	
				U	Extended Hours Trade – Reported Late or Out of Sequence	

				Z <space></space>	Sold Last – Reported Late But In Sequence Sold – Out of Sequence Not applicable
Sale Condition Modifier – Level 4	40	1	Alphanumeric	•	I sale condition codes. Please eld is case sensitive. Allowable
				Code	Value
				А	Acquisition
				В	Bunched
				D	Distribution
				Н	Price Variation Transaction
				М	Nasdaq Official Close Price (NOCP)
				Р	Prior Reference Price
				Q	Nasdaq Official Opening Price (NOOP)
				S	Split Trade
				V	Contingent Trade
				W	Average Price Trade ¹
				Х	Cross Trade
				0	Odd lot execution
				Х	Odd Lot Cross execution
				<space></space>	Not applicable

¹ For NLS processing, Nasdaq will use the sale condition modifier of "W" for all Average Price Trades regardless of the listing market center. While the UTP SIP uses the same sale condition modifier code for Nasdaq-listed issues, it should be noted that SIAC / CTA SIP uses a "B" sale condition modifier for Average Price Trades for NYSE-, NYSE American- and NYSE Arca- listed securities.

3. Long Form Trade Report for Non-Next Shares

The following message is used to relay Nasdaq execution system and TRF trade transactions that are reported for the current business day, for long form trades exceeding the upper limit of a 4-byte price. Please note that Nasdaq only reports one-side of a trade execution on the Nasdaq Last Sale (NLS Plus) feed and other data feed products. See Appendix B for a description of each sale condition modifier.

Trade Report Message	Offset	Len	Туре	Value/D	Description	
					•	
Tracking Number	0	2	Integer	Nasdaq ir	nternal tracking number	
Time Stamp	2	6	Integer	that gene note that	Denotes the time stamp of the Nasdaq system that generated the trade transaction. Please note that the Nasdaq and TRF systems maintain separate time stamps.	
Message Type	8	1	Alphanumeric	t = Trade	Report	
Originating Market Center Identifier	9	1	Alphanumeric		the Nasdaq market system that d the trade report message. The	
				Code	Value	
				Q	The Nasdaq Stock Market	
				L	Nasdaq/FINRA Trade Reporting Facility (TRF) Carteret	
				2	Nasdaq/FINRA Trade Reporting Facility (TRF) Chicago	
Issue Symbol	10	8	Alphanumeric	Denotes the Nasdaq-assigned issue symbol of the security for which the trade report is being generated. For details on Nasdaq symbology, please refer to Appendix B.		
Security Class	18	1	Alphanumeric		s the primary listing market for the llowable values are:	
				Code	Value	
				Q	Nasdaq	
				N	NYSE	
				А	NYSE American	
				Р	NYSE Arca	
				Z	BATS	
				V	Investors' Exchange, LLC	

Trade Report Message	9					
Name	Offset	Len	Туре	Value/Descri	ption	
Trade Contro	19	10	Alphanumeric		ource's internal control number ith the given trade transaction.	
l Number				Please note that the Trade Control Number is specific to the source system reflected in the Market Center ID field. This number is used as a key field for trade cancellations and trade corrections.		
Trade Price	29	8	Price (4)	•	ciated with the trade transaction ed. Refer to Data Types for field LS.	
Trade Size	37	4	Integer	Indicates the the trade trai	reported number of shares on nsaction.	
Sale Conditio n Modifier	41	4	Alphanumeric	Sale condition defined below	modifier consists of four levels as w.	
Sale Conditio	41	1	Alphanumeric	Used for Settle Allowable va	ement Type information. lues are:	
n Modifier – Level 1				Code	Value	
				@	Regular Settlement	
				С	Cash Settlement	
				N	Next Day Settlement	
				R	Seller Settlement	
Sale Conditio n Modifier – Level	42	1	Alphanumeric	Used for SEC Regulation NMS Trade Through Exemption Codes. Allowable value are:		
2				Code	Value	
				F	Intermarket Sweep	
				0	Opening Print	
				4	Derivative Priced	
				5	Re-Opening Print	
				6	Closing Print	
				7	Qualified Contingent Trade (QCT)	
				<space></space>	Not applicable	

Trade Report Message	9				
Name	Offset	Len	Туре	Value/Desc	ription
Tale 43 1 Alphanumeric Conditio		Used for Extended Hours or Sold Codes. Allowable values are:			
n Modifier – Level 3				Code	Value
				Т	Extended Hours Trade
				U	Extended Hours Trade – Reported Late or Out of Sequence
				L	Sold Last – Reported Late But In Sequence
				Z	Sold – Out of Sequence
				<space></space>	Not applicable
Sale Conditio n Modifier – Level	Conditio		Used for special sale condition codes. Please note that this field is case sensitive. Allowable values are:		
4				Code	Value
				А	Acquisition
				В	Bunched
				D	Distribution
				Н	Price Variation Transaction
				М	Nasdaq Official Close Price (NOCP)
				Р	Prior Reference Price
				Q	Nasdaq Official Opening Price (NOOP)
				S	Split Trade
				V	Contingent Trade
				W	Average Price Trade ¹
				Х	Cross Trade
				0	Odd lot execution
				Х	Odd Lot Cross execution
				<space></space>	Not applicable

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¹ For NLS processing, Nasdaq will use the sale condition modifier of "W" for all Average Price Trades regardless of the listing market center. While the UTP SIP uses the same sale condition modifier code for Nasdaq-listed issues, it should be noted that SIAC / CTA SIP uses a "B" sale condition modifier for Average Price Trades for NYSE-, NYSE American- and NYSE Arca-listed securities.

4. NextShares Trade Report

The following message is used to relay Nasdaq execution system and TRF trade transactions for Exchange Traded Managed Funds (NextShares) that are reported for the current business day. Please note that Nasdaq only reports one-side of a trade execution on the Nasdaq Last Sale (NLS) feed and other data feed products.

Trade Report Message				
Name	Offset	Len	Туре	Value/Description
Tracking Number	0	2	Integer	Nasdaq internal tracking number
Time Stamp	2	6	Timestamp	Denotes the time stamp of the Nasdaq system that generated the NextShares trade transaction. Please note that the Nasdaq and TRF systems maintain separate time stamps.
Message Type	8	1	Alphanumeric	M = NextShares Trade Report
Market Center Identifier	9	1	Alphanumeric	Denotes the Nasdaq market system that generated the trade report message. The allowable values are: Code Value Q Nasdaq execution system L Nasdaq/FINRA Trade Reporting Facility (TRF) 2 Nasdaq/FINRA Trade Reporting Facility (TRF) Chicago
NextShares Symbol	10	8	Alphanumeric	Denotes the symbol of the NextShares for which the trade report is being generated.
Security Class	18	1	Alphanumeric	Indicates the primary listing market for the issue. Allowable values are:
				Code Value
				Q Nasdaq-Listed Issue

Trade Control Number	19	10	Alphanumeric	Indicates the source's internal control number associated with the given trade transaction. Please note that the Trade Control Number is specific to the source system reflected in the Market Center ID field. This number is used as a key field for trade cancellations and trade corrections.
Proxy Price	29	4	Price (4)	Denotes the proxy price on the NextShares trade transaction.
Trade Size	33	4	Integer	Indicates the reported number of shares on the trade transaction.
NAV Premium/Discount Amount	37	4	Signed Price (4)	The NAV premium or discount that should be applied to the Proxy Price. Please note: This is a signed (+/-) field.
Sale Condition Modifier	41	4	Alphanumeric	Sale condition modifierconsists of four levels as defined below.
Sale Condition Modifier – Level 1	41	1	Alphanumeric	Used for Settlement Type information. Allowable values are: Code Value @ Regular Settlement C Cash Settlement N Next Day Settlemen t
Sale Condition Modifier – Level 2	42	1	Alphanumeric	R Seller Settlement Used for SEC Regulation NMS Trade Through Exemption Codes. Code Value F Intermarket Sweep O Opening Print 4 Derivative Priced 5 Re-Opening Print 6 Closing Print

				7 Qualified Contingent Trade (QCT)
Sale Condition Modifier – Level 3	43	1	Alphanumeric	<pre><space> Not applicable Used for Extended Hours or Sold Codes. Allowable values are:</space></pre>
				Code Value T Extended Hours
				Trade
				U Extended Hours Trade – Reported Late or Out of
				L Sold Last – Reported Late But In Sequence
				Z Sold – Out of Sequence
				<space> Not applicable</space>
Sale Condition Modifier – Level 4	44	1	Alphanumeric	Used for special sale condition codes. Please note that this field is case sensitive. Allowable values are:
				Code Value
				A Acquisition
				B Bunched
				D Distribution
				H Price Variation Transaction
				M Nasdaq Official Close Price (NOCP)
				P Prior Reference Price
				Q Nasdaq Official Opening Price (NOOP)
				S Split Trade
				V Contingent Trade

	W	Average Price Trade ²
	Χ	Cross Trade
	0	Odd lot execution
	х	Odd Lot Cross execution
	<space></space>	Not applicable

² For NLS processing, Nasdaq will use the sale condition modifier of "W" for all Average Price Trades regardless of the listing market center. While the UTP SIP uses the same sale condition modifier code for Nasdaq-listed issues, it should be noted that SIAC / CTA SIP uses a "B" sale condition modifier for Average Price Trades for NYSE-, NYSE American- and NYSE Arca- listed securities.

5. Trade Cancel/Error for Non-NextShares Trades

The following message is used in the event that a Nasdaq or TRF trade transaction is cancelled on the same business day that it is reported.

Name	Offset	Len	Туре	Value/Description
Tracking Number	0	2	Integer	Nasdaq internal tracking number
Time Stamp	2	6	Timestamp	Denotes the time stamp of the Nasdaq system that generated the trade cancel/error message.
Message Type			Alphanumeric	X = Trade Cancel/Error
Market Center Identifier	Center	Denotes the Nasdaq market system that generated the trade report and cancel/error message. The allowable values are:		
				Code Value
				Q Nasdaq Execution System
				L Nasdaq/FINRA Trade Reporting Facility (TRF)
				Facility (TRF) Chicago
Issue Symbol	10	8	Alphanumeric	Denotes the Nasdaq-assigned issue symbol of the security for which the trade report is being generated. For details on Nasdaq symbology, please refer to Appendix B.

Security Class	18	1	Alphanumeric	-	orimary listing market for the ble values are:
				Code	Value
				Q	Nasdaq
				N	NYSE
				А	NYSE American
				Р	NYSE Arca
				Z	BATS
				V	Investors' Exchange, LLC
Original Trade Control Number	19	10	Alphanumeric	associated transaction. Please note th specific to the	ource's internal control number with the given trade at the Trade Control Number is e source system reflected in enter ID field.
Original Trade Price	29	4	Price (4)	Reported price	e for the transaction.
Original Trade Size	33	4	Integer	Reported nu transaction.	imber of shares for
Original Sale Condition Modifier	37	4	Alphanumeric		e condition modifiers as reported al trade transaction.

6. Long Form Trade Cancel/Error for Non-NextShares Trades

The following message is used in the event that a Nasdaq trade transaction, exceeding the upper limit of a 4- byte price, is cancelled on the same business day that it is reported.

Trade Cancel/Erro	Trade Cancel/Error Message									
Name	Offset	Len	Туре	Value/Desci	ription					
Tracking Number	0	2	Integer	Nasdaq internal tracking number						
Time Stamp	2	6	Integer	Denotes the time stamp of the Nasdaq system that generated the trade cancel/error message.						
Message Type	8	1	Alphanumeri c	x = Trade Cano	el/Error					
Originating Market Center Identifier	9	1	Alphanumeri c	Denotes the Nasdaq market system that generated the trade report and cancel/error message. The allowable values are: Code Value						

				Q	Nasdaq
				L	Nasdaq/FINRA TRF
				2	Nasdaq/FINRA Trade Reporting Facility (TRF) Chicago
Issue Symbol	10	8	Alphanumeri c	security for generated.	e Nasdaq-assigned issue symbol of the which the trade report is bein For details on Nasdaq symbology to Appendix B.

Trade Cancel/Error Message										
Name		Offset	Len	Туре	Value/Description					
Security Class		18 1 Alphar		Alphanumeri c	Indicates the Allowable v	e primary listing market for the issue values are:	2.			
					Code	Value				
					Q	Nasdaq				
					N	NYSE				
					А	NYSE American				
					Р	NYSE Arca				
					Z	BATS				
					V	Investors' Exchange, LLC				
Original Tra Control Number	de	19	10	Alphanumeri c	associated v	Indicates the source's internal control number associated with the given trade transaction. Please note that the Trade Control Number is specific to the source system reflected in the Market Center ID				
Original Tra Price	de	29	8	Price (4)		ice for the original trade transactio es for field processing NLS.	n. Refer			
Original Tra Size	de	37	4	Integer	Reported number of shares for original trade transaction.					
Original Sa Condition Modifier	ale	41	4	Alphanumeri c	Defines the sale condition modifiers as reported on the original trade transaction.					

7. Trade Cancel/Error for NextShares

The following message is used in the event that a Nasdaq or TRF trade transaction for an NextShares is cancelled on the same business day that it is reported.

Name	Offset	Len	Туре	Value/Des	scription
Tracking Number	0	2	Integer	Nasdaq number	internal tracking
Time Stamp	2	6	Timestamp	system th	e time stamp of the Nasdaq nat generated the trade or message.
Message Type	8	1	Alphanumeric	O = Trade C	ancel/Error
Market Center Identifier	9	1	Alphanumeric	system that trade repo cancel/erro	ne Nasdaq market at generated the rt and or message. The values are:
				Code	Value
				Q	Nasdaq Execution System
				L	Nasdaq/FINRA Trade Reporting Facility (TRF)
				2	Nasdaq/FINRA Trade Reporting Facility (TRF) Chicago
Issue Symbol	10	8	Alphanumeric	symbol of the trac generated symbology Appendix	l. For details on Nasdaq r, please refer to B.
Security Class	18	1	Alphanumeric		or the primary listing or the issue. Allowable
				Q	Nasdaq

Original Trade Control Number	19	10	Alphanumeric	Indicates the source's internal control number associated with the given trade transaction. Please note that the Trade Control Number is specific to the source system reflected in the Market Center ID field.
Original Trade Price	29	4	Price (4)	Reported proxy price for the transaction.
Original NAV Premium/Discount Amount	33	4	Signed Price (4)	Original NAV premium or discount originally applied to the Proxy Price. Please note: This is a signed (+/-) field.
Original Trade Size	37	4	Integer	Reported number of shares for transaction.
Original Sale Condition Modifier	41	4	Alphanumeric	Defines the sale condition modifiers as reported on the original trade transaction.

8. Trade Correction for Non-NextShares Trades

The following message is used in the event that a TRF trade transaction is corrected on the same business day that it is reported.

Trade Correction Message									
Name	Offset	Len	Туре	Value/Descri	ption				
Tracking Number	0	2	Integer	Nasdaq internal tracking number					
Time Stamp	2	6	Timestamp Denotes the time stamp of the Nasdaq that generated the trade correction message.		ed the trade				
Message Type	8	1	Alphanumeric	C = Trade Corre	ction				
Market Center Identifier	9	1	generated the trad		asdaq market system that e trade report and essage. The allowable values				
				Code	Value				

				Q	Nasdaq Execution System
				L	Nasdaq/FINRA Trade Reporting Facility (TRF)
				2	Nasdaq/FINRA Trade Reporting Facility (TRF) Chicago
Issue Symbol	10	8	Alphanumeric	of the secu trade corre	e Nasdaq-assigned issue symbol urity for which the ction message is being generated. on Nasdaq symbology, please opendix B.
Security Class	18	1	Alphanumeric		ne primary listing market for the wable values are:
				Code	Value
				Q	Nasdaq
				N	NYSE
				А	NYSE American
				Р	NYSE Arca
				Z	BATS
				V	Investors' Exchange, LLC
Original Trade Control Number	19	10	Alphanumeric	associated Please note	ne source's internal control number with the given trade transaction. It that the Trade Control Number is the source system reflected in the liter ID field.
Original Trade Price	29	4	Price (4)	Reported p	rice on the original trade n.
Original Trade Size	33	4	Integer	Reported n trade trans	umber of shares on the original saction.
Original Sale Condition Modifier	37	4	Alphanumeric		lle condition modifiers l with the original า.
Corrected Trade Control Number	41	10	Alphanumeric	associated trade trade trans	e Nasdaq internal control number with the adjusted action. that the Trade Control Number is the Nasdaq host system reflected in

		the Market Center ID field.	I
			l

Corrected Trade Price	51	4	Price (4)	Indicates the price for the corrected trade transaction.
Corrected Trade Size	55	4	Integer	Indicates the number of shares for the corrected trade transaction.
Corrected Sale Conditio n Modifier	59	4	Alphanumeric	Denotes the sale condition modifiers associated with the corrected trade transaction.

9. Long Form Trade Correction for Non-NextShares Trades

The following message is used in the event that a Nasdaq trade transaction is corrected on the same business day that it is reported. Please note this is only for trades that have exceeded the upper limit of a 4-byte price.

Trade Correction Message							
Name	Offset	Len	Туре	Value/Des	scription		
Tracking Number	0	2	Integer	Nasdaq internal tracking number			
Time Stamp	2	6	Integer		Denotes the time stamp of the Nasdaq system that generated the trade correction message.		
Message Type	8	1	Alphanumeri c	c = Trade Correction			
Originating Market Center Identifier	9	1	Alphanumeri c	Denotes the Nasdaq market system that generated the trade report and cancel/error message. The allowable values are:			
				Code	Value		
				Q	Nasdaq		
				L	Nasdaq/FINRA TRF		
				2	Nasdaq/FINRA Trade Reporting Facility (TRF) Chicago		
Issue Symbol	10	8	Alphanumeri c	Denotes the Nasdaq-assigned issue symbol of the security for which the trade correction message is being generated. For details on Nasdaq symbology, please refer to Appendix B.		ng	

Trade Correction Message							
Name	Offset	Len	Туре	Value/Description			
Security Class	18	1	Alphanumeri c	Indicates the primary listing market for the issue. Allowable values are:			
				Code	Value		
				Q	Nasdaq		
				N	NYSE		
				А	NYSE American		
				Р	NYSE Arca		
				Z	BATS		
				V	Investors' Exchange, LLC		
Original Trade Control	19	10	Alphanumeri c		e source's internal control number as ven trade transaction.	sociated	
Number				Please note that the Trade Control Number is specific to the source system reflected in the Market Center ID field.			
Original Trade Price	29	8	Price (4)	Reported price on the original trade transaction. Refer to Data Types for field processing NLS.			
Original Trade Size	37	4	Integer	Reported number of shares on the original trade transaction.			
Original Sale Condition Modifier	41	4	Alphanumeri c	Indicates sal original tra	le condition modifiers associated with nsaction.	h the	
Corrected Trade Control Number	45	10	Alphanumeri c		e Nasdaq internal control number as ljusted trade transaction.	sociated	
				Please note that the Trade Control Number is specific to the Nasdaq host system reflected in the Originating Market Center ID field.			
Corrected Trade Price	55	8	Price (4)		Indicates the price for the corrected trade transaction. Refer to Data Types for field processing NLS.		
Corrected Trade Size	63	4	Integer	Indicates the number of shares for the corrected trade transaction.			
Corrected Sale Condition Modifier	67	4	Alphanumeri c		e sale condition modifiers associated variable transaction.	with the	

10. Trade Correction for NextShares

The following message is used in the event that a TRF trade transaction for an NextShares is corrected on the same business day that it is reported.

Trade Correction Message						
Name	Offset	Len	Туре	Value/Description		
Tracking Number	0	2	Integer	Nasdaq internal tracking number		
Time Stamp	2	6	Timestamp	Denotes the time stamp of the Nasdaq system that generated the trade correction message.		
Message Type	8	1	Alphanumeric	Z = Trade Correction		
Market Center Identifier	9	1	Alphanumeric	Denotes the Nasdaq market system that generated the trade report and cancel/error message. The allowable values are:		
				Code Value		
				Q Nasdaq Execution System		
				L Nasdaq/FINRA Trade Reporting Facility (TRF)		
				2 Nasdaq/FINRA Trade Reporting Facility (TRF)		
Issue Symbol	10	8	Alphanumeric	Denotes the Nasdaq-assigned issue symbol of the security for which the trade correction message is being generated. For details on Nasdaq symbology, please refer to Appendix B.		
Security Class	18	1	Alphanumeric	Indicates the primary listing market for the issue. Allowable values are:		
				Code Value		
				Q Nasdaq-Listed Issue		
Original Trade Control Number	19	10	Alphanumeric	Indicates the source's internal control number associated with the given trade transaction.		
				Please note that the Trade Control Number is specific to the source system reflected in the Market Center ID field.		
Original Trade Price	29	4	Price (4)	Reported proxy price on the original trade transaction.		

Original NAV Premium/Discount Amount	33	4	Signed Price (4)	Original NAV premium or discount originally applied to the Proxy Price. Please note: This is a signed (+/-) field.
Original Trade Size	37	4	Integer	Reported number of shares on the original trade transaction.
Original Sale Condition Modifier	41	4	Alphanumeric	Indicates sale condition modifiers associated with the original transaction.
Corrected Trade Control Number	45	10	Alphanumeric	Indicates the Nasdaq internal control number associated with the adjusted trade transaction.
				Please note that the Trade Control Number is specific to the Nasdaq host system reflected in the Market Center ID field.
Corrected Trade Price	55	4	Price (4)	Indicates the price for the corrected trade transaction in proxy price.
Corrected NAV Premium/Discount Amount	59	4	Signed Price (4)	Indicates the corrected NAV premium or discount originally applied to the Proxy Price. Please note: This is a signed (+/-) field.
Corrected Trade Size	63	4	Integer	Indicates the number of shares for the corrected trade transaction.
Corrected Sale Condition Modifier	67	4	Alphanumeric	Denotes the sale condition modifiers associated with the corrected trade transaction.

7. Administrative Messages

To help firms create a full display, Nasdaq supports the following administrative messages: (1) Stock Trading Action, (2) Symbol Directory, (3) Reg SHO Short Sale Price Test Restricted Indicator (4) Adjusted Closing Price.

1. 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. the	If a security is absent from

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.

Name	Offset	Len	Туре	Value/Desc	ription	
Tracking Number	0	2	Integer		ernal tracking number	
Time Stamp	2	6	Timestamp	Time Stamp).	
Message Type	8	1	Alphanumeric	H = Trading	Action	
Issue Symbol	9	8	Alphanumeric	Nasdaq-assigned indicator for issue for which the trading action message is being generated. For details on Nasdaq symbology, please refer to Appendix B.		
Security 17 1 Class		1	Alphanumeric		e primary listing market for the issue. values are:	
		Code		Value		
		Q		Nasdaq		
		N	NYSE			
				А	NYSE American	
				Р	NYSE Arca	
				Z	BATS-Listed Issue	
				V	Investors' Exchange, LLC	
Trading		1	Alphanumeric	Reflects the	current trading state for the issue.	
State				Code	Value	
				Н	Halted across all U.S. equity markets / SROs	

				Р	Paused across all U.S. equity markets / SROs (Nasdaq-listed securities only)	
				Q	Quotation only period for cross-SRO halt or pause	
				Т	Trading on Nasdaq	
Reason	19	4	Alphanumeric	Reflects the Market Ops or Market Watch code for the trading state change. Refer to Appendix C for current code list.		

Note: For Nasdaq-listed securities, Nasdaq conducts a cross when it releases an IPO security or when it re-opens a seasoned security after a trading halt or trading pause. To facilitate price transparency for its crosses, Nasdaq disseminates a Net Order Imbalance Indicator (NOII) message via the Nasdaq TotalView product suite at 5- second intervals during the quotation only period of the Trading Action release. The NOII data is especially valuable because it includes all order types (displayable and non- displayable) in its calculation.

2. 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 <u>SEC Release Number 34-61595</u>. In association with the Reg SHO rule change, Nasdaq introduced 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 recent Reg SHO Restriction status value.

REG SHO RESTRICTION						
Name	Offset	Len	Value	Notes		
Tracking Number	0	2	Integer	Nasdaq internal tracking number		
Timestamp	2	6	Timestamp	Time at which the Reg SHO Restriction message was generated		
Message Type	8	1	"γ"	Reg SHO Short Sale Price Test Restricted Indicator		
Stock	9	8	Alphanumeric	Stock symbol right padded with spaces.		

Reg SHO Action	17	1	Alphanumeric	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

3. Stock Directory

At the start of each trading day, Nasdaq disseminates stock directory messages for all active Nasdaq and non-Nasdaq-listed security symbols.

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.

Name	Offset	Length	Value	Notes
Tracking Number	0	2	Integer	Nasdaq internal tracking number
Timestamp	2	6	Integer	Time Stamp
Message Type	8	1	Alphanumeric	R = Stock Directory Message
Stock	9	8	Alphanumeric	Denotes the security symbol for the issue in the Nasdaq execution system.
Market	17	1	Alphanumeric	Indicates Listing market or listing market ti
Category				for the issue Definition
				Nasdaq-Listed Instruments
				Q Nasdaq Global Select
				Market SM
				G Nasdaq Global Market SM
				S Nasdaq Capital Market®
				Non-Nasdag-Listed Instruments
				N New York Stock
				Exchange (NYSE)
				A NYSE American
				P NYSE Arca
				Z BATS Z Exchange
				V Investors' Exchange, LLC
				<space> Not available</space>
Financial Status Indicato	18	1	Alphanumeric	For Nasdaq-listed issues, this field indicates when a firm is not in compliance with Nasdaq continued listing requirements.
r				Code Definition
				Nasdaq-Listed Instruments
				D Deficient
				E Delinquent
				Q Bankrupt
				S Suspended
				G Deficient and Bankrupt
				H Deficient and Delinquent
				J Delinquent and Bankrupt
				K Deficient, Delinquent
	1			and Bankrupt

				Rede for E Prod N Norr Is No Delin Non-Nasdaq-Listed <space> Not show</space>	emptions Suspended Exchange Traded duct mal (Default): Issuer OT Deficient, nquent, or Bankrupt d Instruments available. Firms uld refer to SIAC Is for code if needed.
Round Lot Size	19	4	Integer	Denotes the numb	
Round Lots Only	23	1	Alphanumeric	Indicates if Nasdaq for issue Code Defi Y Nasc acce orde N Nasc have rest secu	inition daq system limits order entry epts round lots ers for this security. daq system does not e any order size crictions for this urity. Odd and mixed orders are allowed.
Issue Classification	24	1	Alphanumeric		rity class for the issue as aq. See Appendix for
Issue Sub- Type	25	2	Alphanumeric		rity sub-type for the issue sdaq. See Appendix for
Authenticity	27	1	Alphanumeric	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. Code Definition P Live/Production T Test	
Short Sale Threshold Indicator	28	1	Alphanumeric	close-out of short 203(b)(3). Code Defin Y Issue Rule 2	rity is subject to mandatory sales under SEC Rule nition is restricted under SEC 203(b)(3) is not restricted

				<space></space>	Threshold Indicator not
				\Space>	available
IDO Flag	29	1	Alphanumoric	11' 1 'C	LL
IPO Flag	29	1	Alphanumeric	Indicates if the Nasdaq security is set u	
					. This field is intended to help
				-	rket participant firms comply
				with	
				FINRA Rule 5	
				Code	Definition
				Nasdaq-List	ted Instruments
				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
				Non-Nasda	q-Listed Instruments
				<space></space>	Not available
LULD	30	1	Alphanumeric	Indicates w	hich Limit Up / Limit Down
Reference				price band of	calculation parameter is to be
Price Tier				used for the	e instrument. Refer to LULD
				Rule for	
				details.	
				Code	Definition
				1	Tier 1 NMS Stocks and
					select ETPs
				2	Tier 2 NMS Stocks
				<space></space>	Not applicable
ETP Flag	31	1	Alphanumeric		nether the security is an
					aded product (ETP):
				Code	Definition
				Y	Instrument is an ETP
				N	Instrument is not an ETP
				<space></space>	Not available
ETP Factor	32	4	Integer	Tracks the ir	ntegral relationship of the ETP to
				the underly	ying index. Example: If the
				underlying	Index increases by a value of 1
				, ,	's Leverage factor is 3, indicates
					increase/decrease (see Inverse)
				by 3.	mercuse, accrease (see mverse)
				by 3.	
				Leverage Fa	ctor is rounded to the nearest
				integer bel	
				leverage factor 1 would represent leverage factors of 1 to	
					1 10
				1.99.	
				This field is u	used for LULD Tier I price band

		calculation purposes.

				ETP Leverage Factor currently not supported for Non-Nasdaq listed ETP's.	
Inverse	36	1	Alphanumeric	Indicates the directional relationship	
Indicato				between the ETP and underlying index.	
r				Code	Definition
				Υ	ETP is an Inverse ETP
				N	ETP is not an Inverse ETP
				Example: An	ETP Leverage Factor of 3 and an
				Inverse value of 'Y' indicates the ETP will	
				decrease by a value of 3.	
Bloomberg	37	12	Alphanumeric	The composite ID that Bloomberg has	
ID				assigned to the security. Please note that	
				Bloomberg ID will not be disseminated for	
				Nasdaq FilterView	

4. Adjusted Closing Price

At the start of each trading day, Nasdaq disseminates the adjusted closing price for all active symbols in the Nasdaq system.

For Nasdaq-listed securities the Nasdaq Official Closing Price will be used to calculate the adjusted close. For non-Nasdaq securities, the consolidated close will be used to calculate adjusted close.

Note: Nasdag will not support the adjusted closing price message format for NextShares.

ADJUSTED CLOSING PRICE								
Name	Offset	Len	Value	Notes				
Tracking Number	0	2	Integer	Nasdaq internal tracking number				
Timestamp	2	6	Timestamp	Time at which the Adjusted Closing Price message was generated				
Message Type	8	1	"G"	Adjusted Closing Price				
Stock	9	8	Alphanumeric	Stock symbol right padded with spaces.				
Security Class	17	1	Alphanumeric	Indicates the primary listing market for the issue. Allowable values are:				
				Code	Value			
				Q	Nasdaq			
				N	NYSE			
				А	NYSE American			
				Р	NYSE Arca			
				Z	BATS			
				V	Investors' Exchange, LLC			
Adjusted Closing Price	18	4	Price (4)	The previous trading day's official closing price adjusted for any applicable corporate actions. If there were no corporate actions for a security, the previous day's official close will be disseminated.				

5. Long Form Adjusted Closing Price

At the start of each trading day, Nasdaq disseminates the adjusted closing price for all active symbols in the Nasdaq system.

For Nasdaq-listed securities the Nasdaq Official Closing Price will be used to calculate the adjusted close. For non-Nasdaq securities, the consolidated close will be used to calculate adjusted close.

Note: Nasdag will not support the adjusted closing price message format for NextShares.

Please note this is only for securities that have exceeded the upper limit of a 4-byte price.

ADJUSTED CLOSING PRICE						
Name	Offset	Len	Value	Notes		
Tracking Number	0	2	Integer	Nasdaq internal tracking number		
Time Stamp	2	6	Integer	Time Stamp.		
Message Type	8	1	"g"	Adjusted Closi	ing Price	
Issue Symbol	9	8	Alphanumeric	Nasdaq-assigned indicator for issue for which the short sale restriction indicator message is being generated. For details on Nasdaq symbology, please refer to Appendix B.		
Security Class	17	1	Alphanumeric	Indicates the primary listing market for the issue. Allowable values are:		
				Code	Value	
				Q	Nasdaq	
				N	NYSE	
				A	NYSE American	
				Р	NYSE Arca	
				Z	BATS	
				V	Investors' Exchange, LLC	
Adjusted Closing Price	18	8	Price (4)	The previous trading day's official closing price adjusted for any applicable corporate actions. If there were no corporate actions for a security, the previous day's official close will be disseminated.		

6. Market-Wide Circuit Breaker (MWCB) Messaging

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	
Tracking Number	0	2	Integer	Nasdaq internal tracking number	
Timestamp	2	6	Timestamp	Time at which the MWCB Decline Level message was generated	
Message Type	8	1	"V"	Market wide circuit breaker Decline Level Message.	
Level 1	9	8	Price (8)	Denotes the MWCB Level 1 Value.	
Level 2	17	8	Price (8)	Denotes the MWCB Level 2 Value.	
Level 3	25	8	Price (8)	Denotes the MWCB Level 3 Value.	

2. MWCB Status Message

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

MWCB Breach	MWCB Breach Message					
Name	Offset	Length	Value	Notes		
Tracking Number	0	2	Integer	Nasdaq internal tracking number		
Timestamp	2	6	Timestamp	Time at which the MWCB Breaker Status message was generated		
Message Type	8	1	"W"	Market-Wide Circuit Breaker Status message		
Breached Level	9	1	Alphanumeric	Denotes the MWCB Level that was breached. "1" = Level 1 "2" = Level 2		
				"3" = Level 3		

8. IPO Quoting Period Update

Indicates the anticipated IPO quotation release time of a security.

IPO Quoting P	eriod Updat	е		
Name	Offset	Length	Value	Notes
Tracking Number	0	2	Integer	Nasdaq internal tracking number
Timestamp	2	6	Timestamp	Time at which the IPQ Quoting Period Update message was generated
Message Type	8	1	"K"	IPO Quoting Period Update Message
Stock	9	8	Alphanumeric	Denotes the security symbol for the issue in the Nasdaq execution system.
IPO Quotation Release Time	17	4	Integer	Denotes the IPO release time, in seconds since midnight, for quotation to the nearest second. Format: HHMMSS NOTE: If the quotation period is being canceled/postponed, we should state that 1. IPO Quotation Time will be set to 0 2. IPO Price will be set to 0

IPO	21	1	Alphanumeric	Code	Description
Quotation					

Release Qualifie r				С	Anticipated quotation release time This value would be used when Nasdaq Market Operations initially enters the IPO instrument for release. IPO release canceled/postponed This value would be used when Nasdaq Market Operations cancels or
					postpones the release of the IPO instrument.
IPO Price	22	4	Price (4)	Denotes the IPO price to be used for intraday net change calculations.	

1. Operational Halt

The Exchange uses this message to indicate the current Operational Status of a security to the trading community. An Operational Halt means that there has been an interruption of service on the identified security impacting only the designated Market Center. These Halts differ from the "Stock Trading Action" message types since an Operational Halt is specific to the exchange for which it is declared, and does not interrupt the ability of the trading community to trade the identified instrument on any other market place.

Nasdaq uses this administrative message to indicate the current trading status of the three market centers operated by Nasdaq.

Operational Ha	lt						
Name	Offset	Length	Value	Notes			
Tracking Number	0	2	Integer	Nasdaq internal tracking number			
Timestamp	2	6	Integer	Time at which the Operational Halt message was generated. Refer to Data Types for field processing notes.			
Message Type	8	1	"h"	Operational Ha	Operational Halt		
Stock	9	8	Alpha	Denotes the security symbol for the issue in Nasdaq execution system.			
Market Code	17	1	Alpha	Code	Value		
				Q	Nasdaq		
				В	BX		
				Χ	PSX		
Operational	18	1	Alpha	Code	Value		
Halt Action				Н	Operationally Halted on the identified Market		
				Т	Operational Halt has been lifted and Trading resumed		

2. Contact Information

Questions about the NLS entitlement, display guidelines may be directed to Nasdaq Global Information Services at Clientsuccess@nasdaq.com.

9. Appendix A – Last Sale Processing

SEC Vendor Display Rule

The Securities and Exchange Commission (SEC) has established certain display standards for market data vendors. For more information, please contact the <u>SEC</u> directly.

NLS carries only trade transactions from Nasdaq systems. Since NLS is <u>not</u> a consolidated trade data feed, it should not be used to feed market data displays that are subject to the SEC Vendor Display Rule.

Issue Statistic Calculations

NLS only provides raw trade data for the Nasdaq execution and TRF systems. If needed, firms should create their own algorithms for issue- and market center-level statistics. To help in the process, Nasdaq offers the following guidelines.

a) Last Sale and Volume Calculation

Within the market data industry, the term "last sale" has been widely used in conjunction with the SEC Vendor Display Rule. "Last Sale" is typically used to denote the most recent round or mixed lot trade transaction reported by a market center with an eligible sale condition code for the regular U.S. market session. For consolidated Nasdaq and TRF displays, firms should use the time stamp field from the Trade Report message to determine the proper trade sequence order for last sale calculations as well as time and sales displays.

To facilitate a "Last Sale" calculation, NLS includes the sale condition modifier for both Nasdaq execution system and TRF transactions. The Sale Condition Modifier field consists of four levels. A trade should only be applied to the high, low, last sale, and volume calculations if all four sales condition modifiers so allow.

Sale Condition – Level 1 denotes the settlement type of the transaction. If a transaction has a special settlement code, firms should not include transaction in high, low, or last sale price calculations. If the transaction has a regular settlement type, firms should process the next levels to determine proper processing.

Code	Value	High/Low	Last Sale	Volume
@	Regular Settlement	Yes, if other levels do not overrule	Yes, if other levels do not overrule	Yes, if other levels do not overrule
С	Cash Settlement	No	No	Yes
N	Next Day Settlemen t	No	No	Yes
R	Seller Settlement	No	No	Yes

Sale Condition – Level 2 indicates if a transaction was trade through exempt.

Code	Value	High/Low	Last Sale	Volume
F	Intermarket Sweep	Yes	Yes	Yes
0	Opening Print	Yes	Yes	Yes
4	Derivative Priced	Yes	No (except if first regular market trade of day)	Yes
5	Re-Opening Print	Yes	Yes	Yes
6	Closing Print	Yes	Yes	Yes
7	Qualified Contingent Trade (QCT)	No	No	Yes
<space></space>	Not applicable	See other levels	See other levels	See other levels

Sale Condition – Level 3 indicates if the transaction was reported during regular market hours with a "sold" code or during the extended trading hours session. For the TRF system, the "sold" code is used to indicate that a trade occurred during normal market hours but was reported more than 90 seconds after execution. Historically, only trades that occur during normal market hours and in proper sequence are included in the "last sale" calculation.

Code	Value	High/Low	Last Sale	Volume
Т	Extended Hours Trade	No	No	Yes
U	Extended Hours Trade – Reported Late or Out of Sequence	No	No	Yes
L	Sold Last – Reported Late But In Sequence	Yes	Yes	Yes
Z	Sold – Out of Sequence	Yes	No (except if first regular market trade of day)	Yes
<space></space>	Not applicable	See other levels	See other levels	See other levels

Sale Condition – Level 4 indicates special trading situations.

For the Nasdaq execution system, this sale condition level is used to denote when a trade record contains the Nasdaq Official Opening Price (NOOP) or Nasdaq Official

Closing Price (NOCP) values. Since Nasdaq also reports the underlying cross execution transaction to the tape, the NOOP and NOCP report volume should <u>not</u> be included in the daily volume calculation.

For the Cross Trade (X) modifiers, firms should defer to the Level 2 and Level 3 sale condition codes to determine whether to include the trade in the high, low, and last sale calculation statistics.

As outlined in the table below, Nasdaq also observes special processing rules for the Prior Reference Price (P), Weighted Average Price (W), and Odd Lot Execution (o) codes.

Code	Value	High/Low	Last Sale	Volume
А	Acquisition	Yes	Yes	Yes
В	Bunched	Yes	Yes	Yes
D	Distribution	Yes	Yes	Yes
Н	Price Variation Trade	No	No	Yes
М	Nasdaq Official Close Price (NOCP)	Yes for Nasdaq market center only or Nasdaq system-wide displays No for Nasdaq/ FINRA TRF only displays	Yes (for Nasdaq market center only or Nasdaq system-wide displays only)	No

0	Odd lot execution	No	No	Yes
P	Prior Reference Price	Yes	No (except if first regular market trade of day)	Yes
Q	Nasdaq Official Opening Price (NOOP)	Yes for Nasdaq market center only or Nasdaq system-wide displays No for Nasdaq/ FINRA TRF only displays	No	No
S	Split Trade	Yes	Yes	Yes

V	Contingent Trade	No	No	Yes
W	Average Price ³	No	No	Yes
X	Cross Trade	Yes (if sent with an eligible Level 2 modifier)	Yes (if sent with an eligible Level 2 modifier)	Yes
х	Odd Lot Cross Trade	No	No	Yes
<space></space>	Not applicable	See other levels	See other levels	See other levels

b) Last Trade Calculation

The term "Last Trade" is more widely applied within the market data industry. Many firms use the term "last trade" to refer to the most recent trade transaction reported in sequence. In addition to the "last sale" codes, many firms include odd lots and extended trading hour executions in the "last trade" price calculations.

c) Net Change Calculation

NLS does <u>not</u> include a net change indicator field. Data feed recipient must perform their own calculation for last sale eligible and last trade eligible transactions. The formula should be as follows:

Net Change for Issue Symbol = Current Trade Price - Adjusted Previous Close Price

To obtain the Adjusted Previous Close, firms will need to apply dividends to the previous day's closing price value. For Nasdaq-listed securities, firms may obtain dividend information via the Dividend Daily List web-based product. For ordering information, please refer to the <u>Daily List product page</u> on the Nasdaq Trader website..

For NYSE-, NYSE American-, NYSE Arca- and BATS-listed securities, firms should contact the listing exchange directly to inquire about corporate action data delivery options.

Dividend adjustments are typically applied to the closing price on the day prior to ex- date and reflected on the ex-date, the next business day. Cash dividends of 0.01

or greater should be subtracted from the closing price. For stock dividends, the closing price should be divided by the dividend amount.

³ For NLS processing, Nasdaq will use the sale condition modifier of "W" for all Average Price Trades regardless of the listing market center. While the UTP SIP uses the same sale condition modifier code for Nasdaq-listed issues, it should be noted that SIAC / CTA SIP uses a "B" sale condition modifier for Average Price Trades for NYSE-, NYSE American and NYSE Arca- listed securities.

10. Appendix B - Stock Symbol Convention

For Nasdaq-listed issues, Nasdaq 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 <u>Ticker Symbol Convention</u> page on the Nasdaq Trader website.

For NYSE-, NYSE American- and NYSE Arca-listed securities with subordinate issue types, please refer to <u>Ticker</u> <u>Symbol Convention</u> page on the Nasdaq Trader website.

11. 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, Nasdaqabides by any regulatorytradinghaltsand tradingpauses 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 Stock Trading Pause In Effect	
Т6	Regulatory Halt — Extraordinary Market Activity	
Т8	Halt ETF	
T12	Trading Halted; For Information Requested by Listing Market	
H4	Halt Non-Compliance	
Н9	Halt Filings Not Current	
H10	Halt SEC Trading Suspension	
H11	Halt Regulatory Concern	
01	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></space>	Reason Not Available	
REASON CODES FOR QUOTATION/TRADING RESUMPTION ACTIONS		
Code	Value	
Т3	News and Resumption Times	
Т7	Single Stock 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></space>	Reason Not Available	

For the current list of regulatory halts, please refer to the <u>Trading Halts page</u> on the Nasdaq Trader website.

12. Appendix D - Issue Classification Values

Identifies the security class for the issue as assigned by Nasdaq

CODES FOR ISSUE CLASSIFICATION VALUES	
Code	Value
Α	American Depositary Share
В	Bond
С	Common Stock
F	Depository Receipt
	144A
L	Limited Partnership
N	Notes
0	Ordinary Share
Р	Preferred Stock
Q	Other Securities
R	Right
S	Shares of Beneficial Interest
T	Convertible Debenture
U	Unit
V	Units/Benif Int
W	Warrant

13. Appendix E - Issue Sub-Type Values

CODES FOR ISSUE CLASSIFICATION VALUES		
Code	Value	
A	Preferred Trust Securities	
Al	Alpha Index ETNs	
В	Index Based Derivative	
C	Common Shares	
СВ	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 Depositary Shares	
E	ETF-Portfolio Depositary Receipt	
EG	Equity Gold Shares	
El	ETN-Equity Index-Linked Securities	
EM	NextShares*	
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	
0	Open Ended Mutual Fund	
Р	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	
Т	Tracking Stock	
TC	Trust Certificates	

TU	Trust Units
U	Portal
V	Contingent Value Right
W	Trust Issued Receipts
WC	World Currency Option
Χ	Trust
Υ	Other
Z	Not Applicable

^{*}Nasdaq is planning to introduce Exchange Traded Managed Funds (NextShares) in 2015. Next Shares prices will be stated in proxy price and NAV offset on this feed. Nasdaq is expected to issue vendor display requirements for this new asset class.

14. Appendix F – Documentation Version Control Log

NLS Version 1.00 February 22, 2007

NLS specification document released to public. For ordering information, please refer to <u>Nasdaq</u> <u>Vendor Alert #2007-011</u>.

NLS Version 1.00 April 30, 2007

The following sections of the NLS were updated for clarity reasons:

Section 5 – Data Type field was updated for all formats to delineate between alphabetic and alphanumeric fields.

Section 5.5.1 – Within the Stock Trading Action message, Nasdaq corrected the Data Type field to alphabetic for Current Trading Status field.

Section 5.5.2 – 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 <u>OR</u> if Nasdaq Operations adds a production issue to its online systems intra-day.

NLS Version 1.00 June 7, 2007

The following sections of the NLS were updated for clarity reasons:

Section 5.4 – Modified Trade Control message to add a Corrected Trade Control Number field to the message.

NLS Version 1.00 July 2, 2007

The following sections of the NLS were updated to reflect upcoming product changes:

Section 5.2 and Appendix A – Added new sale condition codes for Cross Trade transactions. For details on the new cross trade modifiers, please refer to <u>Nasdaq Vendor Alert #2007-047</u>.

NLS Version 1.00 August 22, 2007

The following sections of the NLS were updated to reflect upcoming product changes:

- Section 1.0 and Section 5 Updated references to the Trade Reporting Facility (TRF) to the fact the National Association of Securities Dealers (NASD) changed its name to Financial Industry Regulatory Authority (FINRA).
- Section 5.2 and Appendix A Added note to clearly state that the Nasdaq and TRF systems maintain separate time stamps.
- Appendix A Modified Level 4 sale condition matrix to clarify processing rules for Nasdaq Official Opening Price (NOOP) and Nasdaq Official Closing Price (NOCP) prints. Firms should include NOOP and NOCP values in Nasdaq market center system (Market Center = "Q" only) or Nasdaq system-wide (Market Centers = "Q" + "L") statistics. Firms should however, use the NOOP and NOCP values to set Nasdaq/FINRATRF system (Market Center = "L" only) statistics.

NLS Version 1.00 October 24, 2008

The NLS specification was updated to reflect the following documentation changes: Hyperlinks to Nasdaq Trader website pages were corrected and email addresses were updated.

NLS Version 1.00 October 30, 2008

The NLS specification was updated to reflect the following documentation changes:

Updated document to ensure that the value of "H" (Price Variation) properly reflected in references to the Level 4 Sale Condition Modifier.

NLS Version 1.00 December 4, 2009

The NLS specification was updated to reflect the following documentation changes:

Edited document to reflect that Sale Condition Level 2 now supports for Intermarket Sweep Order (ISO) values.

NLS Version 1.00 December 17, 2009

The NLS specification was updated to reflect the following documentation changes: Changed the Security Class

field values to differentiate between NYSE and NYSE MKT listed issues.

Changed the Sale Condition Modifier - Level 4 code for Odd Lot transactions to lower case "o".

Added Delivery Option sections to highlight FilterView options for Nasdag Last Sale (NLS).

NLS Version 1.00 January 7, 2010

The NLS specification was updated to reflect the following documentation changes:

the Security Class field values to differentiate between NYSE, NYSE MKT and Arca listed issues.

NLS Version 1.10 January 26, 2010

Released a new version of the NLS 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.
- Added note to Appendix B to reflect that Nasdaq is reviewing its stock symbol conventions to determine if changes are needed.

NLS Version 1.10 May 25, 2010

The NLS specification was updated to reflect the following documentation changes:

 Added two new Trading Action – Reason Code values (T5 and T7) in support of the Single Stock Trading Pause.

NLS Version 1.10 July 2, 2010

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

NLS Version 1.10 July 14, 2010

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

NLS Version 1.10 November 4, 2010

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

Nasdaq also fixed a documentation error related to the field layout for the the Stock Trading Action message. (Error was introduced in July of 2010.)

NLS Version 1.10 November 11, 2010

Nasdaq added a note to the sale condition matrixes about its standardization of the Average Price Trade code. As of November 2010, Nasdaq will use the "W" sale condition code for all exchange-listed issues.

NLS Version 1.10 April 6, 2011

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

NLS Version 1.10 September 20, 2011

Nasdag added two new values to the Financial Status Indicator. New values were N and S.

NLS Version 1.10 November 1, 2011

Nasdaq added a new Market Center code, "Z", for BATS-listed securities to the Market Category and Security Class fields.

NLS Version 1.10 November 6, 2012

Released a new version of the NLS 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
 - o 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.

NLS Version 1.10 January 9, 2013

Released a new version of the NLS 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.

NLS Version 1.10 February 22, 2013

Released a new version of the NLS documentation to correct offsets in the Stock Trading Action and Reg SHO Short Sale Price Test Restricted Indicator messages.

NLS Version 1.10 March 9, 2013

Released a new version of the NLS documentation to support the following changes:

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.

o LUDS - Volatility Trading Pause - Straddle Condition

NLS Version 1.10 April 12, 2013

The NLS specification was updated to reflect the following documentation changes: Changed all references from

NYSE Amex to NYSE MKT.

NLS Version 1.10 April 23, 2013

The NLS specification was updated to reflect the addition of the following

Event Codes in the System Event Message:

Start of System Hours: This message indicates that Nasdaq is open and ready to start accepting orders. End of System Hours: Indicates that Nasdaq is now closed and will not accept any new orders today.

NLS Version 1.20 May 29, 2013

The NLS specification was updated to reflect the addition of the Adjusted Closing Price Message.

NLS Version 2.00 July 10, 2013

The NLS Specification was updated to reflect the following changes:

Added Enhanced Symbol Directory

Added IPO Quotation Release Message

Added Market-Wide Circuit Breaker (MWCB) Messaging

- o MWCB Decline Level Message
- o 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 Addition of 'x' to Sale Condition - Level 4

NLS Version 2.00 August 2, 2013

The NLS Specification was updated to reflect the following changes:

Removed internal tracking number from multiple messages
Inclusion of the Appendices for Issue Classification and Issue Sub-Type
Updated offsets in the Symbol Directory Message
Updated offsets and lengths in the MWCB Decline Level Message
Changed the IPO Quotation Release Message Type to "K"
Updated offsets in the IPO Quotation Release Message

NLS Version 2.00 October 1, 2013

The NLS Specification was updated to reflect the following changes:

Conversion to a binary format

Clarified interpretation of the levels in the MWCB Decline Levels Message

NLS Version 2.00

August 28, 2014

The NLS Specification was updated to reflect the following changes:

Section 6.5.4- Corrected the language for the Adjusted Closing Price

NLS Version 2.00

December 5, 2014

The NLS Specification was updated to include missing Issue Sub-Type Codes (Appendix F):

AI – Alpha Indexes ETNs

CO - Collateralized Mortgage Obligation

EU - Equity Units

F - HOLDRS

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

NLS Version 2.1

March 27, 2015

The NLS Specification was updated to include the following:

Addition of the following messages:

- o NextShares Trade Report
- o Trade Cancel/Error for NextShares
- o Trade Correction for NextShares

Addition the Issue Sub-Type "EM" for Exchange Traded Managed Funds

Addition of the Level 1 Sale Condition "J " for Proxy Price Settlement

Clarification of Data Types

Increased timestamp length to reflect nanosecond granularity

These changes will take effect 10/1/2015. The 2.1 version will go live on

10/1/2015 - with v 2.0 running in parallel through 1/29/16.

Nasdaq and NFS are requesting that market data vendors display NextShares orders, quotations and trades in NAV-based format, if at all possible. For display use, Nasdaq is including the NAV premium / discount amount data points on QBBO, NLS and NLS Plus for these purposes. Firms may also calculate the NAV premium / discount amount from proxy price field by deducting \$100 from the disseminated value.

If firms decide to display NextShares data in proxy price format, Nasdaq and NFS are asking firms to add an indicator to the display so consumers to understand that this value is not the actual execution price for the trade/quote

NLS Version 2.1

June 30, 2015

The NLS Specification was updated to now exclude the initially planned Level 1 Sale Condition "J" for Proxy Price Settlement

http://www.Nasdagtrader.com/TraderNews.aspx?id=dtn2015-7

NLS Version 2.1

October 30, 2015

The NLS Specification was updated to reflect sale condition modifiers for Qualified Contingent Trades (QCT)

NLS Version 2.1

December 23, 2015

The NLS Specification was updated to reflect the following changes: Section 6.7 - Trade correction for NextShares - Corrected the field offsets

NLS Version 2.1

September 12, 2017

The NLS Specification was updated to reflect the following change:

- A new Market Category code in the Symbol Directory messages for the Investors' Exchange, LLC to distinguish IEX-listed issues. New market category code is "V".
- A new Security Class field in the following messages:
 - Stock Trading Action (Type H)
 - Trade Report Non-NextShares (Type T)
 - Trade Cancel/Error Non-NextShares (Type X)
 - Trade Correction Non-NextShares (Type C)
 - Adjusted Closing Price (Type G)

NLS Version 2.2

March 3, 2018

Released a new version of Nasdaq Last Sale documentation to add the new Operational Halt message (Section 6.8.7) to indicate the current Operational Status of a security to the trading community.

NLS Version 2.1

May 3, 2018

Nasdaq made the decision to fall back to the previous version number to avoid customer confusion related to different sequencing between the version number of the product specifications and the version number of the actual product code.

NLS Version 3.0

August 17, 2018

Nasdaq upgraded the software engine that creates the NLS Plus data stream to accommodate the introduction of the FINRA/Nasdaq TRF Chicago facility. The introduction of a new market center code of "2" to support TRF Chicago was also added to this specification. NLS Nasdaq Trades FilterView did not require an upgrade to support TRF Chicago, so the version number has not changed from 2.1.

NLS Version 3.0

May 17, 2021

Nasdaq enhanced message End of Day Trade Summary messages to now inlucde the Consolidated High Price, Consolidated Low Price, Consolidated Closing Price, and add Consolidated Open Price to the end of the message.

NLS Version 3.0

May 17, 2021

Nasdaq enhanced non-nextshares trades with Long form trades messages exceeding the upper limit 4-byte.

NLS Version 3.0

December 31, 2021

Nasdaq created separate and distinct specifications for both Nasdaq FilterView and Nasdaq TRF Filterview.

NLS Version 3.0

May 28, 2024

In accordance with recent SEC rule change, per the Equity Trader Alert, Nasdaq will no longer be disseminating Sale Condition code "N" Next Day Settlement on respective trade feeds.