

Nasdaq Computer To Computer Interface (CTCI)

Interface Specifications for Inbound Data Entry for the Nasdaq Fund
Network Data Service

NFN Version 2018-4

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1 OVERVIEW

1.1 Introduction

Operated by Nasdaq Information, LLC, the Nasdaq Fund Network facilitates the collection and dissemination of price and earnings information for U.S. investment companies. Specifically, Nasdaq disseminates the following data for NFN securities:

Instrument Type	NFN Message Formats		Key Fields
	Version 0040 ¹ No Longer Supported as of August 20, 2018	Version 0050	
Mutual Funds	MR	MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Reporting Type (0050 only) • Net Asset Value (NAV) • Offer / Market Price • Footnotes • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio • Capital Gains Distributions
Money Market Funds	No Longer Supported (as of July 8, 2016)	\$\$, DI, DS \$M)	Daily Valuation: <ul style="list-style-type: none"> • Reporting Type (0050 only) • Average Maturity • Average Life (0050 only) • NAV (0050 only) • NAV Calculation Time (0050 / \$M only) • Subsidized 7 Day Yield • Gross 7 Day Yield (0050 only) • Effective Annualized 7 Day Yield • Footnotes • Total Net Assets Distributions (0050 only): <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio • Capital Gains Distributions

¹ Nasdaq announced plans to discontinue NFN 0040 data formats in 2011. At clients' request, NFN continues to support 0040 formats "as is" for open-end mutual funds, closed-end mutual funds, UITs, and annuities only. In July 2016, Nasdaq ceased to support the 0040 Money Market Fund (\$R) message format as it is not compliant with the SEC Money Market Reform Act.

Subscriber Requirements for CTCI Communications

Instrument Type	NFN Message Formats		Key Fields
	Version 0040 ¹ No Longer Supported as of August 20, 2018	Version 0050	
Unit Investment Trusts (UITs)	UE (Equity), UD (Debt)	MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Redemption Price • Offer Price • Wrap Price • Current Yield • Estimated Long Term Return (ELTR) • Accrued Interest • Total Net Assets (0050 only) Distributions: <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio (0050 only) • Capital Gains Distributions
Annuities	MR	MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Net Asset Value (NAV) • Offer / Market Price • Footnotes • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio • Capital Gains Distributions
Structured Products		MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Net Asset Value (NAV) • Offer / Market Price • Footnotes • Current Yield • Estimated Long Term Return (ELTR) • Accrued Interest • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio • Capital Gains Distributions

Subscriber Requirements for CTCI Communications

Instrument Type	NFN Message Formats		Key Fields
	Version 0040 ¹ No Longer Supported as of August 20, 2018	Version 0050	
Alternative Investment Products (AIPs)		MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Net Asset Value (NAV) • Offer / Market Price • Footnotes • Current Yield • Estimated Long Term Return (ELTR) • Accrued Interest • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distributions • Stock Dividend Ratios • Capital Gains Distributions
NextShares Exchange Traded Managed Funds		MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Net Asset Value (NAV) • Market Price • Footnotes • Current Yield • Estimated Long Term Return (ELTR) • Accrued Interest • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distributions • Stock Dividend Ratios • Capital Gains Distributions
Collective Investment Trust (As of March 26, 2018)		MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Reporting Type (0050 only) • Net Asset Value (NAV) • Offer / Market Price • Footnotes • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio • Capital Gains Distributions

Subscriber Requirements for CTCI Communications

Instrument Type	NFN Message Formats		Key Fields
	Version 0040 ¹ No Longer Supported as of August 20, 2018	Version 0050	
Managed Funds (As of March 26, 2018)		MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Reporting Type (0050 only) • Net Asset Value (NAV) • Offer / Market Price • Footnotes • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio • Capital Gains Distributions
Separate Accounts (As of March 26, 2018)		MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Reporting Type (0050 only) • Net Asset Value (NAV) • Offer / Market Price • Footnotes • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio • Capital Gains Distributions
Hedge Fund (As of March 26, 2018)		MF, DI, DS	Daily Valuation: <ul style="list-style-type: none"> • Reporting Type (0050 only) • Net Asset Value (NAV) • Offer / Market Price • Footnotes • Total Net Assets Distributions: <ul style="list-style-type: none"> • Total Cash Distribution • Stock Dividend Ratio • Capital Gains Distributions
Demand Deposit Accounts (As of August 20, 2018)		MF	Daily Valuation: <ul style="list-style-type: none"> • Reporting Type (0050 only) • Net Asset Value (NAV) • Footnotes • Total Net Assets • Current Yield

Subscriber Requirements for CTCI Communications

This document specifies the formats to be used in a computer-to-computer interface (CTCI) for updating the data and receiving related acknowledgment messages from Nasdaq for the NFN.

1.2 Data Format Releases

1.2.1 Recent Release with Parallel Production Period

June 2011 - NFN 0050 Data Format Release

In June 2011, Nasdaq introduced a new version of the NFN data formats. The NFN 0050 messages were designed to:

- Streamline and expand the daily price reporting format for mutual funds, unit investment trusts, annuities and structured products
- Expand the daily price reporting format for money market funds to capture new data elements outlined in the SEC Money Market Reform Act.
- Separate and enhance the corporate action messages for dividends, interest payments and distributions.
- Expand Fund Identifier field size to support NFN symbology changes under discussion.

Subscriber Requirements for CTCI Communications

The data mapping for the NFN 0050 release was as follows:

	NFN 0040 Function Code Discontinued (as of August 20, 2018)	NFN 0050 Function Code
Daily Valuation Data		
Mutual Funds	MR	MF
Unit Investment Trust (UIT) – Debt	UD	MF
UIT – Equity	UE	MF
Money Market Fund	Discontinued (as of July 2016)	\$\$
Annuity	MR	MF
Corporate Actions		
Dividends / Interest – All Issues	Part of Valuation Message	DI
Other Distributions – All Issues	Part of Valuation Message	DS

Nasdaq implemented the NFN 0050 in parallel production mode on **Monday, June 13, 2011**. To facilitate the NFN data format release for customers, Nasdaq will support backward compatibility for the NFN 0040 data formats for mutual funds, UITs and annuities through September 30, 2017.

1.2.2 Upcoming Releases

New Instrument Codes – August 20, 2018

To enable issuers to better utilize the NFN / MFDS services Nasdaq will introduce new Instrument Type Code Value for Demand Deposit Accounts. Firms that wish to use the new instrument codes must use the NFN 0050 message formats for data entry.

Retirement of 0040 – August 20, 2018

Nasdaq will retire the 0040 message format for CTCI. This will be a hot cut, all messages must be sent in the 0050 format as of August 20, 2018.

1.2.3 Previous Release Summary

New Instrument Codes – March 26, 2018

To enable issuers to better utilize the NFN / MFDS services Nasdaq will introduce new Instrument Type Code Values for Collective Investment Trust (CITS), Managed Accounts, Separate Accounts, and Hedge Funds. Firms that wish to use the new instrument codes must use the NFN 0050 message formats for data entry.

1.2.4 Previous Release Summary

New Instrument Codes – June 5, 2017

Based on clients' requests, Nasdaq will add new Instrument Code values for Interval Fund and Business Development Company (BDC) on or about June 5, 2017. Firms that wish to use the new Instrument Codes must use NFN 0050 message formats for data entry. Please note that Interval Fund and BDC instruments will be classified as Mutual Fund instrument type for NFN 0050 reporting purposes.

Money Market Reform Changes – July 11, 2016

To facilitate the reporting of intraday NAVs under the SEC Money Market Reform Act, Nasdaq introduced a new Money Market Fund message format with calculation time on July 11, 2016. NFN pricing agents should use the new Money Market Fund (\$M) message format to specify the calculation time for a specific NAV record.

Nasdaq will continue to support the current 0050 money market fund (\$\$) message format as it supports intraday and floating NAVs. Because the inbound \$\$ message format does not include a timestamp, however, market data vendors show these money market fund records with the Nasdaq receipt time (rather than NFN pricing agent calculation time).

Because it is not compliant with the SEC Money Market Reform Act, Nasdaq ceased to support the 0040 money market fund (\$R) message format as of close of business on July 8, 2016.

NextShares Exchanged Traded Managed Funds – September 2015 / February 2016

Nasdaq introduced NextShares as a new exchange-listed and exchange-traded asset class in February 2016. For more information, visit the NextShares website at <http://www.nextshares.com>.

The NFN system is used to report daily net asset value (NAV) for NextShares. NFN NAV data is used by trade confirmation systems so that fund accountants input the NAV entries (and NAV corrections) in a timely and consistent manner. To report NextShares, fund accountants must use the NFN 0050 inbound message formats with a new Instrument Type code of "EM". Please note that NextShares NAV reporting deadline is 6:45 p.m., Eastern Time (ET).² Please also note that, because NextShares are exchange listed instruments, corporate actions need to be coordinated with [Nasdaq Market Operations](#).

To prevent symbol conflicts with other asset classes, NFN Operations will assign seven character tickers for NextShares valuation report purposes. The NFN symbol will be comprised of the listing exchange ticker symbol followed by "NX". If, for example, the NextShares had an exchange listing ticker of "ETMFC", the NFN symbol for NAV reporting would be "ETMFCNX".

Please note that Nasdaq released the NFN system changes for NextShares on September 14, 2015. As part of this release, Nasdaq changed the NFN system open time to at 8:00 a.m., ET.

² To ensure that UTP and other market participant firms have adequate time to complete the nightly trade adjustment process prior to system close, the NAV reporting deadline for NextShares is 6:45 p.m., ET. In the event that a NFN pricing agent misses the NextShares NAV reporting deadline or needs to correct NAV data on a T+1 to T+3 basis, it must contact [Nasdaq Trading Services](#) / Trade Support Desk.

Subscriber Requirements for CTCI Communications

New Footnote Codes – 1st Quarter 2015

Nasdaq introduced new Footnote codes to the NFN system on April 13, 2015. In association with the amended SEC Money Market Reform Act, Nasdaq added the following two new footnote codes to the NFN 0050 inbound message formats:

Footnote Code	Definition	Purpose
G	Redemption Gate	<p>Denotes if a money market fund has temporarily suspended shareholder redemptions.</p> <p>Under the amended SEC Money Market Reform Act, the SEC allows the board of directors of a non-governmental money market fund to temporarily suspend shareholder redemptions for up to 10 business days in a 90 day period (“redemption gate”) if the level of the fund’s weekly liquid assets falls below 30% of the fund’s total assets.</p> <p>Government money market funds are permitted, but not required, to impose liquidity fees and redemption gates.</p> <p>For more information on the SEC Money Market Reform Act amendments, please refer to the SEC website at http://www.sec.gov/rules/final/2014/33-9616.pdf.</p>
L	Liquidity Fee	<p>Denotes if a money market fund is imposing a liquidity fee.</p> <p>Under the amended SEC Money Market Reform Act, the SEC allows the board of directors of a non-government money market fund to impose a liquidity fee of up to 2% if the level of the fund’s “weekly liquid assets” falls below 30% of the fund’s total assets.</p> <p>The rule also requires non-government money market funds to impose a 1% liquidity fee if the fund’s level of weekly liquid assets falls below 10% of total assets, unless the fund’s board of directors determines that it would not be in the fund’s best interest to impose the fee or determines to impose a lower or higher (up to 2%) liquidity fee.</p> <p>Government money market funds are permitted, but not required, to impose liquidity fees and redemption gates.</p> <p>For more information on the SEC Money Market Reform Act amendments, please refer to the SEC website at http://www.sec.gov/rules/final/2014/33-9616.pdf.</p>

Based on customer input, Nasdaq also added the following new footnote code for interval price mutual fund instruments to the NFN 0050 message formats:

Footnote Code	Definition	Purpose
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Subscriber Requirements for CTCI Communications

I	Repurchase Offer Period	Denotes that a repurchase offer period is in effect for an interval fund. An interval fund is a type of investment company that periodically offers to repurchase its shares from shareholders. That is, the fund periodically offers to buy back a stated portion of its shares from shareholders. Shareholders are not required to accept these offers and sell their shares back to the fund. During repurchase offer periods, interval funds have an increased frequency of NFN price reporting.
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For release details, please refer to [NFN News #2014-7](#).

August 2014 – Test Symbol Release

In response to NFN pricing agent requests, Nasdaq modified how test symbols were assigned and supported for mutual funds, money market funds, UITs, annuities, AIPs and structured products on August 11, 2014. To make it easier for firms to validate test records, Nasdaq started to support test symbols in all NFN reports as well as the outbound Mutual Fund Dissemination Service (MFDS) data feed. Nasdaq also standardized field names across NFN interfaces and specification documents.

September 2013 – Dividend Enhancement Release

In response to NFN pricing agent requests, Nasdaq implemented the following enhancements to Dividend reporting on September 9, 2013:

- **Daily Dividend Factor:** To support greater reporting granularity up to 6 decimal for the Daily Dividend field within the NFN 0050 valuation messages, Nasdaq changed the inbound and outbound price format from \$\$\$\$d to \$\$\$\$\$.
- **Cash Distribution Type:** To support end-of-year reporting, Nasdaq added a new code for Special Cash Dividends within the NFN 0050 Dividend / Interest message. The new “S” code will be introduced as an optional value for NFN 0050 data entry. To allow firms to report Cash Dividends and Special Cash Dividends with the same Ex-Date, Nasdaq will also modify the validation logic to use the combination of Symbol, Cash Distribution Type and Ex-Date for Action processing.

March 2013 – Nasdaq supports Alternative Investment Products (AIPs) via the NFN system as of March 11, 2013. To support this new asset class, Nasdaq added a new Fund Type value of “AP” to the NFN 0050 message formats MF, DI and DS.

Within the MF valuation message format, AIPs are required populate the NAV and Offer Price fields. For AIP only, Nasdaq supports a new Footnote code value of “C” to be used for revaluation of assets.

Due to the limited version life, Nasdaq will not support AIPs via the legacy NFN 0040 formats.

Subscriber Requirements for CTCI Communications

June 2011 – As part of its NFN release strategy, Nasdaq’s policy is to support backward compatibility for only one prior version of NFN message formats. As a result, Nasdaq ceased to support for the NFN 0030 message formats on June 10, 2011.

March 2009 – NFN Release 0040 was implemented on March 2, 2009. In NFN Release 0040, Nasdaq offered the following new features:

- NFN Valuation - Mutual Funds: Nasdaq modified the “MR” message format to support the reporting of Assets. To minimize the impact to customers, Nasdaq reused reserve bytes in the “MR” message format.
- NFN Valuation - Money Market Funds: Nasdaq replaced the Money Market Fund message format with a new standardized format that can be used to report current day and prior day values. The new Money Market Fund Release closely resembled the Money Market Extended Release data format in version 0030 except that it featured an Entry Date field.

In addition to these format changes, Nasdaq made some back office changes on its side to support daily price reporting from annuities and structured products via the NFN system.

June 2002 – As part of the NFN 0030 release, NASDAQ implemented content changes to existing Mutual Fund Update message as well as added new message types for UIT Equity & UIT Debt instruments. The overall format of the CTCI specification document was revised as well. (Note: NFN subsequently retired the NFN 0030 message formats on June 10, 2011.)

October 2, 2000 – The TCP/IP Communications Protocol was added to Section 2. Various content and cosmetic changes, which require no new programming, were also made.

1.3 Documentation Scope

Nasdaq provides a Computer-to-Computer Interface (CTCI) facility that allows subscribers to report price data for NASDAQ, OTC Bulletin Board (OTCBB), and Mutual Fund Quotation Service (NFN) securities. **This document describes CTCI message formats for use for the NFN product only.**

2 Communications Protocols

Computerized firms that elect to use the CTCI will conform to the TCP/IP protocol detailed in Appendix A.

The subscriber is responsible for all line and equipment costs required for the use of the CTCI. In the TCP/IP environment, the system will support bandwidth from 56 kbps up to full T1 rates. A subscriber may order a redundant line(s) for backup.

CTCI permits a firm acting as a Service Bureau to interface with Nasdaq applications on behalf of multiple firms. Two station configuration methods for this Service Bureau capability are available:

1. One or more stations can be defined for each Service Bureau client. Since each client station will be configured and used just as if they were a direct link to the actual client, no Service Bureau-specific message formatting rules contained herein apply to this type of configuration.
2. Multiple clients can be associated to one or more Service Bureau stations. Since the Service Bureau station will be configured and used on behalf of multiple clients, all Service Bureau-specific message formatting rules contained herein apply to this type of configuration.

3 STANDARD INPUT MESSAGE FORMATS

The Nasdaq Message Switch supports three types of input messages:

- **Application** – Application messages carry application-specific data in the message body to the Nasdaq application system designated in the message header. For example, a Mutual Fund Regular Release Update message is an application message.
- **ADMIN** – ADMIN messages are text messages sent to and logged in the Switch as communication checks.
- **SUPER** – SUPER messages are used to communicate with the NASDAQ Message Switch itself. These messages are used to notify the switch of the status of the user station, to turn sequence number checking on or off, to reset the sequence numbers, and to initiate retransmission of missed or lost CTCI output messages.

3.1 General Message Format

Input messages consist of:

- a message header that defines the message origin, category, and destination;
- a message body that consists of one or more lines of text; and
- an optional message trailer that consists of one line of text carrying the message sequence number.

Message headers, body, and trailers are constructed from lines of text. Each line consists of one or more data fields. *All lines except the last line must be terminated with an end-of-line delimiter*, which is either a Carriage Return/Line Feed pair <CR/LF> or a single Line Feed <LF> (for the sake of uniformity only the <CR/LF> pair will be used throughout this document to represent the end-of-line delimiter). Some of the data fields may be optional depending on the message category or destination. When an optional field is omitted and the result is a blank line the required end-of-line delimiter must still be provided.

Messages delivered to the Nasdaq Message Switch via TCP/IP are enclosed within a message envelope consisting of a 13-byte header and a 2-byte sentinel (“UU”). These 15 bytes are in addition to the header, body, and trailer described here. Transmission of blocked messages is not permitted, that is, each 15 byte “message envelope” must contain only one message, regardless of the message destination. Please see Appendix A: TCP/IP Connection for more details.

3.1.1 Message Header Format

Line 0: [Origin] <CR/LF>
Line 1: [Data] <CR/LF>
Line 1A: [Category] **space** [Destination] <CR/LF>
Blank Line: <CR/LF>

The header consists of four lines. The first line is line 0 and contains the origin of the message. The second line is line 1 and contains the data. The third line is line 1a and contains the category and destination of the message. The fourth line is always a blank line.

3.1.2 Message Body Format

- Line 2: [first line of message body] <CR/LF>
- Line 3: [possible 2nd line] <CR/LF>
- Line n: [possible additional lines] <CR/LF>

The body consists of one or more lines. The first line is always line 2. For application messages, the content of the message body varies according to the destination application and the function being specified. For ADMIN messages, the body consists of one or more lines of user-defined text. For SUPER messages, the body consists of one or more lines of Switch-defined text.

3.1.3 Message Trailer Format

Trailer 1: [trailer data]

The trailer consists of a single line carrying the message sequence number. If the user elects to provide message sequence numbers for validation by the Switch, the message trailer line is required for all input messages. If the user elects not to provide message sequence numbers for validation by the Switch, the message trailer line can be omitted from ADMIN and application input messages. It cannot be omitted for SUPER messages.

The message trailer is the last line of a message and is, therefore, never terminated with a <CR/LF>.

The NASDAQ Switch supports four input message trailer formats:

Format Description Examples

Format	Description	Examples
Format 1	A fixed 4-digit, zero-filled sequence number.	0034
Format 2	A hyphen (-), followed by a 1-4 digit sequence number.	-34
Format 3	The letters "OL" followed by an optional third alphabetic character and/or a space followed by a 1-4 digit sequence number. The sequence number can be zero-filled if desired. This sequence can appear anywhere on the last line. A space is used to separate the sequence number from any following user-defined data.	OL34 OLX 0034 [user-defined data]OLX 0034[spaceuser-defined data]
Format 4	A 1-4 digit sequence number at the beginning of the line, followed by a space and a user-defined character string starting with a <i>non-numeric</i> character. The sequence number can be zero filled if desired.	34spaceAXD 0034space/200008041717

If a user elects to provide message sequence numbers for validation by the Switch, the following should be kept in mind:

1. The allowed range for sequence numbers is 0001 to 9999.
2. Once 9999 is reached, the number rolls over to 0001 (not 0000), and any currently outstanding gaps for the station will be erased.
3. Each station requires its own unique sequence number series.

Subscriber Requirements for CTCI Communications

For example:

1. The first message from Station 1 will be number 0001.
2. The second message from Station 1 will be number 0002.
3. If the next message is from Station 2, it will be number 0001, starting a new series specifically for Station 2.
4. The Switch will issue a NUMBER GAP message to any station where a gap in the provided message sequence numbers has been detected. The user is strongly urged to fill any gap (by retransmitting the missed message including the original i.e., missing, sequence number) as soon as possible, as the Switch allows only 16 outstanding gaps per station.
5. The sequence number in the required trailer of SUPER messages can have any value because this message type is never used to detect or fill a gap.
6. The station input sequence number, maintained by the Switch:
 - o has value of the next expected sequence number from the user without exception;
 - o has a start-of-day value of 0001;
 - o can be altered programmatically with SUPER messages;
 - o can be altered manually by Nasdaq Tandem Operations staff;
 - o all input messages, including SUPER messages, "consume" a station input sequence number. For example, if two non-SUPER messages are sent with the legitimate sequence numbers 0041 and 0042, then two SYSTEM CHECK (SUPER) messages are sent with sequence number
 - o values of 0001 and 0100, and then another non-SUPER message is sent, then the SUPER message sequence numbers will not be flagged as out of the ordinary in any way. The non-SUPER message sent must contain the input sequence number 0045 because the two SUPER messages "consumed" the input sequence numbers 0043 and 0044.
7. The subscriber may retransmit a SUPER message, but the message will not fill a gap reported by any NUMBER GAP message. A self-addressed ADMIN message should be sent to fill a gap caused by a missed SUPER message.
8. A SUPER message should never be the first message sent to a station when a session is restored after a communication outage. If messages were in-flight when the session was lost, any SUPER message sent to stations as the first message following session reestablishment will adversely affect input gap detection, and one or more missing messages from the previous session will not be reported with a NUMBER GAP message. It is recommended that a self-addressed ADMIN message be the first message sent to stations when a session is re-established.

3.2 Application Messages

Application messages carry application-specific data in the message body to the Nasdaq application system designated in the message header. Please see section 4 for the NFN application message formats.

3.3 Admin Messages

Input Admin messages should be used in the following recovery situations.

- o A self-addressed ADMIN message should be sent in place of a SUPER message when the Switch sends the user a NUMBER GAP message and the gap corresponds to a missed SUPER message; the sequence number of the missing SUPER message must be used by this ADMIN message in order to remove the gap created by the missed SUPER message. If necessary, the SUPER message can be resent after the gap has been filled by the ADMIN message.
- o When a session is restored after a communications problem, an ADMIN message should be the first message sent to a station, so that the input gap detection by the Switch is accurate. An application message may also be used for this purpose.

Subscriber Requirements for CTCI Communications

When an ADMIN message is used as described above, it is recommended that the destination field on Line 1A be populated with a value that will cause the message to be routed back to the originator; the user can obtain the “address” for this specific purpose from the output message trailer <DestId> field, described in section 3.1.3.

Such a self-addressed message not only handles the situations described above, but also proves to the user that data can flow in both directions.

3.3.1 Message Header Format

Input Admin Message Header Format

Line 0: <Originator><CR/LF>

Line 1: <CR/LF>

Line 1A: <Category>space<Destination><CR/LF>

Blank Line: <CR/LF>

Line	Field	Description	Req'd
0	Entry Originator	1 to 6 characters The Nasdaq Switch will populate the field if it is not supplied.	N for firms not acting as a service bureau
	<CR/LF>	line delimiter	Y even if the Entry Originator field is not entered
1	Variable Data	0 to 253 characters Field that the CTCI subscriber may use to enter any data.	N
	<CR/LF>	line delimiter	Y
1a	Category	“ADMIN” Identifies the message category. This field must contain the string “ADMIN”.	Y
	space	field separator	Y
	Destination	1 to 6 character address code Holds the address of the message destination. It is recommended that this field be populated with an address that will route it back to the originator (a “self addressed” message). The Nasdaq Customer Subscriber Test group (CST) can provide the user with the appropriate destination code for use in sending themselves self-addressed Admin messages.	Y
	<CR/LF>	line delimiter	Y
Blank	<CR/LF>	Blank line used to separate the message header from the message body.	Y

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3.3.2 Message Body Format

Input Admin Message Body Format

Line 2: [Variable Data] <CR/LF>

Line 3 ...: [Additional Data] <CR/LF>

Line	Field	Description	Req'd
2	Variable Data	Free form text. of an Admin Message. This is a free format message containing information destined for the individual address identified in the Destination field of the message header.	Y
	<CR/LF>	line delimiter	Y
3	Additional Data	Free form additional lines of message text. Each line requires a <CR/LF> to separate it from the following line.	N

Subscriber Requirements for CTCI Communications

3.3.3 Message Trailer Format

Trailer 1: [trailer data]

The Nasdaq Switch supports four input message trailer formats:

Format	Description	Examples
Format 1	A fixed 4-digit, zero-filled sequence number.	0034
Format 2	A hyphen (-), followed by a 1-4 digit sequence number.	-34
Format 3	The letters "OL" followed by an optional third alphabetic character and/or a space followed by a 1-4 digit sequence number. The sequence number can be zero-filled if desired. This sequence can appear anywhere on the last line. A space is used to separate the sequence number from any following user-defined data.	OL34 OLX 0034 [user-defined data]OLX 0034[spaceuser-defined data]
Format 4	A 1-4 digit sequence number at the beginning of the line, followed by a space and a user-defined character string starting with a <i>non-numeric</i> character. The sequence number can be zero filled if desired.	34spaceAXD 0034space/200008041717

3.4 SUPER Messages

Input SUPER messages are used to communicate with the Nasdaq Message Switch. These messages are used to notify the switch of the status of the user station, to turn sequence number checking on or off, to reset the sequence numbers, and to initiate retransmission of missed or lost CTCI output messages.

Message Header Format

Line 0: [Entry Originator] <CR/LF>

Line 1: [Variable Data] <CR/LF>

Line 1A: [Category] <CR/LF>

Blank Line: <CR/LF>

Line	Field	Description	Req'd
0	Entry Originator	1 to 6 characters For service bureaus, the field must contain the 4-character MMID (as specified by the Nasdaq) of the firm represented by the transaction. The Nasdaq Switch will populate the field if it is not supplied.	Y for firms acting as a service bureau N for firms not acting as a service bureau
	<CR/LF>	line delimiter	Y even if the Entry Originator field is not entered
1	Variable Data	0-253 characters Field which the CTCI subscriber may use to enter any data.	N
	<CR/LF>	line delimiter	Y

Subscriber Requirements for CTCI Communications

Line	Field	Description	Req'd
1a	Category	"SUPER" Identifies the message category. This field must contain the string "SUPER". SUPER messages do not have a destination field.	Y
	<CR/LF>	line delimiter	Y
Blank	<CR/LF>	blank line used to separate the message header from the message body.	Y

3.4.1 Message Body Format

In order to be processed automatically by the Switch, the message body portion of a SUPER Message must match one of the expected SUPER message formats. If the text does not conform to one of the specified formats, the message will be rejected.

Line 2: **[Function Text]**

Line 3-n: **[Additional Lines of Text as required]**

Line	Field	Description	Req'd
2	Function Text	See the following table for the supported SUPER message functions. In some cases, the Function Text may consist of multiple lines, with a <CR/LF> between each one. The last line does not require a <CR/LF> as a terminator.	Y

SUPER Message Functions

Subscriber Requirements for CTCI Communications

SUPER Function Text	Processing
GOOD MORNING	Indicates the subscriber is ready to begin receiving messages from the Switch.
GOOD NIGHT	Indicates the subscriber has no further traffic to send and is no longer prepared to receive traffic. This command will cause the station output queue to be drained.
SUSPEND SEQ CHECK	Instructs the Switch to suspend input sequence number checking for this subscriber station. This command is only valid if sequence checking was previously instituted.
ALLOW SEQ CHECK	Instructs the Switch to resume input sequence number checking from the next received input sequence number. This command is only valid if suspension of sequence checking was previously instituted.
SYSTEM CHECK	A test message allowing a subscriber to check its ability to communicate with the Switch.
RESET ORDER SEQ<CR/LF> nnnn or RESET ORDER SEQ<CR/LF> ANY	Instructs the Switch to expect a new input sequence number. Two options are provided: nnnn - Numeric string specifying the sequence number provided with the next input message. ANY - Literal indicating that sequence number checking is to commence from the sequence number of the next input message. Either form of this message will erase all previously created number gaps.
REVERT TO SEQ 1	Instructs the Switch to reset to start-of-day numbering in both directions (input and output). This message will erase all previously created number gaps.
RESTART LAST RCVD<CR/LF> Nnnn	Instructs the Switch that a subscriber switching facility has been restored after a failure. The Switch will reset the next output sequence number to nnnn + 1, where nnnn is typically the last message sequence number that had been received by the subscriber.

Subscriber Requirements for CTCI Communications

<p>RTVL LAST OUT [mm] or RTVL OUT nnnnn mm Other options: ROUTE=[ADDR] ID=[SID]</p>	<p>Permits a subscriber to request a resend of messages previously transmitted by the Switch. The optional field mm is the number of messages to be retrieved and must be between 1 and 15 (default is 1). If more than 15 messages are requested then multiple SUPER messages must be used.</p> <p>LAST OUT mm instructs the Switch to resend the most recent mm messages.</p> <p>OUT nnnnn mm instructs the Switch to resend mm messages starting with the message which had output retrieval number nnnnn.</p> <p>Valid values for nnnnn are 1 through 65535.</p> <p>Retrieval of INPUT messages is no longer supported.</p> <p>If the "ROUTE=" option is used, the retrieved messages will be sent to <ADDR>.</p> <p>If the "ID=" option is used, the retrieved messages will be messages belonging to the station defined by <SID>.</p> <p>A station may only use the ROUTE= and ID= options if it has been granted those privileges.</p> <p>NOTE: The previous specification showed <CR/LF> after the RTVL. This is still a valid input format. However, the response to this command echoes this information as a single line, i.e., no <CR/LF> after RTVL. While both formats are acceptable, we choose to represent it in this spec with a single line in an attempt to avoid confusion.</p>
<p>NUMBER GAP nnnnn or NUMBER GAP nnnnn nnnnn Other options: ROUTE=[ADDR] ID=[SID]</p>	<p>As input to the Switch:</p> <p>Indicates that a subscriber has detected a gap in the Switch assigned output sequence number and is requesting the resend of the message originally sent with retrieval number nnnnn. The Switch will resend the related message with a new output sequence number; the optional second trailer line in the output message will indicate the retrieval number previously assigned to the message i.e., nnnnn.</p> <p>Up to two messages can be retrieved by a single NUMBER GAP message (nnnnn nnnnn denotes 2 distinct retrieval numbers, not a range).</p> <p>Valid values for nnnnn are 1 through 65535 only.</p> <p>See the discussion of the RTVL command for info about the optional ROUTE= and ID= fields.</p> <p>NOTE: The previous specification showed <CR/LF> after the NUMBER GAP. This is still a valid input format. However, the response to this command echoes this information as a single line, i.e., no <CR/LF> after NUMBER GAP. While both formats are acceptable, we choose to represent it in this spec with a single line in an attempt to avoid confusion.</p>

Because the station output queue is a first-in-first-out (FIFO) queue, the subscriber CTCI design must take into account the fact that SUPER message rejects and acknowledgements are always appended to the existing (and potentially deep) queue. There is currently no way to push output messages onto the top of an output queue.

3.4.2 Message Trailer Format

Trailer 1: [trailer data]

The Nasdaq Switch supports four input message trailer formats:

Format	Description	Examples
Format 1	A fixed 4-digit, zero-filled sequence number.	0034
Format 2	A hyphen (-), followed by a 1-4 digit sequence number.	-34
Format 3	The letters "OL" followed by an optional third alphabetic character and/or a space followed by a 1-4 digit sequence number. The sequence number can be zero-filled if desired. This sequence can appear anywhere on the last line. A space is used to separate the sequence number from any following user-defined data.	OL34 OLX 0034 [user-defined data]OLX 0034[spaceuser-defined data]
Format 4	A 1-4 digit sequence number at the beginning of the line, followed by a space and a user-defined character string starting with a <i>non-numeric</i> character. The sequence number can be zero filled if desired.	34spaceAXD 0034space/200008041717

4 STANDARD OUTPUT MESSAGE FORMATS

4.1 General Message Format

Output messages consist of:

- o a message header that defines the start of the message, its origin, its destination, its output sequence number, and the message type;
- o a message body that consists of one or more lines of text; and
- o an optional message trailer that carries the date and time, the message retrieval number, and other information.

Messages sent from the Nasdaq Message Switch via TCP/IP are enclosed within a message envelope consisting of a 13-byte header and a 2-byte sentinel (“UU”). These 15 bytes are in addition to the header, body, and trailer described here. Please see Appendix A for more details.

Message headers and trailers are constructed from lines of text. Each line consists of one or more data fields and is terminated by a Carriage Return/Line Feed pair <CR/LF>.

An output message header consists of up to 4 fields with a user defined field separator between each field. The separator defaults to space if the user has not specified something else. The user can select which fields they would like to receive and can specify the order in which the fields should be placed in the header.

Assuming that the user has elected to receive all fields in the default order, the format is as follows:

4.1.1 Message Header Format

The message header format is one line containing four fields. The field separators can, however, be <CR/LF>, which makes the message header four lines.

Line 1: [Destination Code] [field separator]
 [Originator Code] [field separator]
 [Sequence Number] [field separator]
 [Message Type] <CR/LF>

Line	Field	Description
1	Destination Code	The Destination Code is a 1-6 character identifier that defaults to the Station ID of the user. The user may specify a custom code. Custom codes may also be specified for each message. See field 4. The user may elect not to receive this field.
	Field Separator	The field separator is defined by the user (space , <CR/LF>, <LF>, etc.). If the user does not specify a separator, a space is used by default.
	Originator Code	The Originator Code is a 1-6 character identifier that defaults to the Station ID of the originator of the message. The user may specify custom Originator Codes for each message type. See field 4. The user may elect not to receive this field.
	Field Separator	The field separator is defined by the user (space , <CR/LF>, <LF>, etc.). If the user does not specify a separator, a space is used by default.

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Line	Field	Description
	Sequence Number	4 numeric characters. Output message sequence number. The number is in the range 0001 to 9999. When 9999 is reached, the number wraps to 0001 (0000 is not used). The "REVERT TO SEQ 1" Super Message resets this field. The user may elect not to receive this field.
	Field Separator	The user defines the field separator (space , <CR/LF> , <LF> , etc.). If the user does not specify a separator, a space is used by default.
	Message Type	The message type is a 1-character code that specifies the nature of the message. The user may select the user's own codes. If custom codes are not used, the defaults are as follows: R = Report A = Admin S = Status P = Super T = Other The type of an application output message is determined by the Category Field of Input Header Line 1A of the message input to the switch by the application. It does not indicate which application produced the message. Standard Input information is in section three of this document. The user may elect not to receive this field.
	<CR/LF>	Line delimiter. A <CR/LF> is used to separate the output message header from the message body. It is present even if the user elects not to receive any of the fields defined above.

As part of Nasdaq's on-going effort to maximize Switch performance and capacity, Nasdaq will require that the last three characters of the six-character Common Message Switch (CMS) output header Originator Code be reserved for Nasdaq's use. If you, therefore, plan to code your firm's internal systems to use the Originator Code to identify system of origin, you should compare the first three characters of the Originator Code.

The three-letter codes that should be used to identify the system of origin for the Nasdaq Market Center is "HSW". NFN uses the same code as the Nasdaq Market Center (HSW).

Nasdaq reserves the right to change an application mnemonic at any time.

4.1.2 Message Body Format

An output message body consists of one or more lines, with the first line referred to as Line 1. The number of lines and their content varies with the class of the message.

Line 1: [first line of message body] **<CR/LF>**

Line 2: [possible 2nd line] **<CR/LF>**

Line n: [possible additional lines] **<CR/LF>**

4.1.3 Message Trailer Format

An output message trailer consists of either one or two lines depending upon the type of message. Each line in the trailer is optional and the user may elect to not receive either one. If present, the format is as follows:

Trailer 1: [Date/Time]space[Dest ID]slash[Rtvl #]<CR/LF>

Trailer 2: [Resend]space[Alt Route]space[Poss Dup]

Line	Field	Description
Trailer 1	Date/Time	12 character numeric field. The format of the Date/Time field is HHMMSSDDMMYY (hours, minutes, seconds, day, month, year).
	space	Field separator.
	DestID	1-6 character Destination Station ID. This is identical to the default Destination Code found in the output message header. It is not affected if the user chooses to have a custom Destination Code.
	slash	Field separator (/).
	Rtvl #	4 or 6 character numeric field. The switch maintains a 6-digit retrieval number (RN) from 000001 to 065535. When 065535 is reached, the number wraps to 000001. A user will receive the default 4-digit RN or can choose to receive the 6-digit RN (recommended). The 4-digit RN is merely the rightmost 4 digits of the number maintained by the switch. The 4-digit wrapping sequence is [00]0001 to [00]9999, [01]0000 to [01]9999, [02]..., [06]0000 to [06]5535, [00]0001 to [00]9999 and so on.
	<CR/LF>	Line delimiter. The <CR/LF> is only present if the trailer includes Trailer Line 2.
Trailer 2*	Resend	An optional “ RSND ” followed by [destID] / [Rtvl #]. Used when the switch resends a message (due to an input Super RTVL or Super Number Gap message). The switch places the character string “RSND” in this field, followed by a 1-6 character Destination Id, a slash , and the 4 or 6 character retrieval number of the original message. Optional.
	space	Field separator. A space will be present if another field follows the Resend field.
	Alt Route	Holds the 1-6 character Destination ID of the original location the message was addressed to when the message has been rerouted. Optional.
	space	Field separator. A space will be present if another field follows the Alt Route field.
	Poss Dup	An optional “ PD ”. Holds the string value “PD” if the switch needs to indicate that this message may possibly be a duplicate of an earlier attempt to deliver the message. Optional.

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*Trailer Line 2 is present only when the Switch must indicate unusual situations to the user (message resend, alternate routing, and possible duplicate message). If the line is present, it will consist of one, two, or all three of the fields, with a **space** between each one.

A message that successfully passes the Switch validation and safestore procedures is forwarded to the specified application, which performs additional validation on the text of the message. If an error is detected, the user will receive a reject message explaining why the original message could not be processed. All reject messages sent from applications will be forwarded to the subscriber via the Switch and will be contained in a Standard Switch Output Message. If the text from an application is too large, the Switch will replace the text with the character string "-->" so that the message does not exceed 1024 characters. This string replaces the entire echo.

4.1.4 Message Numbers

Each output message delivered by the Switch is assigned two numbers:

1. A Message Sequence Number located in the output header.
2. A Message Retrieval Number located in the output trailer.

The Message Sequence and Message Retrieval numbers are independently maintained for each station and will normally be sequential.

The user detects missing messages by monitoring the Message Sequence Number for gaps, but must request message retrievals by using the Message Retrieval Number. The Message Sequence Number may wrap, be set back to 0001 via a REVERT TO SEQ 1 (SUPER) Message, or be manually altered by the Tandem Operations Staff, at any time so the Message Retrieval Number is necessary to uniquely identify all transmitted messages.

The Retrieval Number wraps to 0 after 65,535. Only the most recently output 65,535 messages are ever retrievable, so if output message counts for a particular station are expected to exceed 65,535 during the trading day the user may opt to configure multiple stations and employ the Switch's Balanced Delivery feature.

"Balanced Delivery" is a Message Switch configuration feature that allows subscriber-bound messages to be queued in round robin fashion to more than one output queue. This technique spreads like-addressed output messages over many output stations, effectively reducing the number of messages transmitted per station while increasing overall throughput.

This feature requires that multiple stations be configured for the firm and that any addresses used to direct messages to the 'prime' station queue be added to our Balanced Delivery Configuration (BDFILE) file. Configuration must be coordinated and tested with the Nasdaq Testing Facility (NTF).

4.2 SUPER Messages

4.2.1 Message Acknowledgment

Super Messages received by the Switch are subject to message validation, except that the Switch does not validate the value of the message sequence number contained in the trailer of a message. If the Switch rejects the message, a reject message is sent to the user. If the Switch accepts the message, a response is sent to the user to indicate the disposition of the Super Message. The format of the Super Message

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Acknowledgment is the Standard Switch Output Message format. The Super Message Acknowledgment message is a STATUS message.

If the Super message was processed successfully, the body of the Super Acknowledgment message is formatted as follows:

4.2.1.1 Acknowledgement Message Body Format #1

Line 1: [message category] <CR/LF>

Line 2: [message text] <CR/LF>

Line	Field	Description
1	message category	"STATUS". This field identifies the message category and will contain " STATUS ".
	<CR/LF>	Line delimiter.
2	message text	"SUPER MSG PROCESSED". This field contains the string "SUPER MSG PROCESSED", indicating that the function requested in the Super message has been performed.

If the message could not be processed due to an error in content or formatting or it could not be processed immediately, the body will contain:

4.2.1.2 Acknowledgement Message Body Format #2

Line 1: [message category] <CR/LF>

Line 2: [message text] <CR/LF>

Line 3: [additional clarification] <CR/LF>

Line 4-n: [input msg echo] <CR/LF>

Line	Field	Description
1	message category	"STATUS". This field identifies the message category and will contain " STATUS ".
	<CR/LF>	Line delimiter
2	message text	"SUPER MSG RECEIVED". This field contains the string "SUPER MSG RECEIVED", indicating that the switch received the Super message.
	<CR/LF>	Line delimiter
3	additional clarification	Variable text.
	<CR/LF>	Line delimiter
4-n	input msg echo	Copy of the super message. These lines are a copy of the entire input Super message, including the header.
	<CR/LF>	Line delimiter

4.2.2 Number Gap Message

If input message sequence checking is enabled and the Switch receives a message with a sequence number other than the number expected, the Switch will generate either a Number Gap status message or a Sequence Number Reject message. This message will be formatted as a separate output message in the Standard Switch Output Message format. Number Gap messages are SUPER messages.

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The body of the Number Gap message is formatted as follows:

Line 1: [message category] <CR/LF>
 Line 2: [message type] <CR/LF>
 Lines 3 - 6: [nnnn] [nnnn] [nnnn] [nnnn] <CR/LF>

Line	Field	Description
1	message category	"STATUS". This field identifies the message category and will contain " STATUS ".
	<CR/LF>	Line delimiter.
2	message type	"NUMBER GAP". This field contains the string "NUMBER GAP", indicating that this is a Number Gap message from the switch.
	<CR/LF>	Line delimiter.
3-6	nnnn nnnn nnnn nnnn	Up to 4 sets of 4 numeric characters. A number gap message can report up to 16 gaps, with up to 4 space separated sequence numbers on each line. The value nnnn represents the input sequence number of a missed message.
	<CR/LF>	Line delimiter

When 16 gaps become outstanding then all subsequent input will be rejected (reason: REJ-INVALID MSG SEQ NO) until one of the following occurs:

- one or more missing messages are resent with the original sequence number;
- one or more gaps are filled with the "self-addressed" ADMIN message;
- the station gap table is erased upon receipt of either the REVERT TO SEQ 1 or RESET ORDER SEQUENCE (SUPER) message;
- Nasdaq Operations Staff manually sets the next expected input sequence number, which also erases the station gap table.

4.3 Reject Messages

4.3.1 Switch Reject Messages

The Switch rejects a message received from a CTCI subscriber when the message fails to pass one of the Switch validation tests. The subscriber will receive a reject message in the Standard Switch Output Message format.

All reject messages are STATUS messages.

The body of a reject message is formatted as follows:

Line 1: [message category] <CR/LF>
 Line 2: [message type] [reason] <CR/LF>
 Lines 3 - n: [input msg Echo] <CR/LF>

Line	Field	Description
1	message category	"STATUS". This field identifies the message category and will contain " STATUS ".
	<CR/LF>	Line delimiter

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Line	Field	Description
2	message type	“REJ-” This field contains the string “REJ-”, indicating that this is a Reject message from the switch.
	Reason	Fixed text. This field indicates the reason for the rejection. If there was a problem with the input message, the following text may be reported in the reason field: <ul style="list-style-type: none"> ○ MSG EXCEEDS MAX SIZE, message is greater than 1024 ○ chars ○ INVALID FIRM, origin code is invalid ○ INVALID BRID/SEQ NO, branch office identifier is invalid ○ INVALID CATEGORY, category is invalid ○ DESTINATION INVALID, destination code is invalid ○ FORMAT ERROR, message is not in the proper format ○ INVALID MSG SEQ NO, message sequence number is missing, badly formatted, equal to zero, or the maximum number of gaps (16) was exceeded ○ SEQ NO REPEATED, sequence number duplicates the number of an earlier message. The message will not be accepted. ○ TOO MANY DESTINATIONS, Admin Message contains too many destination codes. ○ NOT ACCEPTING INPUTS, input station has been closed by the System Operator or the User. ○ UNKNOWN STATION, MMID entered on Line 0 by a Service Bureau firm does not equal the first four characters of the station associated with the select address. ○ REJspace-spaceSYSTEM UNAVAILABLE, The destination application/system is unavailable.
3-n	input msg echo	This is a copy of the entire rejected message, including the header and trailer.
	<CR/LF>	line delimiter

4.3.2 Application Reject Messages

A message that successfully passes the Switch validation and safestore procedures is forwarded to the specified application, which performs additional validation on the text of the message. If an error is detected, the user will receive a reject message explaining why the original message could not be processed. All reject messages sent from NASDAQ applications will be forwarded to the subscriber via the Switch and will be contained in General Output Message format.

All reject messages are STATUS messages.

If the application cannot process a message received from the user it will generate a Status Message that will indicate why the message was rejected. The format of an application reject message body is as follows:

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Application Reject Message Body

Line 1: [optional MMID] <CR/LF>
 Line 2: [message category] <CR/LF>
 Line 3: [reason] <CR/LF>
 Line 4-n: [echo] <CR/LF>

Line	Field	Description
1	optional MMID	4 characters (if present). Contains the 4-character MMID of the entering firm or the MMID of the firm the Service Bureau is acting for. If this option is utilized for multi-station lines, it will equal the 4-character MMID associated with the station.
	<CR/LF>	Line delimiter
2	message category	"STATUS". This field identifies the message category and will contain "STATUS".
	<CR/LF>	Line delimiter
3	reason	This field contains the text explaining why the application rejected the message. See Section 8 of this document for the NFN reject codes.
	<CR/LF>	Line delimiter
4-n	Echo	These lines are a copy of the entire input Application message, including the header and trailer.
	<CR/LF>	Line delimiter

Because the Switch may change the category destination to "OTHER m" on inbound messages to Nasdaq market center, "OTHER m" is a valid Category/Destination combination for reject messages sent from Nasdaq Market Center to Users (Line 4-n echo of original message). The destination code "m" is, however, not valid for inbound messages (user to Nasdaq Market Center). While Nasdaq Market Center does echo back the original message, the echo may contain "m" because the destination code was changed to "m" before Nasdaq Market Center received the message.

Subscriber Requirements for CTCI Communications

5 CTCI INPUT MESSAGES FOR NFN

This section covers the text message portion of the CTCI input message. Refer to the Nasdaq CTCI Message Switch document for message header and trailer information. This document is available for download via the CTCI product page on the NasdaqTrader.com website.

The following formats are covered in this section:

<u>Section</u>	<u>NFN Message Format</u>
5.1	NFN 0040 Data Formats (Legacy to be retired in August 2018)
5.1.1	Valuation – Mutual Funds, Annuities, Structured Products.
5.1.2	Valuation – Money Market Funds (Legacy to be retired in July 8, 2016)
5.1.3	Valuation – UIT Equity
5.1.4	Valuation – UIT Debt
5.2	NFN 0050 Data Formats (Current / Ongoing)
5.2.1.	Valuation – Mutual Funds, UITs, Annuities, Structured Products, AIPs, CITs, Managed Accounts, Separate Accounts, Hedge Funds Demand Deposit Accounts..
5.2.2	Valuation – Money Market Funds (no inbound time)
5.2.3	Valuation – Money Market Funds with Calculation Time
5.2.4	Corporate Action - Dividends / Interest for All NFN instruments
5.2.5	Corporate Action – Distributions for All NFN Instruments
5.3	System messages for both NFN versions
5.4	NFN Status Request Message
5.5	Group Update

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5.1 NFN 0040 Data Formats – Legacy

Nasdaq is retiring the 0040 message format as of August 20, 2018. All customers are expected to transition to the 0050 format in anticipation of this hot cut.

As previously announced, Nasdaq will soon retire the NFN 0040 message formats. Nasdaq is supporting the NFN 0040 data formats “as is” through the NFN transition period. Nasdaq is not adding any new functionality for NFN 0040 users.

For Money Market Funds, Nasdaq will cease to support the NFN 0040 message formats as of close of business on **Friday, July 8, 2016**.

5.1.1 Valuation – Mutual Funds (NFN 0040)

The format may be used by long-term mutual funds to submit just NAV and offer/market information on a daily basis, or it can be used to submit dividend and capital gain data. Nasdaq will also accept data for annuities and structured products via this message format.

Field	Offset	Length	Numeric Format	Description / Values
Function Code	0	2		“MR” for mutual fund updates.
NFN Symbol (pka Fund ID)	2	7		Nasdaq assigned ticker symbol for the mutual fund or annuity.
Footnotes	9	5		Any footnotes applicable for the fund. For instruments reported via the mutual fund message format, the allowable values are: “D” - Capital gains distribution “F” - Fund uses price of day prior to the day of reporting “N” - No load fund “P” - 12(b) 1 fee “R” - Redemption fee “S” - Stock split or dividend “X” - Cash dividend If there are no footnotes for a fund, please submit 5 spaces. To request a new footnote value, please contact NFN Operations .
NAV	14	5	\$\$\$dd	Net asset value for the fund. If unavailable, please submit “NA”.

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Field	Offset	Length	Numeric Format	Description / Values
NAV Override	19	1		Indicates if the system should ignore % price validations associated with this field. Allowable values: Space - override OFF "#" - override ON
Offer Price	20	5	\$\$\$dd	Updated offer price of the NFN instrument. Open-end funds and annuities should report offer price in the \$\$\$dd format. If unavailable, an open-end fund or annuity may submit "NA". Closed-end funds / ETFs and structured products must report "NA".
Offer Price Override	25	1		Indicates if the system should ignore % price validations associated with this field. Allowable values: Space - override OFF "#" - override ON
Market Price	26	7	\$\$\$dddd	Updated market price of the NFN instrument. Closed-end funds / ETFs and structured products should report market price in the \$\$\$dddd format. If unavailable, a closed end fund or structured product may submit "NA". Open-end funds and annuities must report "NA".
Market Price Override	33	1		Indicates if the system should ignore % price validations associated with this field. Allowable values: Space - override OFF "#" - override ON
Updated Flag - NAV/Offer/Market	34	1		Indicates if the NAV/Offer/Market information should be updated. Allowable values: "Y" - the NAV/Offer/Market information will be updated. (Default) "N" - the NAV/Offer/Market information will not be updated.
Entry Date	35	8	mmddyyyy	Date valuation data should be applied.

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description / Values
Total Cash Distribution (pka Cash dividend)	43	7	\$\$\$\$ddd	Amount of cash dividend. If unavailable, please submit "NA".
Total Cash Distribution Override (pka Cash dividend override)	50	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON
Stock Dividend Ratio	51	7	\$\$\$\$ddd	Indicates the stock split/dividend ratio. If unavailable, please submit "NA". Examples: <ul style="list-style-type: none"> • 2-for-1 stock split should be reported as "0002.000000". • 1-for-2 reverse stock split should be reported as "0000.500000". • 10% stock dividend would be reported as "0001.100000".
Stock Dividend Override	58	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON
Short-Term Capital Gain	59	7	\$\$\$\$ddd	Amount of short-term gain. If unavailable, please submit "NA".
Short-Term Capital Gain Override	66	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description / Values
Reserved	67	7		Field (other term gains) is no longer supported by NFN system. Space fill.
Reserved	74	1		Field is no longer supported by NFN system. Space fill.
Long-Term Capital Gain	75	7	\$\$\$\$dd	Amount of long-term gain. If unavailable, please submit "NA".
Long-Term Capital Gain override	82	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON
Unallocated Distributions	83	7	\$\$\$\$dd	Amount of unassigned term gains. If unavailable, please submit "NA".
Payment date	90	8	mmddyyyy	Indicates the dividend payment date for a fund. If no date, please submit spaces.
Record date	98	8	mmddyyyy	Indicates the dividend record date for a fund. If no date, please submit spaces.
Total Net Assets (pka Assets)	106	7	\$\$\$\$\$d	Indicates the total net assets for the fund <u>in millions of dollars</u> . Example: 0002501 = 250.1 million If unavailable, please submit "NA". See NFN 0040 to NFN 0050 mapping document for details.
Reserved	113	1		Space fill

Subscriber Requirements for CTCI Communications

5.1.2 Valuation - UIT Equity (NFN 0040)

This data format should be used by equity-based unit investment trusts (UITs) to report daily valuation data as well as distributions.

Field	Offset	Length	Numeric Format	Description
Function Code	0	2		"UE" for equity-based UIT updates.
NFN Symbol (pka Fund ID)	2	7		Nasdaq assigned ticker symbol of the trust.
Footnotes	9	5		Any footnotes applicable for the fund. For UITs, the current values are: "X" - Income Distribution. "D" - Capital Distributions. "O" - Primary Offering. "Y" - Secondary Offering. "W" - NRO Indicator. "H" - Deferred Sales Charge. "F" - Trust uses price of day prior to the day of reporting If there are no footnotes for a fund, please submit 5 spaces. To request a new footnote value, please contact NFN Operations .
Redemption Price (pka Redemption NAV)	14	10	\$\$\$\$ddddd	Price received if trust is redeemed. If unavailable, please submit "NA".
Redemption Price Override (pka Redemption NAV override)	24	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON
Offer Price	25	10	\$\$\$\$ddddd	The price paid to purchase units. If unavailable, please submit "NA".
Offer Price override	35	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description
Update Flag - Redemption Price/Offer Price	36	1		Indicates if the Redemption NAV/Offer price information should be updated. Allowable values are: "Y" - the NAV/Offer/Market information will be updated. (Default) "N" - the NAV/Offer/Market information will not be updated.
Wrap price	37	10	\$\$\$\$ddddd	The price paid to purchase units in a wrap account. If unavailable, please submit "NA".
Total Cash Distribution (pka Income distribution)	37	8	\$\$\$\$ddddd	Amount of income distribution. If unavailable, please submit "NA". See NFN 0040 to NFN 0050 mapping document for details.
Total Cash Distribution Override (pka Income distribution override)	55	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON
Return of Capital (ROC) (pka Capital distribution)	56	8	\$\$\$\$ddddd	Amount of capital distribution. If unavailable, please submit "NA". See NFN 0040 to NFN 0050 mapping document for details.
Record date	64	8	mmddyyyy	Indicates the record date for either an income distribution or a capital distribution. If no date, please submit spaces.
Payment date	72	8	mmddyyyy	Indicates the payment date for either an income distribution or a capital distribution. If no date, please submit spaces.
Entry date	80	8	mmddyyyy	Indicates the date associated with the valuation information. With the exception of prior day price corrections, this field should reflect the current business day's date.
Reserved	88	18		Space fill

Subscriber Requirements for CTCI Communications

5.1.3 Valuation - UIT Debt (NFN 0040)

This data format should be used by debt-based unit investment trusts (UITs) to report daily valuation data as well as distributions.

Field	Offset	Length	Numeric Format	Description
Function Code	0	2		"UD" for debt-based UIT updates.
Fund ID	2	7		Ticker or cross-reference symbol for the trust.
Footnotes	9	5		Any footnotes applicable for the fund. For UITs, the current values are: "X" - Income Distribution. "D" - Capital Distributions. "O" - Primary Offering. "Y" - Secondary Offering. "W" - NRO Indicator. "H" - Deferred Sales Charge. "F" - Trust uses price of day prior to the day of reporting If there are no footnotes for a fund, please submit 5 spaces. To request a new footnote value, please contact NFN Operations
Redemption Price (pka Redemption NAV)	14	10	\$\$\$\$ddddd	Price received if trust is redeemed. If unavailable, please submit "NA".
Redemption Price Override (pka Redemption NAV override)	24	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON
Offer Price	25	10	\$\$\$\$ddddd	The price paid to purchase units. If unavailable, please submit "NA".
Offer Price Override	35	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description
Updated Flag - Redemption Price /Offer Price	36	1		Indicates if the Redemption NAV and Offer price values should be updated. Allowable values are: "Y" - the NAV/Offer information will be updated. (Default) "N" - the NAV/Offer information will not be updated.
Wrap Price	37	10	\$\$\$\$ddddd	The price paid to purchase units in a wrap account. If unavailable, please submit "NA".
Current Yield	47	5	\$\$\$\$	The amount of return of the trust. If unavailable, please submit "NA".
ELTR	52	5	\$\$\$\$	Estimated long-term return (ELTR) of the trust. If unavailable, please submit "NA".
Accrued Interest	57	10	\$\$\$\$ddddd	Interest accrued since the last interest payment was made. If unavailable, please submit "NA".
Reserved	67	10	\$\$\$\$ddddd	Field (Par value per unit) is no longer supported on NFN system. Space fill. See NFN 0040 to NFN 0050 mapping document for details.
Total Cash Distribution (pka Income distribution)	77	8	\$\$\$\$dd	Amount of income distribution. If unavailable, please submit "NA". See NFN 0040 to NFN 0050 mapping document for details.
Total Cash Distribution Override (pka Income distribution override)	85	1		Indicates if the system should ignore validations on this field. Allowable values: Space - override OFF "#" - override ON
Return of Capital (ROC) (pka Capital distribution)	86	8	\$\$\$\$ddddd	Amount of capital distribution. If unavailable, please submit "NA". See NFN 0040 to NFN 0050 mapping document for details.
Record date	94	8	mmddyyyy	Indicates the record date for either an income distribution or a capital distribution. If no date, please submit spaces.
Payment date	102	8	mmddyyyy	Indicates the payment date for either an income distribution or a capital distribution. If no date, please submit spaces.

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description
Entry date	110	8	mmddyymm	Indicates the date associated with the valuation information. With the exception of prior day price corrections, this field should reflect the current business day's date.
Reserved	118	18		Space fill

Subscriber Requirements for CTCI Communications

5.2 NFN 0050 Data Formats

Due to the fixed nature of the NFN inbound message formats, it is very important that fields be the proper length and format.

- Numeric values must use the correct decimal placement and zero padding. Example: If a firm wanted to report a NAV of \$10.01 in NFN 0050 format, it would enter "000010.010000".
- Text values must be left justified and space padded. Example: If a firm wanted to report NA for Offer/Market Price in NFN 0050 format, it would enter "NA " (NA followed by 11 spaces).
- Dates must be entered in MMDDYYYY format. Example: June 13, 2011 would be entered as "06132011".
- CUSIP must be entered as 9 alphanumeric characters (with no spaces or special codes).

5.2.1 Valuation – Mutual Funds, Unit Investment Trusts (UITs), Annuities, Structured Products, Alternative Investment Products (AIPs), NextShares, Collective Investment Trusts, Managed Accounts, Separate Accounts, Hedge Funds, and Demand Deposit Accounts (NFN 0050)

This message format should be used to report daily valuation data for all NFN instrument classes except money market funds.

Field	Offset	Length	Numeric Format	Description	Required
Function Code	0	2		Defines inbound data format. "MF" for mutual fund, UIT, annuity, structured product, AIP updates, NextShares, Collective Investment Trust, Managed Accounts, Separate Accounts, and Hedge Fund.	Yes
Symbol (pka Fund ID)	2	11		Defines the NASDAQ assigned ticker symbol for NFN instrument. Note: This field was expanded to 11 bytes to accommodate for symbology changes as needed.	Yes
Footnotes	13	10		Any footnotes applicable for the NFN instrument. The allowable values are:	No for normal conditions Yes for ex-date adjustments

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required																																										
				<table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> <th>Fund Type</th> </tr> </thead> <tbody> <tr> <td>D</td> <td>Capital gains distribution*</td> <td>All</td> </tr> <tr> <td>F</td> <td>Fund uses prior day prices for NFN reporting purposes</td> <td>All</td> </tr> <tr> <td>H</td> <td>Deferred sales charge</td> <td>UIT</td> </tr> <tr> <td>I</td> <td>Repurchase Offer Period for Interval Funds</td> <td>Mutual Fund</td> </tr> <tr> <td>N</td> <td>No load fund</td> <td>Mutual Fund</td> </tr> <tr> <td>O</td> <td>Primary offering</td> <td>UIT</td> </tr> <tr> <td>P</td> <td>12(b)1 fee</td> <td>Mutual Fund</td> </tr> <tr> <td>R</td> <td>Redemption fee</td> <td>Mutual Fund</td> </tr> <tr> <td>S</td> <td>Stock split or dividend adjustment *</td> <td>All</td> </tr> <tr> <td>W</td> <td>NRO indicator</td> <td>UIT</td> </tr> <tr> <td>X</td> <td>Cash dividend, special cash dividend or income distribution adjustment*</td> <td>All</td> </tr> <tr> <td>Y</td> <td>Secondary offering</td> <td>UIT</td> </tr> <tr> <td>C</td> <td>Revaluation</td> <td>AIP and Structured Product</td> </tr> </tbody> </table> <p><i>*Note: For codes D, S and X, firms must also enter a separate Dividend/Interest or Capital Distribution message.</i></p> <p>Please contact NFN Operations if you wish to request a new footnote code.</p>	Code	Definition	Fund Type	D	Capital gains distribution*	All	F	Fund uses prior day prices for NFN reporting purposes	All	H	Deferred sales charge	UIT	I	Repurchase Offer Period for Interval Funds	Mutual Fund	N	No load fund	Mutual Fund	O	Primary offering	UIT	P	12(b)1 fee	Mutual Fund	R	Redemption fee	Mutual Fund	S	Stock split or dividend adjustment *	All	W	NRO indicator	UIT	X	Cash dividend, special cash dividend or income distribution adjustment*	All	Y	Secondary offering	UIT	C	Revaluation	AIP and Structured Product	
Code	Definition	Fund Type																																													
D	Capital gains distribution*	All																																													
F	Fund uses prior day prices for NFN reporting purposes	All																																													
H	Deferred sales charge	UIT																																													
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N	No load fund	Mutual Fund																																													
O	Primary offering	UIT																																													
P	12(b)1 fee	Mutual Fund																																													
R	Redemption fee	Mutual Fund																																													
S	Stock split or dividend adjustment *	All																																													
W	NRO indicator	UIT																																													
X	Cash dividend, special cash dividend or income distribution adjustment*	All																																													
Y	Secondary offering	UIT																																													
C	Revaluation	AIP and Structured Product																																													
Reporting Type	23	1		<p>Indicates the reporting frequency for NFN instrument. Proposed values are:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>R</td> <td>Daily / End of Day reporting (Default)</td> </tr> <tr> <td colspan="2"><i>Note: Firms may use the "R" code for funds that report on daily, weekly, bi-weekly, or quarterly basis.</i></td> </tr> <tr> <td>I</td> <td>Intraday Update</td> </tr> </tbody> </table>	Code	Definition	R	Daily / End of Day reporting (Default)	<i>Note: Firms may use the "R" code for funds that report on daily, weekly, bi-weekly, or quarterly basis.</i>		I	Intraday Update	Yes																																		
Code	Definition																																														
R	Daily / End of Day reporting (Default)																																														
<i>Note: Firms may use the "R" code for funds that report on daily, weekly, bi-weekly, or quarterly basis.</i>																																															
I	Intraday Update																																														

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required						
				<p><i>Note: On the outbound MFDS data feed, Nasdaq supports the "I" reporting type value on entries with the current trading date only. For prior entry dates, Nasdaq will treat "R" and "I" values in the same manner so vendors will only update the closing value.</i></p>							
NAV	24	12	\$\$\$\$\$ddddd	<p>Indicates the net asset value (NAV) for the NFN instrument. If unavailable, please submit "NA".</p> <p><i>Note: UITs must report Redemption Price (rather than NAV).</i></p>	Yes						
NAV Override	36	1		<p>Indicates if the system should ignore % price validations associated with the NAV field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No
Code	Definition										
#	Override On										
<space>	Override Off (Default)										
Offer Price/ Market Price	37	12	\$\$\$\$\$ddddd	<p>Offer prices are typically reported by open end mutual funds, UITs, annuities, and AIPs. For these instruments, the price should reflect the price at which an investor can purchase shares.</p> <p>Market prices are typically reported by closed end funds and other exchange traded instruments. For these instruments, the price should reflect the closing price on the primary market.</p> <p>If unavailable, please submit "NA".</p>	Yes						
Offer / Market Price Override	49	1		<p>Indicates if the system should ignore % price validations associated with the offer price and market price field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No
Code	Definition										
#	Override On										
<space>	Override Off (Default)										
Redemption Price (UITs only)	50	12	\$\$\$\$\$ddddd	<p>Indicates the amount that an investor would receive if he were to redeem UIT shares. If unavailable, please submit "NA".</p> <p>If space filled, Nasdaq will populate the field as "NA".</p>	Yes for UITs only						

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required								
				<i>Note: Only UITs should report Redemption Price. Other asset classes should populate NAV (rather than Redemption Price) field.</i>									
Redemption Price Override (UITs only)	62	1		Indicates if the system should ignore % price validations associated with the redemption price field. Allowable values: <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No		
Code	Definition												
#	Override On												
<space>	Override Off (Default)												
Wrap Price	63	12	\$\$\$\$\$ddddd	The price paid to purchase units in a wrap account. If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	Yes for UITs only								
Total Net Assets	75	15	\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$	Indicates the total net assets (actual amount in <u>dollars</u>) for instrument. If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No								
Total Net Assets Override	90	1		Indicates if the system should ignore system validations associated with the Total Net Asset field. Allowable values: <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No		
Code	Definition												
#	Override On												
<space>	Override Off (Default)												
Current Yield	91	8	\$\$\$\$ddd	The annual rate of return on investment. If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No								
Current Yield Direction	99	1		Indicates if the current yield is a positive or negative number. <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Negative yield;</td> </tr> <tr> <td><dash></td> <td>Current yield is less than 0.00% so it should be displayed with negative sign.</td> </tr> <tr> <td><space></td> <td>Positive or zero yield (Default)</td> </tr> </tbody> </table>	Code	Definition	-	Negative yield;	<dash>	Current yield is less than 0.00% so it should be displayed with negative sign.	<space>	Positive or zero yield (Default)	Yes only if Current Yield is reported.
Code	Definition												
-	Negative yield;												
<dash>	Current yield is less than 0.00% so it should be displayed with negative sign.												
<space>	Positive or zero yield (Default)												

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required						
ELTR	100	8	\$\$\$\$dddd	Estimated long term return (ELTR) or estimated yield over the life of the portfolio of a UIT or other NFN instrument. If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No						
ETLR Direction	108	1		Indicates if the ELTR value is a positive or negative number. <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>- <dash></td> <td>Negative yield; ELTR is less than 0.00% so it should be displayed with negative sign.</td> </tr> <tr> <td><space></td> <td>Positive or zero ELTR(Default)</td> </tr> </tbody> </table>	Code	Definition	- <dash>	Negative yield; ELTR is less than 0.00% so it should be displayed with negative sign.	<space>	Positive or zero ELTR(Default)	Yes only if ELTR is reported.
Code	Definition										
- <dash>	Negative yield; ELTR is less than 0.00% so it should be displayed with negative sign.										
<space>	Positive or zero ELTR(Default)										
Accrued Interest	109	12	\$\$\$\$\$ddddddd	Interest accrued since the last interest payment was made. If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No						
Daily Dividend Factor	121	8	\$\$\$\$\$\$\$\$	Indicates the dividend factor if the fund or UIT declares a daily dividend. Please note that firms should make dividend adjustments for weekends and holidays as necessary. If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA". <i>Note: Nasdaq supports a separate Dividend message format to be used for non-daily dividend distributions. The Dividend message format may also be used for reporting of dividend values with up to 6 decimal digits.</i>	No						
Daily Dividend Adjustment Indicator	129	1		Indicates if the Daily Dividend Adjustment Factor was fattened to reflect weekend, holiday or other non-reported period. Allowable values are: <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Fat adjustment reflected in Daily Dividend Factor</td> </tr> </tbody> </table>	Code	Definition	Y	Fat adjustment reflected in Daily Dividend Factor	Yes only if Daily Dividend is reported as numeric value		
Code	Definition										
Y	Fat adjustment reflected in Daily Dividend Factor										

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required				
				<table border="1"> <tr> <td>N</td> <td>No fat adjustment for Daily Dividend Factor</td> </tr> <tr> <td><space></td> <td>Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.</td> </tr> </table>	N	No fat adjustment for Daily Dividend Factor	<space>	Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.	
N	No fat adjustment for Daily Dividend Factor								
<space>	Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.								
Entry Date	130	8	MMDDYYYY	Reflects the date for which the daily update is valid. Except for prior day corrections, this field should reflect the current day's date.	Yes				
Currency	138	3		<p>Indicates the ISO currency code associated with the NFN price-related fields. For this field, Nasdaq will use ISO 4217 currency alphabetic codes.</p> <p>For NFN 0050, if this field is space filled, Nasdaq will populate the value as assigned in the listing.</p>	No				
CUSIP	141	9		Indicates the unique security identifier as assigned by S&P CUSIP Bureau for NFN instrument. Note: This field must adhere to the basic CUSIP format - 9 alphanumeric characters (no special characters).	Yes				

5.2.2 Valuation – Money Market Funds (NFN 0050)

This message format should be used by money market funds to report daily or weekly valuation data.

Note: While this version of the money market fund message format may be used for intraday valuation reporting, it does not support an inbound time stamp. Downstream market data distributors will, therefore, display intraday records with associated NFN dissemination time.

Field	Offset	Length	Numeric Format	Description	Required
Function Code	0	2		Defines inbound data format. "\$\$" for money market fund updates with no inbound time.	Yes
Symbol (pka Fund ID)	2	11		<p>Defines the NASDAQ assigned ticker symbol for NFN instrument.</p> <p>Note: This field was expanded to 11 bytes to accommodate for symbology changes as needed.</p>	Yes

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required																		
Footnotes	13	10		<p>Any footnotes applicable for the NFN instrument. The allowable values for money market funds are:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Fund's return may differ due to capital gains or losses.</td> </tr> <tr> <td>B</td> <td>Sales or account charges may impact yield.</td> </tr> <tr> <td>F</td> <td>Fund uses price of day prior to the day of reporting.</td> </tr> <tr> <td>G</td> <td>Redemption gate in effect</td> </tr> <tr> <td>L</td> <td>Liquidity fee in effect</td> </tr> <tr> <td>S</td> <td>Stock split dividend*</td> </tr> <tr> <td>D</td> <td>Capital Distribution*</td> </tr> <tr> <td>X</td> <td>Cash dividend, special cash dividend or income distribution adjustment*</td> </tr> </tbody> </table> <p><i>*Note: For codes D, S and X, firms must also enter a separate Dividend/Interest or Capital Distribution message.</i></p> <p>Please contact NFN Operations if you wish to request a new footnote code.</p>	Code	Definition	A	Fund's return may differ due to capital gains or losses.	B	Sales or account charges may impact yield.	F	Fund uses price of day prior to the day of reporting.	G	Redemption gate in effect	L	Liquidity fee in effect	S	Stock split dividend*	D	Capital Distribution*	X	Cash dividend, special cash dividend or income distribution adjustment*	No
Code	Definition																						
A	Fund's return may differ due to capital gains or losses.																						
B	Sales or account charges may impact yield.																						
F	Fund uses price of day prior to the day of reporting.																						
G	Redemption gate in effect																						
L	Liquidity fee in effect																						
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D	Capital Distribution*																						
X	Cash dividend, special cash dividend or income distribution adjustment*																						
Reporting Type	23	1		<p>Indicates the reporting frequency for NFN instrument. Proposed values are:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>R</td> <td>Daily / End of Day reporting (Default) <i>Note: Firms may use the "R" code for funds that report on daily, weekly, bi-weekly, or quarterly basis.</i></td> </tr> <tr> <td>I</td> <td>Intraday Update <i>Note: On the outbound MFDS data feed, Nasdaq supports the "I" reporting type value on entries with the current trading date only. For prior entry dates, Nasdaq will treat "R" and "I" values in the same manner so vendors will only update the closing value.</i></td> </tr> </tbody> </table>	Code	Definition	R	Daily / End of Day reporting (Default) <i>Note: Firms may use the "R" code for funds that report on daily, weekly, bi-weekly, or quarterly basis.</i>	I	Intraday Update <i>Note: On the outbound MFDS data feed, Nasdaq supports the "I" reporting type value on entries with the current trading date only. For prior entry dates, Nasdaq will treat "R" and "I" values in the same manner so vendors will only update the closing value.</i>	Yes												
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Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required						
Average Maturity	24	3	NNN	Average maturity reported in number of days. If unavailable, please submit "NA".	Yes						
Average Life	27	3	NNN	Average life as calculated in accordance with the SEC Money Market Reform Act. If unavailable, please submit "NA".	Yes						
NAV	30	12	\$\$\$\$\$ddddd	Indicates the net asset value (NAV) for the fund. If unavailable, please submit "NA".	Yes						
NAV Override	42	1		Indicates if the system should ignore price validations associated with the money market NAV field. Allowable values: <table border="1" data-bbox="957 672 1604 764"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No
Code	Definition										
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Gross 7 Day Yield	43	8	\$\$\$\$\$ddd	Provides yield based on average net income earned by the securities in the fund's portfolio during the past seven days. In accordance with the SEC definition , gross seven day yield should exclude capital changes and income other than investment income. In addition, the gross seven day yield should not reflect a deduction of shareholders fees and fund operating expenses. If unavailable, please submit "NA". Note: A direction field is being added to support negative yield values. Once implemented, NASDAQ will discontinue the temporary footnote code of "0".	Yes						
Gross 7 Day Yield Direction	51	1		Indicates if the gross seven day yield value is positive or negative. Allowable values: <table border="1" data-bbox="957 1260 1604 1377"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Negative yield;</td> </tr> <tr> <td><dash></td> <td>Gross yield is less than 0.00% so it should be displayed with negative sign.</td> </tr> </tbody> </table>	Code	Definition	-	Negative yield;	<dash>	Gross yield is less than 0.00% so it should be displayed with negative sign.	Yes only if yield is negative
Code	Definition										
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Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required								
				<table border="1"> <tr> <td><space></td> <td>Positive or zero yield (Default)</td> </tr> </table>	<space>	Positive or zero yield (Default)							
<space>	Positive or zero yield (Default)												
Gross 7 Day Yield Override	52	1		<p>Indicates if the system should ignore % validations associated with the Seven Day Yield field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No		
Code	Definition												
#	Override On												
<space>	Override Off (Default)												
Subsidized 7 Day Yield	53	8	\$\$\$\$dddd	<p>The subsidized yield (also known as simple yield) reflects the yield calculation with expense limitation currently in effect. If unavailable, please submit "NA".</p> <p>Note: A direction field is being added to support negative yield values. Once implemented, Nasdaq will discontinue the temporary footnote code of "0".</p>	Yes								
Subsidized 7 Day Yield Direction	61	1		<p>Indicates if the subsidized seven day yield – subsidized value is positive or negative. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Negative yield;</td> </tr> <tr> <td><dash></td> <td>Subsidized yield is less than 0.00% so it should be displayed with negative sign.</td> </tr> <tr> <td><space></td> <td>Positive or zero yield (Default)</td> </tr> </tbody> </table>	Code	Definition	-	Negative yield;	<dash>	Subsidized yield is less than 0.00% so it should be displayed with negative sign.	<space>	Positive or zero yield (Default)	Yes only if yield is negative
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Code	Definition												
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Effective Annualized 7 Day Yield	63	8	\$\$\$\$dddd	<p>Reflects the expected annualized yield assuming that any income earned was reinvested.</p> <p>If unavailable, please submit "NA". If this field is space filled, Nasdaq will disseminate this field as "NA".</p>	No								
Effective Annualized 7	71	1		<p>Indicates if the effective annualized seven day yield value is positive or negative. Allowable values:</p>	No								

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required								
Day Yield Direction				<table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Negative yield;</td> </tr> <tr> <td><dash></td> <td>Effective annualized yield is less than 0.00% so it should be displayed with negative sign.</td> </tr> <tr> <td><space></td> <td>Positive or zero yield (Default)</td> </tr> </tbody> </table>	Code	Definition	-	Negative yield;	<dash>	Effective annualized yield is less than 0.00% so it should be displayed with negative sign.	<space>	Positive or zero yield (Default)	
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<dash>	Effective annualized yield is less than 0.00% so it should be displayed with negative sign.												
<space>	Positive or zero yield (Default)												
30 Day Yield	72	8	\$\$\$\$ddddd	<p>Indicates the 30 day yield value based on the SEC calculation methodology with expense limitation currently in effect.</p> <p>If unavailable, please submit "NA". If this field is space filled, Nasdaq will disseminate this field as "NA".</p>	No								
30 Day Yield Direction	80	1		<p>Indicates if the 30 day yield value is positive or negative. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Negative yield;</td> </tr> <tr> <td><dash></td> <td>30 day yield is less than 0.00% so it should be displayed with negative sign.</td> </tr> <tr> <td><space></td> <td>Positive or zero yield (Default)</td> </tr> </tbody> </table>	Code	Definition	-	Negative yield;	<dash>	30 day yield is less than 0.00% so it should be displayed with negative sign.	<space>	Positive or zero yield (Default)	No
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-	Negative yield;												
<dash>	30 day yield is less than 0.00% so it should be displayed with negative sign.												
<space>	Positive or zero yield (Default)												
30 Day Yield Date	81	8	MMDDYYYY	<p>Indicates the period end date for which the 30 day yield was calculated.</p> <p>If unavailable, please submit "NA".</p> <p>If this field is space filled, Nasdaq will disseminate this field as "NA".</p>	Yes only if 30 day yield is reported								
Daily Dividend Factor	89	8	\$\$\$\$ddddd	<p>Indicates the dividend factor if the money market fund declares a daily dividend. Please note that firms should make dividend adjustments for weekends and holidays as necessary.</p> <p>If unavailable, please submit "NA".</p> <p>If this field is space filled, Nasdaq will disseminate this field as "NA".</p>	No								

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required								
				<i>Note: Nasdaq supports a separate Dividend message format to be used for non-daily dividend distributions. The Dividend message format may also be used for reporting of dividend values with up to 6 decimal digits.</i>									
Daily Dividend Adjustment Indicator	97	1		<p>Indicates if the Daily Dividend Adjustment Factor was fattened to reflect weekend, holiday or other non-reported period.</p> <p>Allowable values are:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Fat adjustment reflected in Daily Dividend Factor</td> </tr> <tr> <td>N</td> <td>No fat adjustment for Daily Dividend Factor</td> </tr> <tr> <td><space></td> <td>Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.</td> </tr> </tbody> </table>	Code	Definition	Y	Fat adjustment reflected in Daily Dividend Factor	N	No fat adjustment for Daily Dividend Factor	<space>	Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.	Yes only if Daily Dividend is reported as numeric value
Code	Definition												
Y	Fat adjustment reflected in Daily Dividend Factor												
N	No fat adjustment for Daily Dividend Factor												
<space>	Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.												
Total Net Assets	98	15	\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$	<p>Indicates the total net assets (actual amount in <u>dollars</u>) for instrument.</p> <p>If available, please submit "NA".</p> <p>If this field is space filled, Nasdaq will disseminate this field as "NA".</p>	No								
Total Net Assets Override	113	1		<p>Indicates if the system should ignore system validations associated with the Total Net Asset field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No		
Code	Definition												
#	Override On												
<space>	Override Off (Default)												
Entry Date (pka Date)	114	8	MMDDYYYY	Reflects the date for which the daily update is valid. Except for prior day corrections, this field should reflect the current day's date.	Yes								
Currency	122	3		Indicates the ISO currency code associated with the NFN price-related fields. For this field, Nasdaq will use ISO 4217 currency alphabetic codes .	No								

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required
				For NFN 0050, if this field is space filled, Nasdaq will populate the value as assigned in the listing.	
CUSIP	125	9		Indicates the unique security identifier as assigned by S&P CUSIP Bureau for NFN instrument. Note: This field must adhere to the basic CUSIP format - 9 alphanumeric characters (no special characters).	Yes

5.2.3 Valuation – Money Market Funds with Calculation Time (NFN 0050)

This message format should be used by money market funds to report intraday, daily or weekly valuation data. Firms should use this version of the money market fund message format if they wish to have a specific NAV calculation time displayed.

Field	Offset	Length	Numeric Format	Description	Required																
Function Code	0	2		Defines inbound data format. "\$M" for money market fund updates with calculation time.	Yes																
Symbol (pka Fund ID)	2	11		Defines the NASDAQ assigned ticker symbol for NFN instrument. Note: This field was expanded to 11 bytes to accommodate for symbology changes as needed.	Yes																
Footnotes	13	10		Any footnotes applicable for the NFN instrument. The allowable values for money market funds are: <table border="1" data-bbox="955 998 1717 1367"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Fund's return may differ due to capital gains or losses.</td> </tr> <tr> <td>B</td> <td>Sales or account charges may impact yield.</td> </tr> <tr> <td>F</td> <td>Fund uses price of day prior to the day of reporting.</td> </tr> <tr> <td>G</td> <td>Redemption gate in effect</td> </tr> <tr> <td>L</td> <td>Liquidity fee in effect</td> </tr> <tr> <td>S</td> <td>Stock split dividend*</td> </tr> <tr> <td>D</td> <td>Capital Distribution*</td> </tr> </tbody> </table>	Code	Definition	A	Fund's return may differ due to capital gains or losses.	B	Sales or account charges may impact yield.	F	Fund uses price of day prior to the day of reporting.	G	Redemption gate in effect	L	Liquidity fee in effect	S	Stock split dividend*	D	Capital Distribution*	No
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Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required										
				<table border="1"> <tr> <td>X</td> <td>Cash dividend, special cash dividend or income distribution adjustment*</td> </tr> </table> <p>*Note: For codes D, S and X, firms must also enter a separate Dividend/Interest or Capital Distribution message.</p> <p>Please contact NFN Operations if you wish to request a new footnote code.</p>	X	Cash dividend, special cash dividend or income distribution adjustment*									
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Reporting Type	23	1		<p>Indicates the reporting frequency for NFN instrument. Proposed values are:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>R</td> <td>Daily / End of Day reporting (Default)</td> </tr> <tr> <td colspan="2"><i>Note: Firms may use the "R" code for funds that report on daily, weekly, bi-weekly, or quarterly basis.</i></td> </tr> <tr> <td>I</td> <td>Intraday Update</td> </tr> <tr> <td colspan="2"><i>Note: On the outbound NFN Data Service feed, Nasdaq supports the "I" reporting type value on entries with the current trading date only. For prior entry dates, Nasdaq will treat "R" and "I" values in the same manner so vendors will only update the closing value.</i></td> </tr> </tbody> </table>	Code	Definition	R	Daily / End of Day reporting (Default)	<i>Note: Firms may use the "R" code for funds that report on daily, weekly, bi-weekly, or quarterly basis.</i>		I	Intraday Update	<i>Note: On the outbound NFN Data Service feed, Nasdaq supports the "I" reporting type value on entries with the current trading date only. For prior entry dates, Nasdaq will treat "R" and "I" values in the same manner so vendors will only update the closing value.</i>		Yes
Code	Definition														
R	Daily / End of Day reporting (Default)														
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Average Maturity	24	3	NNN	Average maturity reported in number of days. If unavailable, please submit "NA".	Yes										
Average Life	27	3	NNN	Average life as calculated in accordance with the SEC Money Market Reform Act. If unavailable, please submit "NA".	Yes										
NAV	30	12	\$\$\$\$\$ddddd	Indicates the net asset value (NAV) for the fund. If unavailable, please submit "NA".	Yes										
NAV Override	42	1		<p>Indicates if the system should ignore price validations associated with the money market NAV field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> </tbody> </table>	Code	Definition	#	Override On	No						
Code	Definition														
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Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required								
				<space> Override Off (Default)									
Gross 7 Day Yield	43	8	\$\$\$\$ddddd	<p>Provides yield based on average net income earned by the securities in the fund’s portfolio during the past seven days.</p> <p>In accordance with the SEC definition, gross seven day yield should exclude capital changes and income other than investment income. In addition, the gross seven day yield should not reflect a deduction of shareholders fees and fund operating expenses.</p> <p>If unavailable, please submit “NA”.</p>	Yes								
Gross 7 Day Yield Direction	51	1		<p>Indicates if the gross seven day yield value is positive or negative. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Negative yield;</td> </tr> <tr> <td><dash></td> <td>Gross yield is less than 0.00% so it should be displayed with negative sign.</td> </tr> <tr> <td><space></td> <td>Positive or zero yield (Default)</td> </tr> </tbody> </table>	Code	Definition	-	Negative yield;	<dash>	Gross yield is less than 0.00% so it should be displayed with negative sign.	<space>	Positive or zero yield (Default)	Yes only if yield is negative
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Gross 7 Day Yield Override	52	1		<p>Indicates if the system should ignore % validations associated with the Seven Day Yield field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No		
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Subsidized 7 Day Yield	53	8	\$\$\$\$ddddd	<p>The subsidized yield (also known as simple yield) reflects the yield calculation with expense limitation currently in effect. If unavailable, please submit “NA”.</p> <p>Note: A direction field is being added to support negative yield values. Once implemented, Nasdaq will discontinue the temporary footnote code of “0”.</p>	Yes								
Subsidized 7 Day Yield Direction	61	1		<p>Indicates if the subsidized seven day yield – subsidized value is positive or negative. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> </tbody> </table>	Code	Definition	Yes only if yield is negative						
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<space>	Positive or zero yield (Default)												
Subsidized 7 Day Yield Override	62	1		<p>Indicates if the system should ignore % validations associated with the Subsidized Seven Day Yield field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No		
Code	Definition												
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Effective Annualized 7 Day Yield	63	8	\$\$\$\$dddd	<p>Reflects the expected annualized yield assuming that any income earned was reinvested.</p> <p>If unavailable, please submit "NA". If this field is space filled, Nasdaq will disseminate this field as "NA".</p>	No								
Effective Annualized 7 Day Yield Direction	71	1		<p>Indicates if the effective annualized seven day yield value is positive or negative. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Negative yield;</td> </tr> <tr> <td><dash></td> <td>Effective annualized yield is less than 0.00% so it should be displayed with negative sign.</td> </tr> <tr> <td><space></td> <td>Positive or zero yield (Default)</td> </tr> </tbody> </table>	Code	Definition	-	Negative yield;	<dash>	Effective annualized yield is less than 0.00% so it should be displayed with negative sign.	<space>	Positive or zero yield (Default)	No
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30 Day Yield	72	8	\$\$\$\$dddd	<p>Indicates the 30 day yield value based on the SEC calculation methodology with expense limitation currently in effect.</p> <p>If unavailable, please submit "NA". If this field is space filled, Nasdaq will disseminate this field as "NA".</p>	No								
30 Day Yield Direction	80	1		<p>Indicates if the 30 day yield value is positive or negative. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>Negative yield;</td> </tr> <tr> <td><dash></td> <td>30 day yield is less than 0.00% so it should be displayed with negative sign.</td> </tr> </tbody> </table>	Code	Definition	-	Negative yield;	<dash>	30 day yield is less than 0.00% so it should be displayed with negative sign.	No		
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Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required								
				<space> Positive or zero yield (Default)									
30 Day Yield Date	81	8	MMDDYYYY	Indicates the period end date for which the 30 day yield was calculated. If unavailable, please submit "NA". If this field is space filled, Nasdaq will disseminate this field as "NA".	Yes only if 30 day yield is reported								
Daily Dividend Factor	89	8	\$\$\$\$\$\$\$\$	Indicates the dividend factor if the money market fund declares a daily dividend. Please note that firms should make dividend adjustments for weekends and holidays as necessary. If unavailable, please submit "NA". If this field is space filled, Nasdaq will disseminate this field as "NA". <i>Note: Nasdaq supports a separate Dividend message format to be used for non-daily dividend distributions. The Dividend message format may also be used for reporting of dividend values with up to 6 decimal digits.</i>	No								
Daily Dividend Adjustment Indicator	97	1		Indicates if the Daily Dividend Adjustment Factor was fattened to reflect weekend, holiday or other non-reported period. Allowable values are: <table border="1" data-bbox="957 1024 1587 1289"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>Fat adjustment reflected in Daily Dividend Factor</td> </tr> <tr> <td>N</td> <td>No fat adjustment for Daily Dividend Factor</td> </tr> <tr> <td><space></td> <td>Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.</td> </tr> </tbody> </table>	Code	Definition	Y	Fat adjustment reflected in Daily Dividend Factor	N	No fat adjustment for Daily Dividend Factor	<space>	Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.	Yes only if Daily Dividend is reported as numeric value
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Y	Fat adjustment reflected in Daily Dividend Factor												
N	No fat adjustment for Daily Dividend Factor												
<space>	Not applicable - Daily Dividend Factor field is populated as "NA" or space filled.												
Total Net Assets	98	15	\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$	Indicates the total net assets (actual amount in <u>dollars</u>) for instrument.	No								

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required						
				<p>If available, please submit "NA".</p> <p>If this field is space filled, Nasdaq will disseminate this field as "NA".</p>							
Total Net Assets Override	113	1		<p>Indicates if the system should ignore system validations associated with the Total Net Asset field. Allowable values:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No
Code	Definition										
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<space>	Override Off (Default)										
Entry Date (pka Date)	114	8	MMDDYYYY	Reflects the date for which the daily update is valid. Except for prior day corrections, this field should reflect the current day's date.	Yes						
Currency	122	3		<p>Indicates the ISO currency code associated with the NFN price-related fields. For this field, Nasdaq will use ISO 4217 currency alphabetic codes.</p> <p>For NFN 0050, if this field is space filled, Nasdaq will populate the value as assigned in the listing.</p>	No						
CUSIP	125	9		Indicates the unique security identifier as assigned by S&P CUSIP Bureau for NFN instrument. Note: This field must adhere to the basic CUSIP format - 9 alphanumeric characters (no special characters).	Yes						
Calculation Time	134	6	HHMMSS	<p>Indicates the calculation time associated with the money market fund record. Calculation time must be stated in military time for the US Eastern Time zone.</p> <p>Examples:</p> <ul style="list-style-type: none"> • 11:00 a.m. Eastern Time should be reported as "110000". • 10:00 a.m., Central Time should be reported as "110000". • 4:00 p.m., Eastern Time should be reported as "160000". <p>If unavailable, enter "NA".</p>							

Subscriber Requirements for CTCI Communications

5.2.4 Distributions Report – All NFN Instruments (NFN 0050)

This message format should be used to report distributions (other than dividends and interest) for all NFN instruments.

Field	Offset	Length	Numeric Format	Description	Required						
Function Code	0	2		Defines inbound data format. "DS" for distributions.	Yes						
Symbol (pka Fund ID)	2	11		Defines the Nasdaq assigned ticker symbol for NFN instrument. <u>Note:</u> The NFN processing logic relies on the Fund ID field for the MFDS corporate action spin. If the Fund ID field needs to be adjusted, Nasdaq recommends that firms cancel and re-enter the distribution record (rather than correcting the record).	Yes						
Short Term Capital Gain	13	12	\$\$\$\$\$ddddd	Indicates the portion of the total capital gain that is taxed to the shareholder as ordinary income. If unavailable, please submit "NA".	Yes						
Short Term Capital Gain Override	25	1		Indicates if the system should ignore system validations associated with the Total Net Asset field. Allowable values: <table border="1" data-bbox="949 787 1579 878"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No
Code	Definition										
#	Override On										
<space>	Override Off (Default)										
Long Term Capital Gain	26	12	\$\$\$\$\$ddddd	Indicates the portion of the total capital gain that is taxed to the shareholder at the long-term capital gains rate. If unavailable, please submit "NA".	Yes						
Long Term Capital Gain Override	38	1		Indicates if the system should ignore system validations associated with the Total Net Asset field. Allowable values: <table border="1" data-bbox="949 1027 1711 1118"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No
Code	Definition										
#	Override On										
<space>	Override Off (Default)										
Unallocated Distributions	39	12	\$\$\$\$\$ddddd	Amount of unassigned term gains. If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No						
Return of Capital (ROC)	51	12	\$\$\$\$\$ddddd	Indicates amount of return of capital (ROC) to the instrument shareholders. If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No						

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required								
ROC Override	63	1		<p>Indicates if the system should ignore system validations associated with the ROC field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No		
Code	Definition												
#	Override On												
<space>	Override Off (Default)												
Payment Date	64	8	MMDDYYYY	<p>Indicates the payment date for an income distribution or a capital distribution.</p> <p>If no payment date, please submit "NA".</p>	Yes								
Record Date	72	8	MMDDYYYY	<p>Indicates the record date for the distribution. Shareholders of the instrument as of this date would receive the distribution.</p> <p>If no record date, please submit "NA".</p>	Yes								
Ex Date	80	8	MMDDYYYY	<p>Indicates the ex date for the distribution. This is the date that NAV should be adjusted.</p> <p><u>Note:</u> The NFN processing logic relies on the Ex-Date field for the NFN Data Service corporate action spin. If the Ex-Date field needs to be adjusted, Nasdaq recommends that firms cancel and re-enter the distribution record (rather than correcting the record).</p>	Yes								
Reinvest Date	88	8	MMDDYYYY	<p>Indicates the reinvestment date for the distribution.</p> <p>If no reinvestment, please submit "NA".</p>	Yes								
Action	96	1		<p>Indicates if the NFN dividend / distribution report is a new entry or corrected entry. Allowable values are:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>New entry</td> </tr> <tr> <td>C</td> <td>Corrected entry</td> </tr> <tr> <td>X</td> <td>Cancelled distribution</td> </tr> </tbody> </table> <p><u>Note:</u> Please enter the full record for cancelled and corrected entries.</p>	Code	Definition	N	New entry	C	Corrected entry	X	Cancelled distribution	Yes
Code	Definition												
N	New entry												
C	Corrected entry												
X	Cancelled distribution												

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required
				Because the NFN logic is based on the symbol and ex-date fields, Nasdaq highly recommends that firms enter a Fund ID or Ex-Date correction as two separate entries: a cancellation for the original entry plus a new entry with the corrected information.	
Currency	97	3		Indicates the ISO currency code associated with the NFN price-related fields. For this field, Nasdaq will use ISO 4217 currency alphabetic codes . For NFN 0050, if this field is space filled, Nasdaq will populate the value as assigned in the listing.	No
CUSIP	100	9		Indicates the unique security identifier as assigned by S&P CUSIP Bureau for NFN instrument. Note: This field must adhere to the basic CUSIP format - 9 alphanumeric characters (no special characters).	Yes

5.2.5 Dividend / Interest – All NFN Instruments (NFN 0050)

This message format should be used to report dividends and interest payments for all NFN instruments.

Field	Offset	Length	Numeric Format	Description	Required				
Function Code	0	2		Defines inbound data format. "DI" for dividends and interest.	Yes				
Symbol (pka Fund ID)	2	11		Defines the NASDAQ assigned ticker symbol for NFN instrument. <u>Note:</u> The NFN processing logic relies on the Fund ID field for the MFDS corporate action spin. If the Fund ID field needs to be adjusted, Nasdaq recommends that firms cancel and re-enter the distribution record (rather than correcting the record).	Yes				
Cash Distribution Type	13	1		Indicates the type of cash distribution being reported. The allowable values would be: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>D</td> <td>Cash Dividend (Default for Mutual Funds)</td> </tr> </tbody> </table>	Code	Definition	D	Cash Dividend (Default for Mutual Funds)	Yes
Code	Definition								
D	Cash Dividend (Default for Mutual Funds)								

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required						
				<table border="1"> <tr> <td>I</td> <td>Interest Income (Default for UITs)</td> </tr> <tr> <td>S</td> <td>Special Cash Dividend</td> </tr> <tr> <td><space></td> <td>Not applicable, no cash distribution being reported</td> </tr> </table> <p>Note: <u>As of the 3rd Quarter 2013</u>, Nasdaq will modify the Action processing logic to include the Cash Distribution Type field. If a firm needs to change the Cash Distribution Type, Nasdaq recommends that firms cancel and re-enter the distribution record (rather than correcting the record).</p>	I	Interest Income (Default for UITs)	S	Special Cash Dividend	<space>	Not applicable, no cash distribution being reported	
I	Interest Income (Default for UITs)										
S	Special Cash Dividend										
<space>	Not applicable, no cash distribution being reported										
Total Cash Distribution	14	12	\$\$\$\$\$ddddd	<p>Reflects the total cash dividend or total interest distribution being reported for the NFN instrument.</p> <p>Funds may report the breakdown of cash dividends / interest distribution in the fields that follow.</p> <p>If not applicable, please submit "NA".</p>	Yes						
Total Cash Distribution Override	26	1		<p>Indicates if the system should ignore system validations associated with the Total Cash Distribution field. Allowable values:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)	No
Code	Definition										
#	Override On										
<space>	Override Off (Default)										
Non-Qualified Cash Distribution	27	12	\$\$\$\$\$ddddd	<p>Reflects the portion of the cash dividend or interest income that is taxed as ordinary income to the shareholder. Please note that this value should be entered as a dollar amount (not a percentage).</p> <p>If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".</p>	No						
Qualified Cash Distribution	39	12	\$\$\$\$\$ddddd	<p>Reflects the portion of the cash dividend or interest that is taxed as a qualified dividend to shareholder. Please note that this value should be entered as a dollar amount (not a percentage).</p>	No						

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required
				If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	
Tax-Free Cash Distribution	51	12	\$\$\$\$\$ddddd	Reflects the portion of the cash dividend or interest attributable to bonds that is not taxed to the shareholder. Please note that this value should be entered as a dollar amount (not a percentage). If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No
Ordinary Foreign Tax Credit	63	12	\$\$\$\$\$ddddd	Reflects the portion of the cash dividend or interest from a foreign corporation that is not "qualified" by the IRS. Please note that this value should be entered as a dollar amount (not a percentage). If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No
Qualified Foreign Tax Credit	75	12	\$\$\$\$\$ddddd	Reflects the portion of the cash dividend or interest attributable to qualified foreign corporation as defined by the IRS. Please note that this value should be entered as a dollar amount (not a percentage). If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	No
Stock Dividend Ratio	87	10	\$\$\$\$ddddd	Indicates the stock split/dividend ratio. Examples: <ul style="list-style-type: none"> • 2-for-1 stock split should be reported as "0002.000000". • 1-for-2 reverse stock split should be reported as "0000.500000". • 10% stock dividend would be reported as "0001.100000". If unavailable, please submit "NA". If space filled, Nasdaq will populate the field as "NA".	Yes
Stock Dividend Override	97	1		Indicates if the system should ignore validations on the stock dividend fields. Allowable values:	No

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required								
				<table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>#</td> <td>Override On</td> </tr> <tr> <td><space></td> <td>Override Off (Default)</td> </tr> </tbody> </table>	Code	Definition	#	Override On	<space>	Override Off (Default)			
Code	Definition												
#	Override On												
<space>	Override Off (Default)												
Payment Date	98	8	MMDDYYYY	<p>Indicates the payment date for a dividend or income interest.</p> <p>If no payment date, please submit "NA".</p>	Yes								
Record Date	106	8	MMDDYYYY	<p>Indicates the record date for a dividend or income interest. Indicates the record date for the distribution. Shareholders of the instrument as of this date would receive the distribution.</p>	Yes								
Ex Date	114	8	MMDDYYYY	<p>Indicates the ex date for a dividend or distribution. This is the date that NAV should be adjusted.</p> <p><u>Note:</u> The NFN processing logic relies on the Ex-Date field for the NFN Data Service corporate action spin. If the Ex-Date field needs to be adjusted, Nasdaq recommends that firms cancel and re-enter the distribution record (rather than correcting the record).</p>	Yes								
Reinvest Date	122	8	MMDDYYYY	<p>Indicates the reinvestment date for dividend and/ or distribution.</p> <p>If no reinvestment, please submit "NA".</p>	Yes								
Action	130	1		<p>Indicates if the NFN dividend / distribution report is a new entry, corrected entry or cancelled entry. Allowable values are:</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>N</td> <td>New entry</td> </tr> <tr> <td>C</td> <td>Corrected entry</td> </tr> <tr> <td>X</td> <td>Cancelled entry</td> </tr> </tbody> </table> <p><u>Note:</u> Please enter the full record for cancelled and corrected entries.</p> <p>Because the NFN logic is based on the Symbol, Cash Distribution Type and Ex-date fields, Nasdaq highly recommends that firms enter a Fund ID, Cash Distribution</p>	Code	Definition	N	New entry	C	Corrected entry	X	Cancelled entry	Yes
Code	Definition												
N	New entry												
C	Corrected entry												
X	Cancelled entry												

Subscriber Requirements for CTCI Communications

Field	Offset	Length	Numeric Format	Description	Required
				Type or Ex-Date correction as two separate entries: a cancellation for the original entry plus a new entry with the corrected information.	
Currency	131	3		Indicates the ISO currency code associated with the NFN price-related fields. For this field, Nasdaq will use ISO 4217 currency alphabetic codes . For NFN 0050, if this field is space filled, Nasdaq will populate the value as assigned in the listing.	No
CUSIP	134	9		Indicates the unique security identifier as assigned by S&P CUSIP Bureau for NFN instrument. Note: This field must adhere to the basic CUSIP format - 9 alphanumeric characters (no special characters).	Yes

5.3 **MFUNDS System Status Request Message Text Layout**

Field Name	Contents
Function	2 alpha, = ST

5.4 **Group Update**

CTCI Subscribers have the ability to update several Fund NAVs with a single transmission, i.e., multiple NAVs between a header and trailer envelope. The entire message, including STX and ETX, may not exceed 1024 characters.

A carriage return line feed would follow each individual fund update.

Example of single fund update:

Header - Line 0 ... CR LF

Line 1 ... CR LF

Line 1a OTHER MFUND CR LF

LF (Blank Line required)

Text - Update Message Fund A CR LF

LF (Blank line required between text and trailer)

Trailer

Example of group fund update:

Header - Line 0 ... CR LF

Line 1 ... CR LF

Line 1a OTHER MFUND CR LF

LF (Blank Line required)

Text - Update Message Fund 1 CR LF

Update Message Fund 2 CR LF

Update Message Fund n CR LF

LF (Blank line required between text and trailer)

Trailer

6 NASDAQ FUND NETWORK CTCI OUTPUT MESSAGES

6.2 General

Output messages must conform to the computer interface format. Each message begins with a header as specified in the Nasdaq CTCI Switch specification document. This document is available for download from the CTCI product page on the NasdaqTrader.com website.

6.3 Accepted Message

A positive message level acknowledgment will be transmitted in response to each Fund Update. The message will contain the Standard Switch Output Header and Trailer envelope described in the Nasdaq CTCI Switch specification document. This document is available for download from the CTCI product page on the NasdaqTrader.com website. The text of the message is described below:

Line 1. - Optional 4 character firm ID of the entering firm.
CR LF - Required line delimiter

Line 2.
Accepted code - 3 numerics "000" indicating the message was accepted.
CR LF - Required line delimiter

Line 3. - Echo back of the message that was accepted.
CR LF - Required line delimiter

Line 4. - Branch ID/Sequence Number of original input message , if submitted.
CR LF - Required Line delimiter

6.4 Reject Messages

If the application cannot process a message received from the subscriber it will generate a Status Message for the originator that will indicate why the message was rejected. The Status Message will be received by the originator as the text portion of a Standard Switch Output Message. The Standard Switch Output Message format is described in the Nasdaq CTCI Switch specification document, and the text (Status Message) is described below.

Line 1: - This is an optional line that may contain the four-character ID of the entering firm or the ID of the firm the service bureau is acting for. If this option is used for multi-station lines, it will equal the four character ID associated with the station (select/poll address).
CR LF - Required line delimiter.

Line 2:
Category - This field identifies the message category and will contain "STATUS".
CR LF - Required line delimiter.

Subscriber Requirements for CTCI Communications

Line 3: This line will contain "(Reason for Rejection)". The reasons for rejection are defined in Section 8.0. All Reject messages will be prefixed by "REJ nnn - " where nnn is a numeric code associated with the reject.

E.g., **REJ 005 - INVALID FUNCTION CODE**

CR LF - Required line delimiter.

Line 4:

Branch Office/Seq No. - 1 to 4 character Branch Office Code and 1 to 4 numeric Branch Office Sequence number, which appeared on line 1 of the input message, if submitted.

CR LF - Required line delimiter.

Line 5: Will contain an echo of the rejected message.

CR LF - Required line delimiter.

Subscriber Requirements for CTCI Communications

7 Reject Messages

This section describes reject messages that are forwarded to the NFN CTCI client whenever an entry submitted by the client fails validations described by Nasdaq.

All Reject messages will be prefixed by "REJ nnn - " where nnn is a numeric code associated with the reject.

For the NFN 0040 and NFN 0050 versions, the standard reject codes will be as follows:

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All	All	All		103	NO FUND ACTIVITY ALLOWED	System unavailable - NFN valuation module is unavailable for all activity. NFN valuation module is temporarily unavailable for any and all activity.
Money Market Funds		\$\$, \$M	30 Day Day Yield	449	30 DAY YLD NOT NUMERIC OR NA	Invalid field format - 30 Day Yield. 30 Day Yield value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Money Market Funds		\$\$, \$M	30 Day Yield Date	341	30 DAY YLD DATE GREATER THAN TODAY	Invalid value - 30 Day Yield Date cannot be a future date. For NFN valuation module, the 30 Day Yield Date must be equal to or less than the NFN system date.
Money Market Funds		\$\$, \$M	30 Day Yield Date	342	30 DAY YLD DATE GREATER THAN 1 YR AGO	Invalid value - 30 Day Yield Date cannot be more than 365 days in the past. NFN limits historical data entry and price corrections to one year from system date.
Money Market Funds		\$\$, \$M	30 Day Yield Date	343	INVALID 30 DAY YLD DATE	Invalid field format - 30 Day Yield Date. If 30 Day Yield field is populated with numeric value, this Date field must be populated in MMDDYYYY format. If 30 Day Yield field is not populated, this field should be populated as NA or space filled.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Money Market Funds		\$\$, \$M	30 Day Yield Date	344	30 DAY YLD DATE MUST BE ACTUAL DATE	Invalid value - 30 Day Yield Date is not a valid calendar date. If entered as numeric value, 30 Day Date must be populated in MMDDYYYY format and reflect an actual calendar date.
Money Market Funds		\$\$, \$M	30 Day Yield Direction	450	30 DAY YLD DIR NOT DASH OR SPACE	Invalid field format - 30 Day Yield Direction. Yield direction value should be populated as "-" (Dash) or space. For positive or zero yield, field should be space filled. For negative yield, field should contain "-" (dash).
UITs - Debt	UD	MF	Accrued Interest	255	ACCRUED INTEREST NOT NUMERIC OR NA	Invalid field format - Accrued Interest value does not match specified field format. Accrued interest value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: In NFN 0040 version, this field is supported for UITs - Debt only. In NFN 0050 version, this field will also be supported for UITs - Equity, mutual funds, annuities and structured products.)
All		DI, DS	Action	368	INVALID ACTION	Invalid field format - Action. Required field for NFN 0050 version. Action value does not match specified format or field length. Allowable values are: "N" (New), "C" (Correction) or "X" (Cancellation).
All		DI, DS	Action	473	INVALID ACTION – DUPLICATE ENTRY	Invalid value - Action. Duplicate record needs to be marked as "C" (Correction) or "X" (Cancellation). Nasdaq received a previous record with same symbol, cash distribution type and ex-date via the NFN interface. Subsequent entries for this field combination must be marked as "C" (Correction) or "X" (Cancellation).

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All		DI, DS	Action	474	INVALID ACTION – NEW ENTRY	Invalid value - Action. No record on file to correct or cancel. Nasdaq did not receive any previous records with the same symbol, cash distribution type and ex-date via NFN interface to cancel or correct. To correct the symbol, cash distribution type and/or ex-date, firms must enter two records (a cancellation record for the original ex-date/symbol entry and a new record for the corrected ex-date/symbol entry).
Money Market Funds		\$\$, \$M	Average Life	441	AVG LIFE NOT NUMERIC OR NA	Invalid field format - Average Life. Required field in NFN 0050 version. Average life must be populated as three digit whole number (000 to 364) or as NA.
Money Market Funds		\$\$, \$M	Average Life	442	AVG LIFE MAY NOT EXCEED 364	Invalid value - Average life cannot exceed 365 days. Money markets, by definition, must have an average life of less than one standard year.
Money Market Funds	\$R	\$\$, \$M	Average Maturity	161	AVG MATURITY NOT NUMERIC OR NA	Invalid field format - Average Maturity. Required field. Average maturity must be populated as three digit whole number (000 to 364) or as NA.
Money Market Funds	\$R	\$\$, \$M	Average Maturity	112	AVG MATURITY MAY NOT EXCEED 364	Invalid value - Average maturity cannot exceed 365 days. Money markets, by definition, must have an average maturity of less than one standard year.
Money Market Funds		\$M	Calculation Time	451	CALCULATION TIME NOT PROPER FORMAT	Invalid field format – Calculation Time. Calculation Time must be reported in HHMMSS format: HH must be 00-24, MM must be 00 to 59, SS must be 00-59. Enter NA if value is not available.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
UITs - Debt and UITs - Equity	UD, UE		Capital Distribution	245	CAP DIST MAY NOT BE ZERO	Invalid value - Capital distribution cannot be zero. Capital Distribution cannot be zero. Enter NA if value is not available.
UITs - Debt and UITs - Equity	UD, UE		Capital Distribution	246	CAP DIST FNOTE D MISSING	Missing footnote code - Capital Distribution. Within UTE and UTD messages, firm must enter the footnote value "D" when reporting a Capital Distribution value.
UITs - Debt and UITs - Equity	UD, UE		Capital Distribution	257	CAP DIST NOT NUMERIC OR NA	Invalid field format - Capital Distribution. Capital Distribution value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI	Cash Distribution Type	461	INVALID CASH DIST TYPE	Invalid field format - Cash Distribution Type. Required field for NFN 0050 version. Cash Distribution Type value does not match specified format or field length. Allowable values are: "D" (Regular Dividend), "I" (Interest), "S" (Special Cash Dividend) or space (No cash distribution).
All		DI	Cash Distribution Type	475	CASH DIST TYPE MISMATCH	Invalid value - Cash Distribution Type does not match message contents. Value must be "D", "I" or "S" if Total Cash Distribution field is populated with numeric value. Value must be populated as "NA".
Mutual Funds and Annuities	MR		Cash Dividend	100	TOTAL CASH DIST/NAV RANGE	Validation parameter - Cash Dividend exceeds NAV percentage. Cash Dividend / Total Cash Distribution is greater than the system validation parameter. Enter # in override field to bypass validation logic.
Mutual Funds and Annuities	MR		Cash Dividend	145	TOTAL CASH DIST MAY NOT BE ZERO	Invalid value - Cash Dividend cannot be zero. Cash Dividend / Total Cash Distribution cannot be zero. Enter NA if value is not available.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds and Annuities	MR		Cash Dividend	146	TOTAL CASH DIST NOT NUMERIC OR NA	Invalid field format - Cash Dividend. Cash Dividend / Total Cash Distribution value does not match specified format or field length. Refer to NFN inbound file specification document for proper field format.
Mutual Funds and Annuities	MR		Cash Dividend	147	FOOTNOTE X/C.DIV	Missing footnote code - Cash Dividend. Within MFL message, firm must enter the footnote value "X" when reporting a Cash Dividend value. (Note: This error code is not supported for NFN 0050 version.)
Mutual Funds and Annuities	MR		Cash Dividend Override	148	TOTAL CASH DIST OVER NOT # OR BLANK	Invalid field format - Cash Dividend Override. Override field should be populated as "#" or space.
All		All	Currency	366	INVALID CURRENCY	Invalid field format - Currency. NFN system currently allows for ISO currency code associated with the NFN price-related fields. For this field, Nasdaq will use ISO 4217 currency alphabetic codes . For NFN 0050, if this field is space filled, Nasdaq will populate the value as assigned in the listing.
UITs – Debt	UD	MF	Current Yield	253	CURRENT YIELD NOT NUMERIC OR NA	Invalid field format - Current Yield. Current Yield value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: In NFN 0040 version, this field is supported for UITs - Debt only. In NFN 0050 version, this field will also be supported for UITs - Equity, mutual funds, annuities and structured products.)

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
UITs - Debt		MF	Current Yield Direction	425	CURRENT YLD DIR NOT DASH OR BLANK	Invalid field format - Current Yield Direction. Yield direction value should be populated as "-" (Dash) or space. For positive or zero yield, field should be space filled. For negative yield, field should contain "-" (dash). While Current Yield is typically associated with UITs - Debt, Nasdaq will also support field for UITs - equity, mutual funds, annuities and structured products.
All		All	CUSIP	332	CUSIP MUST BE 9 ALPHANUM BYTES	Invalid field format - CUSIP. Required field. CUSIP must be entered as a 9-byte alphanumeric value (with no spaces or special characters).
All		MF, \$\$, \$M	Daily Dividend Adjustment Indicator	374	INVALID DAILY DIV ADJUST IND	Invalid field format - Daily Dividend Adjustment Indicator. If Daily Dividend field is populated with numeric value, this field should be populated as "Y" or "N". If Daily Dividend field is not populated, this field should be space filled.
All		MF, \$\$, \$M	Daily Dividend Factor	364	DAILY DIV/NAV RANGE	Validation parameter - Daily Dividend Factor exceeds NAV percentage. Daily Dividend is greater than the system validation parameter. Enter # in override field to bypass validation logic.
All		MF, \$\$, \$M	Daily Dividend Factor	372	DAILY DIV NOT NUMERIC OR NA	Invalid field format - Daily Dividend Factor. Daily Dividend value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		MF, \$\$, \$M	Daily Dividend Factor	373	DAILY DIV MAY NOT BE ZERO	Invalid value - Daily Dividend Factor cannot be zero. Daily Dividend value cannot be zero. Enter NA if value is not available.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Money Market Funds	\$R	\$\$, \$M	Effective Annualized Seven 7 Day Yield	165	ANNUALIZED YLD NOT NUMERIC OR NA	Invalid field format - Effective Annualized Seven 7 Day Yield. Effective Annualized Seven Day Yield value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Money Market Funds		\$\$, \$M	Effective Annualized Seven 7 Day Yield Direction	448	ANNUALIZED YLD DIR NOT DASH OR BLANK	Invalid field format - Effective Annualized Seven 7 Day Yield Direction. Yield direction value should be populated as "-" (Dash) or space. For positive or zero yield, field should be space filled. For negative yield, field should contain "-" (dash).
UITs - Debt		MF	ELTR Direction	426	ELTR DIR NOT DASH OR BLANK	Invalid field format - ELTR Direction. Yield direction value should be populated as "-" (Dash) or space. For positive or zero yield, field should be space filled. For negative yield, field should contain "-" (dash). (Note: While ELTR is typically associated with UITs - Debt, Nasdaq will also support field for UITs - equity, mutual funds, annuities and structured products in NFN 0050 version.)
All		All	Entry Date	214	ENTRY DATE NOT NUMERIC	Invalid field format - Entry Date. Required field in NFN 0050. Entry Date value does not match specified format or field length. Field must be entered in MMDDYYYY format.
All	All		Entry Date	214	ENTRY DATE NOT NUMERIC	Invalid field format - Entry Date. Entry Date value does not match specified format or field length. For NFN 0040 version, Nasdaq will allow data to be entered in MMDDYYYY format, NA or space filled. If user enters NA or spaces, Nasdaq will populate field on the outbound with current day's date.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All	All	All	Entry Date	215	INVALID ENTRY DATE	Invalid value - Entry date is not an actual calendar date. In NFN system, the entry date must be entered in MMDDYYYY format. Nasdaq validates that the Entry Date is an actual calendar date.
All	All	All	Entry Date	216	ENTRY DATE GREATER THAN TODAY	Invalid value - Entry date is greater than NFN system date. For NFN valuation module, the Entry Date must be equal to or less than the NFN system date. Firms should use the Record Date, Payment Date, Ex Date and Reinvestment Date fields within the Dividend/Interest and Capital Distribution message formats to relay corporate actions with future effective dates.
All	All	All	Entry Date	232	ENTRY DATE GREATER THAN 1 YR AGO	Invalid value - Entry date is more than 365 days in the past. NFN limits historical data entry and price corrections to one year from system date.
UITs - Debt	UD	MF	Estimated Long Term Return (ELTR)	254	ELTR NOT NUMERIC OR NA	Invalid field format - Estimated Long Term Return (ELTR). ELTR value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: In NFN 0040 version, this field is supported for UITs - Debt only. In NFN 0050 version, this field will also be supported for UITs - Equity, mutual funds, annuities and structured products.)
All		DI, DS	Ex Date	237	EX-DATE NOT NUMERIC	Invalid field format - Ex Date. Required field for NFN 0050. Ex-Date must be entered in MMDDYYYY format.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All		DI, DS	Ex Date	348	INVALID EX-DATE	Invalid value - Ex Date is not an actual calendar date. Ex-Date must be entered in MMDDYYYY format and represent an actual calendar date.
All	All	MF, \$\$, \$M	Footnotes	045	INVALID FOOTNOTE CODE	Invalid value - Footnote code not defined in NFN system. Footnote code is not an alphabetic character or is not a defined for current use in the NFN system.
All	All	MF, \$\$, \$M	Footnotes	050	DUPLICATE FOOTNOTE CODE	Invalid value - Footnote code duplicated. Duplicate footnote codes. Please check footnotes to validate that each code is entered only one time in flagged record.
All	All	MF, \$\$, \$M	Footnotes	129	INVALID FOR CATEGORY	Invalid value - Footnote code not supported for NFN fund type. Please refer to the field definition for allowable footnote codes by NFN fund type.
Money Market Funds		\$\$, \$M	Gross 7 Day Yield Direction	446	GROSS YLD DIR NOT DASH OR BLANK	Invalid field format - Gross 7 Day Yield Direction. Yield direction value should be populated as "-" (Dash) or space. For positive or zero yield, field should be space filled. For negative yield, field should contain "-" (dash).
Money Market Funds		\$\$, \$M	Gross Seven 7 Day Yield	444	GROSS YLD NOT NUMERIC OR NA	Invalid field format - Gross Seven 7 Day Yield. Required field in NFN 0050 version. Gross Seven Day Yield value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Money Market Funds		\$\$, \$M	Gross Seven 7 Day Yield	445	GROSS YLD CHANGE MORE THAN PARAMETER	Validation parameter- Gross Seven 7 Day Yield net change exceeded NFN validation parameter. Gross Seven Day Yield net change exceeded the system validation parameter. Enter # in override field to bypass validation logic.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Money Market Funds		\$\$, \$M	Gross Seven 7 Day Yield Override	447	GROSS YLD OVER NOT # OR BLANK	Invalid field format - Gross Seven 7 Day Yield Override. Override field can only be populated as "#" or space.
All		DS	Long Term Capital Gain	180	INVALID LT GAIN	Invalid field format - Long Term Capital Gain. Long Term Capital Gain value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DS	Long Term Capital Gain	486	LT GAIN MAY NOT BE ZERO	Invalid value - Long Term Capital Gain cannot be zero. Long Term Capital Gains cannot be zero. Enter NA if value is not available.
All		DS	Long Term Capital Gain	219	LT GAIN/NAV RANGE	Validation parameter - Long Term Capital Gain exceeds NAV percentage parameter. Long Term Capital Gain exceeds % of NAV system validation parameter. Enter # in override field to bypass validation logic.
Mutual Funds and Annuities	MR		Long Term Capital Gain	133	CAP GAIN DIST FNOTE D MISSING	Validation parameter- Missing footnote code for capital distribution. In NFN 0040 version, a firm is required to enter a footnote code of "D" when a numeric Long Term Gain (or Short Term Gain) value is entered.
Mutual Funds and Annuities	MR		Long Term Capital Gain	180	INVALID LT GAIN	Invalid field format - Long Term Capital Gain. Long Term Capital Gain value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Mutual Funds and Annuities	MR		Long Term Capital Gain	219	LT GAINS /NAV RANGE	Validation parameter - Long Term Capital Gain exceeds NAV percentage parameter. Long Term Capital Gain exceeds % of NAV system validation parameter. Enter # in override field to bypass validation logic.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All		DS	Long Term Capital Gain Override	181	LT GAINS OVER NOT # OR BLANK	Invalid field format - Long Term Capital Gain Override. Override field should be populated as "#" or space.
Mutual Funds and Annuities	MR		Long Term Capital Gain Override	181	LT GAINS OVER NOT # OR BLANK	Invalid field format - Long Term Capital Gain Override. Override field should be populated as "#" or space.
Mutual Funds (Closed End)	MR		Market Price	182	MARKET NOT NUMERIC OR NA	Invalid field format - Market Price. Market Price value does not match specified format or field length for the MR message format. See field definition for numeric format and allowable non-numeric values.
Mutual Funds (Closed End)	MR		Market Price	183	MARKET CHANGE MORE THAN 100%	Validation parameter - Market Price net change was greater than 100% on ex-date. On Ex-Date, NFN uses a net change parameter of 100% for Market Price validation. Firms must enter a footnote value of S, X or D to trigger this logic. Enter # in override field to bypass validation logic.
Mutual Funds (Closed End)	MR		Market Price	184	MARKET CHANGE MORE THAN PARAMETER	Validation parameter - Market Price net change exceeded percentage parameter. Market Price net change exceeded the system validation parameter. Please note that the Market Price validation uses the same % parameter as NAV and Offer Price. The standard % logic will be used unless there is a distribution footnote code in the message. Enter # in override field to bypass validation logic.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds (Closed End)	MR		Market Price	226	NOT OFFER AND MARKET	Invalid field format - Market Price and Offer Price cannot be reported in combination. For NFN 0040 version, firm should enter Offer Price for Open-End Mutual Funds and Annuities. Firm should enter Market Price for Closed-End Mutual Funds (ETFs) and Structured Products.
Mutual Funds and Annuities	MR		Market Price	227	OFFER NOT MARKET	Invalid value - Offer Price (not Market Price) field should be populated for Open End Funds and Structured Products. For NFN 0040 version, Nasdaq requires that Closed End Funds report Market Price values and Open End Funds and Annuities report Offer Price values. Fund ID would get this error if it were an Open End Fund or Annuity reporting a Market Price value.
Mutual Funds (Closed End)	MR		Market Price Override	185	MARKET PRICE OVER NOT # OR BLANK	Invalid field format - Market Price Override. Override field should be populated as "#" or space.
All	All	All	Symbol (pka Fund ID)	066	FUND ID IS NOT VALID	Invalid value -- NFN Symbol Fund ID not found. NFN Symbol Fund ID is not recognized by NFN system. Refer to NFN Symbol Directory for active Fund IDs.
All	All	All	Symbol (pka Fund ID)	078	MMID NOT IN FUND	Entitlement Error - NFN Symbol Fund ID not associated with MPID. Firm is not listed in NFN system as being the pricing agent for this Fund ID. Contact NFN Operations for assistance.
All	All	All	Symbol (pka Fund ID)	126	FUND NOT ACTIVE	Invalid value -- NFN Symbol Fund ID not active in NFN system. Fund ID NFN Symbol is not active in NFN system. Contact NFN Operations for current status information.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All	All	MF, \$\$, \$M	Symbol (pka Fund ID)	130	INVALID FUNC/FUNDID COMB	<p>Invalid value -- NFN Symbol Fund ID not associated with supported instrument fund type / instrument category / fund type. For MR format, Fund ID must be registered as mutual fund or annuity to use format. For MF format, Fund ID must be registered as mutual fund, unit investment trust, annuity, structured product, alternative investment product, collective investment trust, managed account, separate account or hedge fund to use format.</p> <p>For \$R or \$\$ format, Fund ID must be registered as a money market fund to use format.</p>
All	All	All	N/A	004	TERMINAL NOT AUTHORIZED	<p>Entitlement error - Terminal not authorized for subscriber function. While user is authorized for NFN, he does <u>not</u> have the necessary access rights for the current NFN function. Contact NASDAQ Subscriber Services to update user profile.</p>
All	All	All	N/A	013	SYSTEM UNAVAILABLE	<p>System unavailable - NFN valuation module is unavailable for data entry. NFN valuation module is temporarily unavailable for data entry.</p>
All	All	All	N/A	063	INVALID PRI. MMID	<p>Entitlement error - Invalid MPID for pricing agent. Entitlement validation is handled at the NFN interface level. Please contact NFN Operations to confirm MPID. (Note: This error is supported for CTCI and FTP interfaces only.)</p>
All	All	All	N/A	125	TERMINAL NOT IN FUNDS	<p>Entitlement error - User is not entitled to enter data for MPID. Entitlement validation is handled at the NFN interface level. Please contact Nasdaq Subscriber Services to confirm user entitlement</p>

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
						set-up. (Note: This error is supported for CTCI interface only.)
All	All	All	N/A	127	MMID NOT ACTIVE	Entitlement error - MPID is not active in NFN system. Entitlement validation is handled at the NFN interface level. Please contact NFN Operations to confirm MPID.
All	All	All	N/A	131	NOT WITHIN ALLOW HRS	System unavailable - NFN valuation module is closed. NFN update cannot be processed because it was received outside of normal operational hours.
All	All	All	N/A	300	INCORRECT FILE DATE	Invalid value - File Date is not equal to NFN system date. NFN system will only process files in which the file date is equal to the NFN system date. Please note that firms should use the "Entry Date" within the individual NFN records to indicate historical data updates.
All	All	All	N/A	301	INVALID NFN VERSION	Invalid message format - NFN data format version number is not valid. As of June 13, 2011, the supported NFN versions are "0040" and "0050".
All		MF, \$\$, \$M	NAV Override	139	NAV OVER NOT # OR BLANK	Invalid field value - NAV Override. Override field can only be populated as "#" or space.
Mutual Funds and Annuities	MR	MF	NAV Override	139	NAV OVER NOT # OR BLANK	Invalid field value - NAV Override. Override field can only be populated as "#" or space.
All		MF, \$\$, \$M	Net Asset Value (NAV)	376	NAV MAY NOT BE ZERO	Invalid value - NAV cannot be zero. NAV cannot be zero. Enter NA if not available.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Money Market Funds		\$\$, \$M	Net Asset Value (NAV)	134	NAV NOT NUMERIC OR NA	Invalid field format - Net Asset Value (NAV) . Required field. Net Asset Value (NAV) does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Mutual Funds and Annuities	MR	MF	Net Asset Value (NAV)	138	NAV CHANGE GREATER THAN PARAMETER	Validation parameter - NAV net change exceeded NFN validation parameter. NAV net change exceeded the system validation parameter. The standard % logic will be used unless there is a distribution footnote code in the message. Enter # in override field to bypass validation logic.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts	MR	MF	Net Asset Value (NAV)	134	NAV NOT NUMERIC OR NA	Invalid field format - Net Asset Value (NAV) . Required field. NAV does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts,	MR	MF	Net Asset Value (NAV)	135	NAV GREATER THAN OFFER	Validation parameter - NAV is greater than Offer Price. The NAV must be equal to or less than the Offer Price value in the NFN valuation message. This validation logic is used for Open-End Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CITs, Managed

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Separate Accounts, Hedge Fund, Demand Deposit Accounts						Accounts, Separate Accounts, Hedge Funds, and Deman Deposit Accounts.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts	MR	MF	Net Asset Value (NAV)	137	NAV CHANGE GREATER THAN 100%	Validation parameter - NAV net change was greater than 100% on ex-date. On Ex-Date, NFN uses a net change parameter of 100% for NAV validation. Firms must enter a footnote value of S or X to trigger this logic. Enter # in override field to bypass validation logic.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF, \$\$, \$M	Net Asset Value (NAV)	138	NAV CHANGE GREATER THAN PARAMETER	Validation parameter - NAV net change exceeded NFN validation parameter. NAV net change exceeded the system validation parameter. The standard % logic will be used unless there is a distribution footnote code in the message. Enter # in override field to bypass validation logic.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
UITs - Debt and UITs - Equity		MF	Net Asset Value (NAV)	420	NAV NON-STANDARD FIELD FOR UITs	Invalid value - UITs should use Redemption Price field for daily reporting. NFN system expects UITs to report Redemption Price (rather than Standard NAV).
All		DI	Non-Qualified Cash Distribution	462	NON-QUAL DIST NOT NUMERIC OR NA	Invalid field format - Non-Qualified Cash Distribution. Non-Qualified Cash Distribution value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI	Non-Qualified Cash Distribution	463	NON-QUAL DIST/TOTAL CASH DIST	Validation parameter- Non-Qualified Cash Distribution cannot exceed Total Cash Distribution. NFN system does not allow the Non-Qualified Cash Distribution value to exceed the Total Cash Distribution value. Please verify amounts.
Mutual Funds (Closed End)	MR		Offer Price	228	MUST BE MARKET PRICE	Invalid value - Market Price (not Offer Price) field should be populated for Closed End Funds. For NFN 0040 version, Nasdaq requires that Closed End Funds report Market Price values and Open End Funds and Annuities report Offer Price values. Fund ID would get this error if it were a Closed End Fund or Structured Product reporting an Offer Price value.
Mutual Funds and Annuities	MR		Offer Price	136	OFFER VS NAV GREATER THAN PARAMETER	Validation parameter - Difference between NAV and Offer Price is more than allowable % parameter. NFN system expects that the difference between NAV and Offer Price will never exceed a set % parameter.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds and Annuities	MR		Offer Price	140	OFFER NOT NUMERIC OR NA	Invalid field format - Offer Price. Offer Price value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Mutual Funds and Annuities	MR		Offer Price	141	OFFER CHANGE GREATER THAN 100%	Validation parameter - Offer Price net change was greater than 100% on ex-date. On Ex-Date, NFN uses a net change parameter of 100% for Offer Price validation. Firms must enter a footnote value of S, X or D to trigger this logic. Enter # in override field to bypass validation logic.
Mutual Funds and Annuities	MR		Offer Price	142	OFFER CHANGE MORE THAN 100%	Validation parameter - Offer Price net change exceeded percentage parameter. Offer Price net change exceeded the system validation parameter. Please note that the Offer Price validation uses the same % parameter as NAV and Market Price. The standard % logic will be used unless there is a distribution footnote code in the message. Enter # in override field to bypass validation logic.
UITs - Debt and UITs - Equity	UD, UE		Offer Price	136	OFFER VS NAV GREATER THAN PARAMETER	Validation parameter - Difference between Redemption NAV / Redemption Price and Offer Price is more than allowable % parameter. NFN system expects that the difference between NAV and Offer Price will never exceed a set % parameter.
UITs - Debt and UITs - Equity	UD, UE		Offer Price	140	OFFER NOT NUMERIC OR NA	Invalid field format - Offer Price. Offer Price value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
UITs - Debt and UITs - Equity	UD, UE		Offer Price	141	OFFER CHANGE GREATER THAN 100%	Validation parameter - Offer Price net change was greater than 100% on ex-date. On Ex-Date, NFN uses a net change parameter of 100% for Offer Price validation. Firms must enter a footnote value of S, X or D to trigger this logic. Enter # in override field to bypass validation logic.
UITs - Debt and UITs - Equity	UD, UE		Offer Price	142	OFFER CHANGE MORE THAN PARAMETER	Validation parameter - Offer Price net change exceeded percentage parameter. Offer Price net change exceeded the system validation parameter. Please note that the Offer Price validation uses the same % parameter as NAV and Market Price. The standard % logic will be used unless there is a distribution footnote code in the message. Enter # in override field to bypass validation logic.
Mutual Funds and Annuities	MR		Offer Price	407	OFFER ONLY WITH NAV	Validation parameter – Offer needs to be reported with NAV. For mutual funds and annuities, NFN expects firms that firms to report NAV with Offer Price. NFN will return this error if a firm enters Offer Price as numeric value but NAV of “NA”.
UITs - Debt and UITs – Equity	UD, UE		Offer Price	429	OFFER ONLY WITH REDEMPTION	Validation parameter – Offer needs to be reported with Redemption NAV. For UITs, NFN expects firms that firms to report Redemption NAV with Offer Price. NFN will return this error if a firm enters Offer Price as numeric value but Redemption NAV of “NA”.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds and Annuities	MR		Offer Price Override	143	OFFER OVER NOT # OR BLANK	Invalid field format - Offer Price Override. Override field should be populated as "#" or space.
UITs - Debt and UITs - Equity	UD, UE		Offer Price Override	143	OFFER OVER NOT # OR BLANK	Invalid field format - Offer Price Override. Override field should be populated as "#" or space.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF	Offer/Market Price	401	OFF/MKT VS NAV GREATER THAN PARAMETER	Validation parameter - Difference between NAV and Offer/Market Price is more than allowable % parameter. In NFN 0050 version, this validation logic applies to all Mutual Funds, Unit Investment Trusts and Annuities. NFN system expects that the <u>absolute</u> difference between NAV and Offer Price will not exceed a set % parameter.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF	Offer/Market Price	402	OFF/MKT NOT NUMERIC OR NA	Invalid field format - Offer / Market Price. Required field. For NFN 0050 version, the Offer / Market Price value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF	Offer/Market Price	403	OFF/MKT CHANGE GREATER THAN 100%	Validation parameter - Offer / Market price net change was greater than 100% on ex-date. On Ex-Date, NFN uses a net change parameter of 100% for Offer / Market Price validation. Firms must enter a footnote value of S, X or D to trigger this logic. Enter # in override field to bypass validation logic.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF	Offer/Market Price	404	OFF/MKT CHANGE GREATER THAN PARAMETER	Validation parameter - Offer / Market Price net change exceeded percentage parameter. Offer / Market Price net change exceeded the system validation parameter. Please note that the Offer / Market Price validation uses the same % parameter as NAV. The standard % logic will be used unless there is a distribution footnote code in the message. Enter # in override field to bypass validation logic.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF	Offer/Market Price	406	OFF/MKT MAY NOT BE ZERO	Invalid value – Offer / Market Price. Offer / Market Price cannot be zero. Enter NA if not available.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF	Offer / Market Price	407	OFFER ONLY WITH NAV	Validation parameter – Offer needs to be reported with NAV. For mutual funds, annuities, structured products, AIPs, CITs, managed accounts, separate accounts, hedge funds, NFN expects firms that firms to report NAV with Offer / Market Price. NFN will return this error if a firm enters Offer / Market Price as numeric value but NAV of “NA”.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
UITs - Debt and UITs – Equity		MF	Offer / Market Price	429	OFFER ONLY WITH REDEMPTION	Validation parameter – Offer needs to be reported with Redemption Price. For UITs, NFN expects firms that firms to report Redemption Price with Offer Price. NFN will return this error if a firm enters Offer Price as numeric value but Redemption Price of “NA”.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF	Offer/Market Price Override	405	OFF/MKT OVER NOT # OR BLANK	Invalid field format - Offer / Market Price Override. Override field should be populated as "#" or space.
All		DI	Ordinary Foreign Tax Credit	468	ORD FOREIGN CREDIT NOT NUMERIC OR NA	Invalid field format - Ordinary Foreign Tax Credit. Ordinary Foreign Tax Credit value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI	Ordinary Foreign Tax Credit	469	ORD FOREIGN CREDIT/TOTAL CASH DIST	Validation parameter - Ordinary Foreign Tax Credit cannot exceed Total Cash Distribution. NFN system does not allow the Ordinary Foreign Tax Credit value to exceed the Total Cash Distribution value. Please verify amounts.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All		DI, DS	Payment Date	233	PAYMENT DATE NOT NUMERIC OR NA	Invalid field format - Payment Date. Payment Date value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI, DS	Payment Date	234	INVALID PAYMENT DATE	Invalid value - Payment Date is not an actual calendar date. If entered as numeric value, Payment Date must be enter in MMDDYYYY format and reflect an actual calendar date.
Mutual Funds and Annuities	MR		Payment Date	233	PAYMENT DATE NOT NUMERIC OR NA	Invalid field format - Payment Date. Payment Date value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Mutual Funds and Annuities	MR		Payment Date	234	INVALID PAYMENT DATE	Invalid value - Payment Date is not an actual calendar date. If entered as numeric value, Payment Date must be enter in MMDDYYYY format and reflect an actual calendar date.
UITs - Debt and UITs - Equity	UD, UE		Payment Date	247	PAYMENT DATE NOT NUMERIC OR NA	Invalid field format - Payment Date. Payment Date value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. Note: For NFN 0050, Nasdaq will use the same error code (233) for all NFN instruments.
UITs - Debt and UITs - Equity	UD, UE		Payment Date	249	INVALID PAYMENT DATE	Invalid value - Payment Date is not an actual calendar date. If entered as numeric value, Payment Date must be enter in MMDDYYYY format and reflect an actual calendar date. Note: For NFN 0050, Nasdaq will use the same error code (234) for all NFN instruments.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All		DI	Qualified Cash Distribution	464	QUAL CASH DIST NOT NUMERIC OR NA	Invalid field format - Qualified Cash Distribution. Qualified Cash Distribution value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI	Qualified Cash Distribution	465	QUAL CASH DIST/TOTAL CASH DIST	Validation parameter - Qualified Cash Distribution cannot exceed Total Cash Distribution. NFN system does not allow the Qualified Cash Distribution value to exceed the Total Cash Distribution value. Please verify amounts.
All		DI	Qualified Foreign Tax Credit	470	QUAL FOREIGN CREDIT NOT NUMERIC OR NA	Invalid field format - Qualified Foreign Tax Credit. Qualified Foreign Tax Credit value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI	Qualified Foreign Tax Credit	471	QUAL FOREIGN CREDIT/TOTAL CASH DIST	Validation parameter - Qualified Foreign Tax Credit cannot exceed Total Cash Distribution. NFN system does not allow the Qualified Foreign Tax Credit value to exceed the Total Cash Distribution value. Please verify amounts.
All		DI, DS	Record Date	235	RECORD DATE NOT NUMERIC OR NA	Invalid field format - Record Date. Record Date value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI, DS	Record Date	236	INVALID RECORD DATE	Invalid value - Record Date is not an actual calendar date. If entered as numeric value, Record Date must be entered in MMDDYYYY format and reflect an actual calendar date.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds and Annuities	MR		Record Date	235	RECORD DATE NOT NUMERIC OR NA	Invalid field format - Record Date. Record Date value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Mutual Funds and Annuities	MR		Record Date	236	INVALID RECORD DATE	Invalid value - Record Date is not an actual calendar date. If entered as numeric value, Record Date must reflect an actual calendar date.
UITs-Debt and UITs-Equities	UE, UD		Record Date	248	RECORD DATE NOT NUMERIC OR NA	Invalid field format - Record Date. Record Date value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. Note: For NFN 0050, Nasdaq will use the same error code (235) for all NFN instruments.
UITs-Debt and UITs-Equities	UD, UE		Record Date	250	INVALID RECORD DATE	Invalid value - Record Date is not an actual calendar date. If entered as numeric value, Record Date must reflect an actual calendar date. Note: For NFN 0050, Nasdaq will use the same error code (236) for all NFN instruments.
UITs - Debt and UITs - Equity	UD, UE		Redemption NAVPrice (pka Redemption NAV)	134	NAV NOT NUMERIC OR NA	Invalid field format - Redemption PriceNAV. For NFN 0040 version, Nasdaq uses the same error codes for NAV and Redemption NAVPrice. Redemption NAV Price does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: In NFN 0050 version, there are separate error codes for NAV and Redemption Price.)

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds, Annuities, Structured Products, AIPs, and NextShares		MF	Redemption Price	400	REDEMPTION NON-STANDARD FOR MF	Invalid value - Mutual Funds, Annuities, Structured Products and Alternative Investment Products should use NAV field for daily reporting. NFN system expects all asset classes except for UITs to report NAV (rather than Redemption Price).
UITs - Debt and UITs - Equity	UD, UE		Redemption Price (pka Redemption NAV)Redemption NAV	137	NAV CHANGE GREATER THAN 100%	Validation parameter - Redemption NAV Price net change was greater than 100% on ex-date. For NFN 0040 version, Nasdaq uses the same error codes for NAV and Redemption NAVPrice .
UITs - Debt and UITs - Equity	UD, UE		Redemption Price (pka Redemption NAV)Redemption NAV	138	NAV CHANGE GREATER THAN PARAMETER	Validation parameter - Redemption NAV Price net change exceeded NFN validation parameter. For NFN 0040 version, Nasdaq uses the same error codes for NAV and Redemption NAV Price. Redemption NAV Price net change exceeded the system validation parameter. The standard % logic will be used unless there is a distribution footnote code in the message. Enter # in override field to bypass validation logic.
UITs - Debt and UITs - Equity		MF	Redemption Price	421	REDEMPTION NOT NUMERIC OR NA	Invalid field format - Redemption Price. New code for NFN 0050 version. Redemption Price does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: In NFN 0040 version, firms would receive reject code 134 for this validation error.)

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
UITs - Debt and UITs - Equity		MF	Redemption Price	422	REDEMPTION CHANGE GREATER THAN 100%	Validation parameter - Redemption Price net change was greater than 100% on ex-date. New code for NFN 0050 version. On Ex-Date, NFN uses a net change parameter of 100% for Redemption Price validation. Firms must enter a footnote value of S, X or D to trigger this logic. Enter # in override field to bypass validation logic. (Note: In NFN 0040 version, firms would receive reject code 137 for this validation error.)
UITs - Debt and UITs - Equity		MF	Redemption Price	423	REDEMPTION CHANGE GR THAN PARAMETER	Validation parameter - Redemption Price net change exceeded NFN validation parameter. New code for NFN 0050 version. Redemption Price net change exceeded the system validation parameter. The standard % logic will be used unless there is a distribution footnote code in the message. Enter # in override field to bypass validation logic. (Note: In NFN 0040 version, firms would receive reject code 138 for this validation error.)
UITs - Debt and UITs - Equity		MF	Redemption Price	428	REDEMPTION GREATER THAN OFFER	Validation parameter – Redemption Price is greater than Offer Price. The Redemption Price must be equal to or less than the Offer Price value in the NFN valuation message. This validation logic is used for UITs only.
UITs - Debt and UITs – Equity	UD, UE		Redemption Price	427	REDEMPTION MAY NOT BE ZERO	Invalid value – Redemption Price. Redemption NAV Price cannot be zero. Enter NA if not available.
UITs - Debt and UITs – Equity	UD, UE		Redemption Price	427	REDEMPTION MAY NOT BE ZERO	Invalid value – Redemption Price. Redemption NAV Price cannot be zero. Enter NA if not available.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
UITs - Debt and UITs - Equity		MF	Redemption Price Override	424	REDEMPTION OVER NOT # OR BLANK	Invalid field format - Redemption Price Override. Override field should be populated as "#" or space. (Note: Mutual funds and annuities must populate field as "#" if they wish to report Redemption Price value.)
All		DI, DS	Reinvest Date	345	REINVEST DATE NOT NUMERIC OR NA	Invalid field format - Reinvest Date. Reinvest Date value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI, DS	Reinvest Date	346	INVALID REINVEST DATE	Invalid value - Reinvest Date is not an actual calendar date. If entered as numeric value, Reinvest Date must be entered in MMDDYYYY format and reflect an actual calendar date.
All		MF, \$\$, \$M	Reporting Type	370	INVALID REPORTING TYPE	Invalid field format - Reporting Type. Required field in NFN 0050. For Reporting Type, the allowable values are "I" (Intra-day) and "R" (end of day). Unless the fund family plans to price multiple times each day, it should enter "R".
Mutual Funds and Annuities	MR		Reserved / Other Term Gain	178	INVALID OTHER CAP GAIN	Invalid field format - Other Term Gains. As of June 13, 2011, Nasdaq will reject all other term gains values except NA.
Mutual Funds and Annuities	MR		Reserved / Other Term Gain	218	OTHER CAP GAINS DIST/NAV RANGE	Validation parameter - Other Term Gain exceeds NAV percentage parameter. As of June 13, 2011, Nasdaq will reject all other term gains values except NA. This error code will no longer be supported.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds and Annuities	MR		Reserved / Other Term Gain Override	179	OTHER CAP GAIN OVER NOT # OR BLANK	Invalid field format - Other Term Gains Override. Override field should be populated as "#" or space.
UITs – Debt	UD		Reserved / Par Value Per Unit	256	PAR VALUE NOT NUMERIC OR NA	Invalid field format - Par Value Per Unit. Par Value Per Unit value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: In NFN 0050 version, Nasdaq no longer supports this field on the daily valuation messages.)
All		DS	Return of Capital (ROC)	480	INVALID ROC	Invalid field format - Return of Capital (ROC). Return of Capital value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DS	Return of Capital (ROC)	481	ROC MAY NOT BE ZERO	Invalid value - Return of Capital (ROC) cannot be zero. Return of Capital cannot be zero. Enter NA if value is not available.
All		DS	Return of Capital (ROC)	483	ROC/NAV RANGE	Invalid value - Return of Capital (ROC) exceeds NAV percentage parameter. Please note that Nasdaq uses the same NAV % parameter for all capital distribution fields including ROC. Enter # in override field to bypass validation logic.
All		DS	ROC Override	484	ROC OVER NOT # OR BLANK	Invalid field format - ROC Override. Override field should be populated as "#" or space.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All	All	All	Row Header Function Code	005	INVALID FUNCTION CODE	Invalid value - Row header Function Code value is not defined for NFN 0040 or NFN 0050. Required field. For NFN 0040, the allowable row header Function Code values are: MR, \$R, UD and UE. For NFN 0050, the allowable row header Function Code values are: MF, \$\$, \$M, DI and DS.
All	All	All	Row HeaderFunction Code	121	INVALID FORMAT	Invalid message format - Data format does not match the row header value. Please refer to the NFN inbound file specification documents for data field layout and size.
All		DI	Row Header Function Code	362	WRONG LEN FOR DI MSG	Invalid message format - Wrong row message length for Dividends / Interest. The DI message length should be 143 bytes.
All		DS	Row Header Function Code	363	WRONG LEN FOR DS MSG	Invalid message format - Wrong row message length for Capital Distributions. The DS message length should be 109 bytes.
Money Market Funds		\$\$	Row Header Function Code	361	WRONG LEN FOR \$\$ MSG	Invalid message format - Wrong row message length for Valuation - Money Market Fund record. The \$\$ message length should be 134 bytes.
Money Market Funds		\$M	Row Header Function Code	452	WRONG LEN FOR \$M MSG	Invalid message format – Wrong row message length for Valuation – Money Market Fund with Calculation Time record. The \$R message format should be 140 bytes.
Money Market Funds	\$R		Row HeaderFunction Code	174	WRONG LEN FOR \$R MSG	Invalid message format - Wrong row message length for legacy Money Market Fund record. The \$R message length should be 45 bytes.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds and Annuities	MR		Row HeaderFunction Code	167	WRONG LEN FOR MR MSG	Invalid message format - Wrong row message length for legacy Valuation - Mutual Fund message format. The MR message length should be 114 bytes.
Mutual Funds, Annuities, Structured Products, AIPs, NextShares, CIT, Managed Accounts, Separate Accounts, Hedge Fund, Demand Deposit Accounts		MF	Row HeaderFunction Code	360	WRONG LEN FOR MF MSG	Invalid message format - Wrong row message length for new Valuation - Mutual Fund, UIT, Annuity message format. The MF message length should be 150 bytes.
UITs – Debt	UD		Row HeaderFunction Code	170	WRONG LEN FOR UD MSG	Invalid message format - Wrong row message length for UITs Debt (legacy) record. The UD message length should be 136 bytes.
UITs – Equity	UE		Row HeaderFunction Code	168	WRONG LEN FOR UE MSG	Invalid message format - Wrong row message length for UITs Equity (legacy) record. The UE message length should be 106 bytes.
All		DS	Short Term Capital Gain	217	ST GAIN/NAV RANGE	Validation parameter - Short Term Capital Gain exceeds NAV percentage parameter. Short Term Capital Gain exceeds % of NAV system validation parameter. Please note that Nasdaq uses the same % of NAV parameter for all Capital Distribution fields. Enter # in override field to bypass validation logic.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All		DS	Short Term Capital Gain	176	INVALID ST GAIN	Invalid field format - Short Term Capital Gain. Short Term Capital Gain value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DS	Short Term Capital Gain	485	ST GAIN MAY NOT BE ZERO	Invalid value - Short Term Capital Gain cannot be zero. Short Term Capital Gains cannot be zero. Enter NA if value is not available.
Mutual Funds and Annuities	MR		Short Term Capital Gain	217	ST GAIN/NAV RANGE	Validation parameter - Short Term Capital Gain exceeds NAV percentage parameter. Short Term Capital Gain exceeds % of NAV system validation parameter. Please note that Nasdaq uses the same % of NAV parameter for all Capital Distribution fields. Enter # in override field to bypass validation logic.
Mutual Funds and Annuities	MR		Short Term Capital Gain	176	INVALID ST GAIN	Invalid field format - Short Term Capital Gain. Short Term Capital Gain value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Mutual Funds and Annuities	MR		Short Term Capital Gain	133	CAP GAIN DIST FNOTE D MISSING	Validation parameter- Missing footnote code for capital distribution. In NFN 0040 version, a firm is required to enter a footnote code of "D" when a numeric Short Term Capital Gain (or Long Term Capital Gain) value is entered. (Note: Nasdaq will not support this error code in NFN 0050 version.)
All		DS	Short Term Capital Gain Override	177	ST GAIN OVER NOT # OR BLANK	Invalid field format - Short Term Capital Gain Override. Override field should be populated as "#" or space.

Subscriber Requirements for CTCI Communications

NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds and Annuities	MR		Short Term Capital Gain Override	177	ST GAIN OVER NOT # OR BLANK	Invalid field format - Short Term Capital Gain Override. Override field should be populated as "#" or space.
All		DI	Stock Dividend Override	460	STOCK DIV OVER NOT # OR BLANK	Invalid field format - Stock Dividend Override. Override field should be populated as "#" or space.
All		DI	Stock Dividend Ratio	153	STOCK DIV MAY NOT BE ZERO	Invalid value - Stock dividend ratio cannot be zero. Stock Dividend cannot be zero. Enter NA if value is not available.
All		DI	Stock Dividend Ratio	154	STOCK DIV NOT NUM OR NA	Invalid field format - Stock Dividend Ratio. Stock Dividend value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI	Stock Dividend Ratio	472	STOCK DIV GR THAN PARAMETERS	Validation parameter - Stock dividend ratio is outside validation parameters. In NFN 0050 version, Stock Dividend field will be subject to minimum and maximum validation parameters. Enter # in override field to bypass validation logic.
Mutual Funds and Annuities	MR		Stock Dividend Ratio	101	FOOTNOTE S / S.DIV	Validation parameter- Missing footnote code for stock dividend. In NFN 0040 version, a firm is required to enter a footnote code of "S" when a numeric Stock Dividend value is entered. (Note: Nasdaq will not support this error code in NFN 0050 version.)
Mutual Funds and Annuities	MR		Stock Dividend Ratio	153	STOCK DIV MAY NOT BE ZERO	Invalid value - Stock dividend ratio cannot be zero. Stock Dividend cannot be zero. Enter NA if value is not available.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Mutual Funds and Annuities	MR		Stock Dividend Ratio	154	STOCK DIV NOT NUM OR NA	Invalid field format - Stock Dividend Ratio. Stock Dividend value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Money Market Funds	\$R		Subsidized 7 Day Yield (pka Seven Day Yield)	162	SUBSIDIZED YLD NOT NUMERIC OR NA	Invalid field format - Seven Day Yield. Required field in NFN 0040 version. Seven Day Yield value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: For NFN 0050 version, this field was renamed Subsidized Seven Day Yield.)
Money Market Funds		\$\$	Subsidized 7 Day Yield Direction	443	SUBSIDIZED YLD DIR NOT DASH OR BLANK	Invalid field format - Subsidized 7 Day Yield Direction. Yield direction value should be populated as "-" (Dash) or space. For positive or zero yield, field should be space filled. For negative yield, field should contain "-" (dash).
Money Market Funds	\$R		Subsidized 7 Seven Day Yield	164	SUBSIDIZED YLD GR THAN PARAMETER	Validation parameter- Seven Day Yield net change exceeded NFN validation parameter. Seven Day Yield net change exceeded the system validation parameter. Enter # in override field to bypass validation logic.
Money Market Funds	\$R		Subsidized 7 Seven Day Yield Override	163	SUBSIDIZED YLD OVER NOT # OR BLANK	Invalid field format - Seven Day Yield Override. Override field can only be populated as "#" or space.
Money Market Funds		\$\$	Subsidized Seven 7 Day Yield	162	SUBSIDIZED YLD NOT NUMERIC OR NA	Invalid field format - Subsidized Seven 7 Day Yield. Required field in NFN 0050 version. Seven Day Yield value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
Money Market Funds		\$\$	Subsidized Seven 7 Day Yield	164	SUBSIDIZED YLD GR THAN PARAMETER	Validation parameter- Subsidized Seven 7 Day Yield net change exceeded NFN validation parameter. Subsidized Seven 7 Day Yield net change exceeded the system validation parameter. Enter # in override field to bypass validation logic.
Money Market Funds		\$\$	Subsidized Seven 7 Day Yield Override	163	SUBSIDIZED YLD OVER NOT # OR BLANK	Invalid field format - Subsidized Seven 7 Day Yield Override. Override field can only be populated as "#" or space.
All		DI	Tax Free Cash Distribution	466	TAX FREE DIST NOT NUMERIC OR NA	Invalid field format - Tax Free Cash Distribution. Tax Free Cash Distribution value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
All		DI	Tax Free Cash Distribution	467	TAX FREE DIST/TOTAL CASH DIST	Validation parameter - Tax Free Cash Distribution cannot exceed Total Cash Distribution. NFN system does not allow the Tax Free Cash Distribution value to exceed the Total Cash Distribution value. Please verify amounts.
All		DI	Total Cash Distribution	100	TOTAL CASH DIST/NAV RANGE	Validation parameter- Total Cash Distribution exceeds NAV percentage parameter. Total Cash Distribution is greater than the system validation parameter. Please note that NFN system uses the most recently entered NAV / Redemption Price for validation purposes. Enter # in override field to bypass validation logic.
All		DI	Total Cash Distribution	145	TOTAL CASH DIST MAY NOT BE ZERO	Invalid value - Total Cash Distribution cannot be zero. Cash Dividend / Total Cash Distribution cannot be zero. Enter NA if value is not available.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All		DI	Total Cash Distribution	146	TOTAL CASH DIST NOT NUM OR NA	Invalid field format - Total Cash Distribution. Cash Dividend / Total Cash Distribution value does not match specified format or field length. Refer to NFN inbound file specification document for proper field format.
UITs - Debt and UITs - Equity	UD, UE		Total Cash Distribution (pka Income Distribution)	241	INCOME DIST MAY NOT BE ZERO	Invalid value -- Total Cash Distribution / Income distribution cannot be zero. Income Distribution cannot be zero. Enter NA if value is not available.
UITs - Debt and UITs - Equity	UD, UE		Total Cash Distribution (pka Income Distribution)Income Distribution	242	INCOME DIST NOT NUM OR NA	Invalid field format -- Total Cash Distribution / Income Distribution. Income Distribution value does not match specified format or field length. Refer to NFN inbound file specification document for proper field format.
UITs - Debt and UITs - Equity	UD, UE		Total Cash Distribution (pka Income Distribution)Income Distribution	243	FOOTNOTE X/I.DIV	Missing footnote code -- Total Cash Distribution / Income Distribution. Within UTE and UTD messages, firm must enter the footnote value "X" when reporting an Income Distribution value.
All		DI	Total Cash Distribution Override	148	TOTAL CASH DIST OVER NOT # OR BLANK	Invalid field format - Total Cash Distribution Override. Override field should be populated as "#" or space.
UITs - Debt and UITs - Equity	UD, UE		Total Cash Distribution Override (pka Income Distribution Override)	244	INCOME DIST OVER NOT # OR BLANK	Invalid field format -- Total Cash Distribution Income Distribution Override. Override field can only be populated as "#" or space.
All		MF, \$\$	Total Net Assets (pka Assets)	371	TOTAL NET ASSETS LESS THAN PARAMETER	Validation parameter - Total Net Assets is less than dollar threshold parameter. Assets / Total Net Assets is less than the system validation

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
						parameter. Enter # in override field to bypass validation logic.
Mutual Funds, Money Market Funds, Annuities	MR, \$R	MF, \$\$	Total Net Assets (pka Assets)	166	TOTAL NET ASSETS NOT NUMERIC OR NA	Invalid field format - Total Net Assets does not match specified field format. Assets / Total Net Assets value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: In NFN 0050 version, UITs and structured products may also report Total Net Assets.)
Mutual Funds, Money Market Funds and Annuities	MR, \$R	MF, \$\$	Total Net Assets (pka Assets)	221	TOTAL NET ASSETS MAY NOT BE ZERO	Invalid value - Total New Assets cannot be zero. Assets / Total Net Assets cannot be zero. Enter NA if value is not available.
UITs, Structured Products, AIPs, and NextShares		MF	Total Net Assets (pka Assets)	166	TOTAL NET ASSETS NOT NUMERIC OR NA	Invalid field format - Total Net Assets does not match specified field format. Assets / Total Net Assets value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
UITs, Structured Products, AIPs, and NextShares		MF	Total Net Assets (pka Assets)	221	TOTAL NET ASSETS MAY NOT BE ZERO	Invalid value - Total New Assets cannot be zero. Assets / Total Net Assets cannot be zero. Enter NA if value is not available.
All		MF, \$\$	Total Net Assets Override (pka Assets Override)	375	TOTAL NET ASSETS OVER NOT # OR BLANK	Invalid field format - Total Net Assets Override. Override field can only be populated as "#" or space.
All		DS	Unallocated Distributions	186	UNALLOCATED DIST NOT NUM OR NA	Invalid field format - Unallocated Distributions. Unallocated Distributions value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.

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NFN Fund Type(s)	0040 Message Format(s)	0050 Message Format(s)	Field	Rej Code	Displayed Error Code	Description
All		DS	Unallocated Distributions	220	UNALLOCATED DIST MAY NOT BE ZERO	Invalid value - Unallocated Distributions cannot be zero. Unallocated Distributions cannot be zero. Enter NA if value is not available.
Mutual Funds and Annuities	MR		Unallocated Distributions	186	UNALLOCATED DIST NOT NUM OR NA	Invalid field format - Unallocated Distributions. Unallocated Distributions value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values.
Mutual Funds and Annuities	MR		Unallocated Distributions	220	UNALLOCATED DIST MAY NOT BE ZERO	Invalid value - Unallocated Distributions cannot be zero. Unallocated Distributions cannot be zero. Enter NA if value is not available.
UITs - Debt and UITs - Equity	UD, UE	MF	Wrap Price	252	WRAP PRICE NOT NUMERIC OR NA	Invalid field format - Wrap Price. Wrap Price value does not match specified format or field length. See field definition for numeric format and allowable non-numeric values. (Note: In NFN 0040 version, this field is supported for UITs only. In NFN 0050 version, this field will also be supported for mutual funds, annuities, structured products, AIPs, CITs, managed accounts, separate accounts, and hedge funds.)

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ALLOWABLE SUBSCRIBER ENTRY TIMES

NFN updates may be entered via CTCI during the following time periods:

8 a.m. to 8 p.m., Eastern Time (ET) on Nasdaq – U.S. market days

For a list of Nasdaq – U.S. market holidays, please refer to <http://www.nasdaqtrader.com/Trader.aspx?id=ReleaseScheduleDP>.

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APPENDIX A – TCP/IP Connection

This appendix describes how a subscriber can submit and receive messages to and from Nasdaq's Computer-to-Computer Interface (CTCI) using the TCP/IP protocol.

The information contained in this appendix is presented in a step-by-step sequence that describes what must be done to setup and to configure a TCP/IP connection with Nasdaq, how to establish a TCP/IP connection, what control messages and associated protocol must be supported for CTCI TCP/IP session management, and ultimately how to send and receive CTCI messages over a TCP/IP connection.

The document is organized as follows:

- The business of contacting Nasdaq and configuring how the subscriber will access Nasdaq through TCP/IP is discussed first under Setup and Testing.
- The basics of establishing a TCP/IP connection with Nasdaq are discussed in Establishing a TCP/IP Connection.
- The format of the CTCI TCP/IP Message is presented next in the CTCI TCP/IP Message Format. This format is used for sending and receiving the CTCI message itself and also for sending and receiving control messages necessary for session management.
- A discussion of session management follows in CTCI TCP/IP Session Management, followed by detailed descriptions and examples of each control message in Control Messages.
- Finally, the method and format for sending and receiving CTCI messages is described in Sending a CTCI Message, Receiving a CTCI Message, and CTCI Message Sequence Verification.

The subscriber should read this appendix in its entirety to ensure that the rules of the protocol and what the subscriber is required to do to use it are clearly understood prior to contacting Nasdaq for Setup.

Setup

Before attempting to establish a connection over TCP/IP, the subscriber must first contact Nasdaq to configure the connection. If necessary, more than one TCP/IP connection can be configured for the same subscriber. For each connection, Nasdaq will provide the subscriber with two pairs of IP Addresses and a Well Known Port to connect to. The same port is used for all four addresses. At the same time, the subscriber must provide Nasdaq with the IP Address that they will be connecting from when they establish the connection.

Please note that the four IP Addresses consist of a Primary address and an Alternate address for use in connecting to Nasdaq and a backup address pair for use in connecting to the Nasdaq Disaster Recovery (D.R.) site. Please see the section Retrying failed connection attempts for more details.

For each TCP/IP connection, a client profile must be established. This process involves assigning an agreed upon ten-character logon identifier and assigning meaning to the "logical channels" that the subscriber will use to exchange CTCI messages with Nasdaq. *Note: A method of encryption will be introduced in a future release.*

The logon identifier will be associated with the client's IP Address and the IP Addresses and Well Known Port the client should be connecting to. This information will be verified when the client establishes the connection and sends a Logon control message to Nasdaq.

Over one TCP/IP connection, a subscriber can submit and receive CTCI messages on behalf of up to 63 different users and/or device locations. Messages for each user or device location are kept separated from each other by assigning them each to their own logical channel. Together with Nasdaq, the subscriber

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assigns a logical channel number from 1 to 63 to each of the users or device locations that the subscriber will be submitting and receiving CTCI messages on behalf of.

Use of a logical channel is up to the subscriber. A logical channel may be used for sending-only, receiving-only or both. This is solely under control of the subscriber. Please note that a subscriber may establish multiple TCP sessions with Nasdaq over a single line if they choose to use Network Address Translation (NAT). Nasdaq will assign a unique Well Known Port for each session.

Testing

The Customer Subscriber Test System will be available, but the subscriber will have to connect to a different IP Address and Well Known Port from production. The subscriber should contact Nasdaq to obtain an IP Address and Well Known Port to connect to for testing. This means the subscriber must maintain the ability to dynamically connect to different sockets.

Establishing a TCP/IP Connection

The client (the subscriber) establishes a TCP/IP connection with the server (Nasdaq) by connecting to an IP Address and Well Known Port provided by Nasdaq, from the IP Address that the subscriber told Nasdaq they would be connecting from.

Note: The Nasdaq server follows the *Berkley Model* for establishing a socket connection.

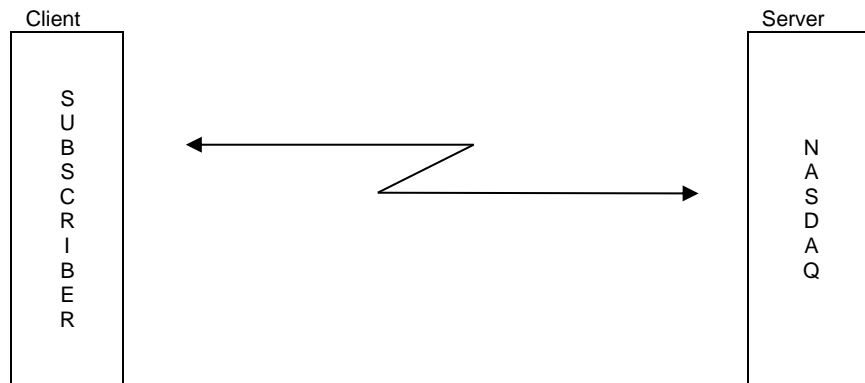
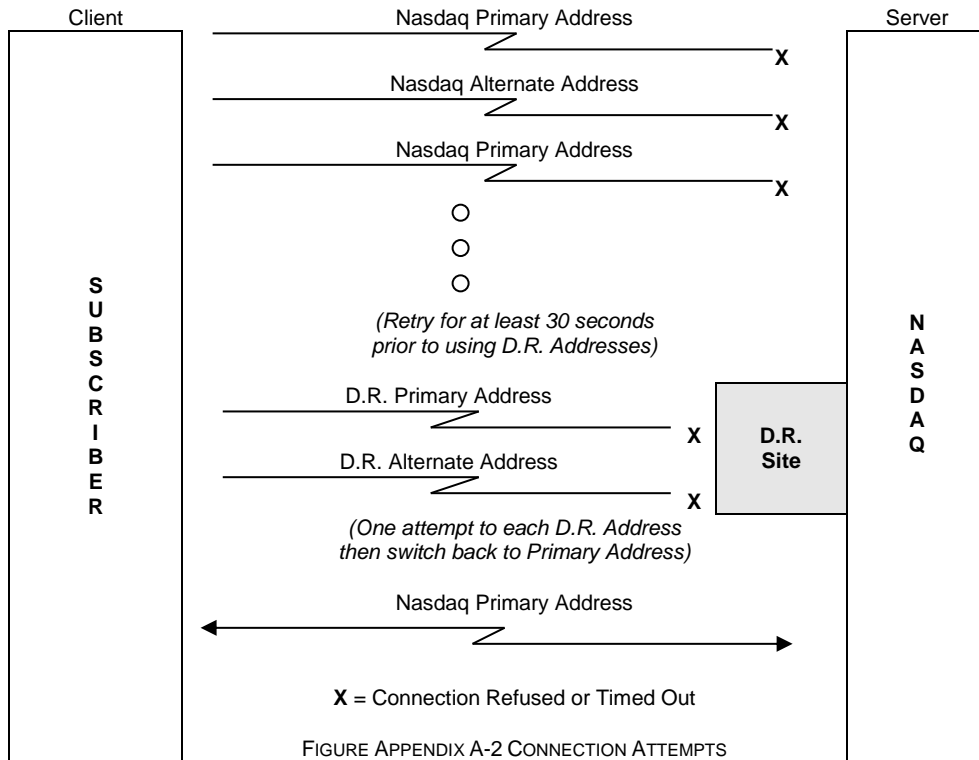


FIGURE APPENDIX A-1 CLIENT-SERVER TCP/IP CONNECTION

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Retrying failed connection attempts

The initial attempt to establish a TCP/IP connection should be to the Nasdaq Primary Address. If this attempt fails, the subscriber should delay briefly (3 seconds is recommended) and then try the Nasdaq Alternate Address. Subsequent attempts should alternate between the Primary and Alternate addresses until at least 30 seconds have elapsed. At that point the subscriber should make one attempt using the Disaster Recovery Primary Address, followed by one attempt to the Disaster Recovery Alternate Address. If a session still cannot be established, the entire cycle should begin again, starting with the Nasdaq Primary Address.



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CTCI TCP/IP Message Format

The CTCI TCP/IP Message is used for sending and receiving CTCI messages, as well as session management control messages. The CTCI TCP/IP Message consists of a message “envelope” and the CTCI or control message data.

When the CTCI TCP/IP Message contains CTCI message data it is referred to as a CTCI message, and when it contains a control message it is referred to by the name of the control message (Logon, Heartbeat Query, etc.). The format of the CTCI TCP/IP Message is as follows:

Message Length (2 bytes)	Version Number (2 bytes)	Transmission Time Stamp (8 bytes)	Logical Channel Number (1 byte)	CTCI or Control Message Data (1027 bytes max)	Sentinel “UU” (2 bytes)
-----Message Envelope-----				--Message Data--	-Message Envelope-

FIGURE APPENDIX A-3 CTCI TCP/IP MESSAGE FORMAT

The *Message Length* is a binary field that contains the total length (bytes) of the CTCI TCP/IP Message including the Message Length field at the beginning and the Sentinel field at the end. It is an unsigned integer in network byte order (NBO). Network byte order (NBO), also known as “big endian,” is one standard form for transmitting binary values (including integers) in a network message. Since it is used in all TCP/IP headers uniformly, without regard to originating or receiving platform, it is also adopted for use in the CTCI TCP/IP message protocol. Technically, the most arithmetically significant bit of each byte is transmitted first, followed in order of descending significance by the remaining bits; the most significant byte of each multi-byte binary field is transmitted first, followed in order of descending significance by the remaining bytes. If a 32-bit number is to be transmitted, and the bits are numbered 0-31 in order, left to right, where the 0th bit represents 231, and the 31st bit represents the least significant binary digit, i.e., 0 or 1.

Currently, the largest message that can be sent is 1042 bytes. The Message Length field is the “sentinel boundary” of the message. Data flow must begin on a sentinel boundary whenever a connection is established.

The *Version Number* contains a two-character ASCII string. The first character contains the integer portion of the version number and the second character contains the decimal portion of the version number. This is version 1.0 of the interface, so the value in the first byte will be one and the value in the second byte will be zero.

The *Transmission Time Stamp* is an ASCII numeric field containing the time the CTCI TCP/IP Message was transmitted in HHMMSSCC format.

The *Logical Channel Number* is a binary field that contains a value from zero through 63. If the logical channel number is zero, the CTCI TCP/IP Message is a control message. If the logical channel number is one through 63, the message is a CTCI message, and the logical channel number indicates which user or device location that the CTCI message belongs to.

CTCI or Control Message Data contains the CTCI or control message data. When the logical channel number is one through 63 it contains CTCI message data. When the logical channel number is zero, CTCI or Control Message Data contains the fields of one of the control messages described in the following pages.

The *Sentinel* is an ASCII field that always contains a constant of “UU”.

CTCI TCP/IP Session Management

The control messages – Logon, Logon Response, Heartbeat Query, Heartbeat Response, Flow Control, Logical Channel State Query, and Logical Channel State Response – are used for session management and

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will be sent over logical channel zero exclusively. The format, content, and further details about how each control message should be used is described in the pages that follow the session management discussion.

Once a socket connection is established, the very first thing the client must do is send a Logon control message to the server. The Logon Identifier field tells the server who the client is, the Logical Channel State fields tell the server on which logical channels the client is ready to receive CTCI messages. If the Logon fails, NASDAQ will break the connection. If the Logon is successful the server will send a Logon Response control message back to the client.

On the Logon Response control message the Logical Channel State fields tell the client on which logical channels the server is ready to receive CTCI messages. The client must not send CTCI messages to the server over any logical channel that is in not in a "ready to receive" state. If a logical channel is not in a "ready to receive" state, and the client sends CTCI messages over it to the server, the messages will be discarded.

Note: It is not necessary to verify that logical channel zero is ready to receive. This logical channel must always be in a "ready to receive" state, as there must always be a dedicated path open for control message exchange.

The client can now send CTCI messages over any logical channel that the server has indicated is ready to receive. If the client has no CTCI or control messages to be sent over any logical channel on a connection, or there are no logical channels (1-63) that server is ready to receive them on, the client must send a Heartbeat Query control message on logical channel zero every 10 seconds.

For logical channels that the server has indicated are not ready to receive, the client must wait until the server changes the logical channel state to ready to receive. The server will do this by sending the client a Flow Control message on logical channel zero.

In the event that the volume of CTCI message traffic over a logical channel becomes too much for a message receiver (client or server) to buffer and process, the message receiver can instruct the sender to suspend transmission on the logical channel by sending a Flow Control control message that places the logical channel in a "not ready to receive" state. When the receiver is ready to resume receiving messages on the logical channel again, the receiver sends a Flow Control control message that returns the logical channel to a "ready to receive" state.

At any time during the session, the client (or server) may request the state of a logical channel by sending a Logical Channel State Query Request to the server (or client). The server (or client) must respond with a Logical Channel State Query Response that informs the receiver whether the logical channel is in a "ready to receive", "not ready to receive" or "not configured" state.

The last two bytes of *every* CTCI TCP/IP Message received should always be checked for the sentinel character string of "UU". If the last two bytes are not equal to the sentinel, the TCP/IP connection is considered no longer reliable and should be terminated.

Control Messages

Logon and Logon Response

Once a socket connection is established, the client must first send a Logon control message to the server.

If the server does not recognize the Logon Identifier as being associated with the IP Address the client has connected from or does not recognize the Logon Identifier as being associated the IP Address and Well Known Port the client is connected to, it will terminate the connection. If the Logon is successful a Logon Response control message will be returned.

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Here is an example of a *Logon* control message sent on logical channel zero at 9:30 a.m.:

Message Length (2 bytes) Value: 92	Version Number (2 bytes) Value: 10	Transmission Time Stamp (8 bytes) Value: 09300000	Logical Channel Number (1 byte) Value: 0	Control Message Data (77 bytes)	Sentinel (2 bytes) Value: UU	
				Control Message Type (3 bytes) Value: LGQ	Logon Identifier (10 bytes) Value: ABCD	Logical Channel States (64 bytes) Values: 1,2,1,0,0...

FIGURE APPENDIX A-4 LOGON CONTROL MESSAGE, CHANNEL ZERO, 9:30 A.M.

In this example, the *Logical Channel Number* contains a value of zero, indicating the message is a control message.

The *Control Message Type* is an ASCII field that appears in every control message that indicates which control message is being sent. In this case “LGQ” represents Logon.

The *Logon Identifier* field is an ASCII field that must contain the logon identifier assigned during setup for use with the IP Address and Well Known Port. The value ABCD is shown just as an example.

In the *Logical Channel States* field, each byte contains a binary value that represents the state of a logical channel. The first byte contains the state of logical channel zero, the second the state of logical channel one, the third the state of logical channel three, up to the 64th byte that contains the state of logical channel 63. If the logical channel is ready to receive the value will be one. If it is not ready to receive the value will be 2. If the logical channel was not configured during Setup, the value will be zero.

In this example the value of the state of logical channel zero and two is one. The value of the state of logical channel one is two. The value of the state of logical channels three through 63 is zero. This means the client is ready to receive control messages on logical channel zero (always the case), not ready to receive CTCI messages on logical channel one, ready to receive CTCI messages on logical channel two, and the remaining logical channels are not configured.

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Here is an example of a *Logon Response* control message sent on logical channel zero at 2/100 of a second past 9:30 a.m.:

Message Length (2 bytes) Value: 82	Version Number (2 bytes) Value: 10	Transmission Time Stamp (8 bytes) Value: 09300002	Logical Channel Number (1 byte) Value: 0	Control Message Data (67 bytes)	Sentinel (2 bytes) Value: UU
				Control Message Type (3 bytes) Value: LGQ	Logical Channel States (64 bytes) Values: 1,2,1,0,0...

FIGURE APPENDIX A-5 LOGON RESPONSE CONTROL MESSAGE

In this example, the *Logical Channel Number* contains a value of zero, indicating the message is a control message.

The *Control Message Type* is an ASCII field that appears in every control message that indicates which control message is being sent. In this case “LGR” represents Logon Response.

In the *Logical Channel States* field, each byte contains a binary value that represents the state of a logical channel. The first byte contains the state of logical channel zero, the second the state of logical channel one, the third the state of logical channel three, up to the 64th byte that contains the state of logical channel 63. If the logical channel is ready to receive the value will be one. If it is not ready to receive the value will be 2. If the logical channel was not configured during Setup, the value will be zero.

In this example the value of the state of logical channel zero is one. The value of the state of logical channel one and two is one. The value of the state of logical channels three through 63 is zero. This means the server is ready to receive control messages on logical channel zero (always the case) and CTCI messages on logical channels one and two. The remaining logical channels are not configured.

Heartbeat Query and Response

The integrity of the data transfer connection must be constantly checked with the periodic exchange of client-issued Heartbeat Query and server-issued Heartbeat Response control messages.

If there are no other messages to be sent the client must send a Heartbeat Query every 10 seconds. The server does not require heartbeat queries during the 10-second interval if any properly formatted message has been received within the last 10 seconds, but will terminate the connection if no message is received for the duration of two, 10-second intervals.

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Here is an example of a *Heartbeat Query* control message sent on logical channel zero at 2 seconds past 9:30 a.m.:

Message Length (2 bytes) Value: 28	Version Number (2 bytes) Value: 10	Transmission Time Stamp (8 bytes) Value: 09300200	Logical Channel Number (1 byte) Value: 0	Control Message Data (13 bytes)	Sentinel (2 bytes) Value: UU
				Control Message Type (3 bytes) Value: HBQ	Comment Field (10 bytes) Value: Null

FIGURE APPENDIX A-6 HEARTBEAT QUERY CONTROL MESSAGE

In this example, the *Logical Channel Number* contains a value of zero, indicating the message is a control message.

The *Control Message Type* is an ASCII field that appears in every control message that indicates which control message is being sent. In this case “HBQ” represents Heartbeat Query.

The *Comment* field is an ASCII field that the client can use. Any data in it will be echoed back in the Comment field of the Heartbeat Response. The complete ASCII character set can be used. If the field is not used, it should be filled with ASCII nulls (binary zeros). In this example, there is no data in the Comment field, so it is filled with nulls.

Here is an example of a *Heartbeat Response* control message sent on logical channel zero at 2 and 2/100 seconds past 9:36 a.m.:

Message Length (2 bytes) Value: 28	Version Number (2 bytes) Value: 10	Transmission Time Stamp (8 bytes) Value: 09300202	Logical Channel Number (1 byte) Value: 0	Control Message Data (13 bytes)	Sentinel (2 bytes) Value: UU
				Control Message Type (3 bytes) Value: HBR	Comment Field (10 bytes) Value: Null

FIGURE APPENDIX A-7 HEARTBEAT RESPONSE CONTROL MESSAGE

In this example, the *Logical Channel Number* contains a value of zero, indicating the message is a control message.

The *Control Message Type* is an ASCII field that appears in every control message that indicates which control message is being sent. In this case “HBR” represents Heartbeat Response.

The *Comment* field is an ASCII field that contains the data sent by the client in the Comment field of the Heartbeat Query. In this example the field contains nulls, echoing this area of the input message.

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Flow Control

In the event that the volume of CTCI message traffic over a logical channel becomes too much for a message receiver (client or server) to buffer and process, the message receiver can instruct the sender to suspend transmission on the logical channel by sending a Flow Control message that places the logical channel in a “not ready to receive” state. When the receiver is ready to resume receiving messages on the logical channel again, the receiver sends a Flow Control message that returns the logical channel to a “ready to receive” state.

Note: Flow control of logical channel zero is not allowed, as there must always be a dedicated path open for control message exchange. Client processing of flow control messages from the Nasdaq server is mandatory. It is not mandatory, but strongly advised, that the client be designed with a mechanism to initiate flow control commands. Under no circumstance should the client ever stop reading the connection with a Nasdaq server while at the same time continuing to transmit data to the Nasdaq server.

Here is an example of a *Flow Control* message sent on logical channel zero at 1:30 p.m. that places logical channel one in a “not ready to receive” state:

Message Length (2 bytes) Value: 20	Version Number (2 bytes) Value: 10	Transmission Time Stamp (8 bytes) Value: 13300000	Logical Channel Number (1 byte) Value: 0	Control Message Data (77 bytes)	Sentinel (2 bytes) Value: UU	
				Control Message Type (3 bytes) Value: FLO	Target Logical Channel Number (1 bytes) Value: 1	Flow State (1 byte) Value: 2

FIGURE APPENDIX A-8 FLOW CONTROL MESSAGE

In this example, the *Logical Channel Number* contains a value of zero, indicating the message is a control message.

The *Control Message Type* is an ASCII field that appears in every control message that indicates which control message is being sent. In this case “FLO” represents Flow Control.

The *Target Logical Channel Number* is a binary field that contains a value from one through 63 and indicates which logical channel should be affected. In this example, logical channel one is being affected.

The *Flow State* field is a binary field that changes the state of a logical channel to ready to receive or not ready to receive CTCI messages. A value of one changes the state to ready to receive. A value of two changes the state to not ready to receive. In this case the value is two, changing the state of the logical channel to “not ready to receive” CTCI messages.

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Logical Channel State Query and Response

The client or server can request the state of a particular logical channel by sending a Logical Channel State Query control message over logical channel zero. A Logical Channel State Response must be sent back by the query recipient.

Here is an example of a *Logical Channel State Query* control message requesting the state of logical channel one, sent on logical channel zero at 23 and 85/100 seconds past 1:45 p.m.:

Message Length (2 bytes) Value: 28	Version Number (2 bytes) Value: 10	Transmission Time Stamp (8 bytes) Value: 13452385	Logical Channel Number (1 byte) Value: 0	Control Message Data (13 bytes)	Sentinel (2 bytes) Value: UU
		Control Message Type (3 bytes) Value: LCQ	Target Logical Channel Number (1 bytes) Value: 1	Unused (1 byte) Value: Null	Comment (8 bytes) Value: Nulls

FIGURE APPENDIX A-9 LOGICAL CHANNEL STATE QUERY CONTROL MESSAGE

In this example, the *Logical Channel Number* contains a value of zero, indicating the message is a control message.

The *Control Message Type* is an ASCII field that appears in every control message that indicates which control message is being sent. In this case “LCQ” represents Logical Channel State Query.

The *Target Logical Channel Number* is a binary field that contains a value from one through 63 and indicates for which logical channel the state is being requested. In this example the state of logical channel one is being requested.

The *Unused* field is an ASCII field that should always be filled with ASCII nulls (binary zeros).

The *Comment* field is an ASCII field that the message initiator can use. Any data present must be echoed back in the Comment field of the Logical Channel State Response. The complete ASCII character set can be used. If the field is not used, it should be filled with ASCII nulls (binary zeros).

Here is an example of a *Logical Channel State Response* control message returning the state of logical channel one, sent on logical channel zero at 24 seconds past 1:45 p.m.:

Message Length (2 bytes) Value: 28	Version Number (2 bytes) Value: 10	Transmission Time Stamp (8 bytes) Value: 13452400	Logical Channel Number (1 byte) Value: 0	Control Message Data (13 bytes)	Sentinel (2 bytes) Value: UU
		Control Message Type (3 bytes) Value: LCR	Target Logical Channel Number (1 bytes) Value: 1	Logical Channel State (1 byte) Value: 2	Comment (8 bytes) Value: Nulls

FIGURE APPENDIX A-10 LOGICAL CHANNEL STATE RESPONSE CONTROL MESSAGE

In this example, the *Logical Channel Number* contains a value of zero, indicating the message is a control message.

The *Control Message Type* is an ASCII field that appears in every control message that indicates which control message is being sent. In this case “LCR” represents Logical Channel State Response.

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The *Target Logical Channel Number* is a binary field that contains a value from one through 63 and indicates for which logical channel the state is being reported. In this example, the state of logical channel one is being reported.

The *Logical Channel State* is a binary field that contains a value that represents the state of the logical channel. If the logical channel is ready to receive, the value will be one. If it is not ready to receive, the value will be 2. If the logical channel was not configured during Setup, the value will be zero. In this example the value is two, indicating logical channel is “not ready to receive” CTCI messages.

The *Comment* field is an ASCII field that must always contain the data sent in the Comment field of the Logical Channel State Query. In this example the field contains nulls because that’s what was sent in the query.

Sending a CTCI Message

The client should format a CTCI message as usual (refer to *Subscriber Requirements for Computer to Computer Interface Utilizing the NASDMS Switch*), but to deliver it over a TCP/IP connection it must be imbedded in a CTCI TCP/IP Message “envelope.”

Here is an example of a CTCI message 100 bytes long sent on logical channel 31 at 9:31 a.m.:

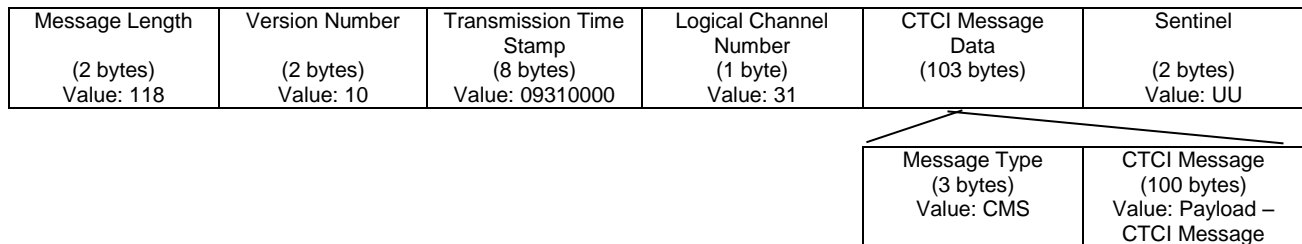


FIGURE APPENDIX A-11 CTCI MESSAGE

In this example, the *Logical Channel Number* contains a value of 31, in the range of one through 63, indicating that the message is a CTCI message.

The *Message Type* field is an ASCII field that should always have the value “CMS”. *CTCI Message* is the actual CTCI message itself, beginning with line zero, line two, etc., as described in *Subscriber Requirements for Computer to Computer Interface Utilizing the NASDMS Switch*. Do not include any control characters other than those specific the composition of the CTCI message (i.e. carriage return and line feed).

Receiving a CTCI Message

NASDAQ will send CTCI messages to subscribers using the same format as described above in Sending a CTCI Message. The *CTCI Message* field will include any user-specified header line(s) followed by line zero, line two, etc., through any user-specified trailer line(s).

CTCI Message Sequence Verification

It is the responsibility of the client to detect and recover lost data by implementing CTCI message sequence number checking and message retrieval processing. It is also the responsibility of the client to respond to gap fill requests from the server for lost or discarded client to server messages. Refer to *Subscriber Requirements for Computer to Computer Interface Utilizing the NASDMS Switch* for a detailed description of these procedures. Message sequence numbers continue to be the last part of the *CTCI Message* in *CTCI Message Data*.

APPENDIX B – IBM WebSphere MQ

The *CTCI WebSphere MQ V1.1 Subscriber Intercommunication Specification* describes how you can submit and receive CTCI messages using the NASDMS (Switch) through IBM WebSphere MQ Middleware using WebSphere MQ API calls over TCP/IP protocol. The document also describes the required CTCI-MQ intercommunication specifications. The CTCI-MQ Interface uses the WebSphere MQ Distributed Queuing technique. To access the document, please refer to the Nasdaq Trader website at <http://www.nasdaqtrader.com/Trader.aspx?id=MQSubscriber>.

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APPENDIX C - Version Control Information

Version	Date	Description of Document Change(s)
2002 – 1a	November 27, 2002	<ol style="list-style-type: none"> Denoted that footnote code for No- load fund should be considered “permanent” footnote. Added Appendix B, Version Control Information.
2008-1	December 2, 2008	<ol style="list-style-type: none"> Updated Mutual Fund message formats to support Assets as part of NFN release planned for 2009. Updated Money Market message formats to support uniform price field reporting and addition of Entry date field as part of NFN release planned for 2009. Updated references to reflect new corporate name – Nasdaq. Expanded the Communications, Standard Input, and Standard Output sections of the document to include the detailed CTCI interface information. Previously, Nasdaq referred to external documents in sections 2 to 4. Since the external documents were no longer available, Nasdaq integrated the CTCI communications information into the NFN specification document itself.
2008-1a	January 15, 2009	Updated document to reflect new release date for NFN version 0040. Date changed from February 9, 2009, to March 2, 2009.
2008-1b	January 21, 2009	Updated reject codes in Section 8 for release 0040.
2009-1	May 22, 2009	Updated document to reflect the new temporary price-related footnote codes to be supported for mutual funds and money market funds beginning July 2009.
2010-1	July 1, 2010	Updated the document to include the NFN 0050 data format release information. See NFN News #2010-4 for additional release details.
2010-1	September 27, 2010	<ol style="list-style-type: none"> Updated the release date for NFN 0050. Corrected definition for seven day yield fields to reflect proper NFN 0040 to NFN 0050 mapping.
2010-1	October 25, 2010	Corrected field format for selected fields within NFN 0050 data formats for Money Market Funds and Dividends/Interest to show that the decimal point is implied on CTCI. Also corrected offsets for the affected message formats.
2010-1	January 14, 2011	<ol style="list-style-type: none"> Updated release date for NFN 0050. Fixed offsets for two legacy NFN 0040 message formats. Corrected the values for the “Reporting Type” field in the NFN 0050 Money Market Fund Valuation (\$\$) message format. Updated NFN error codes for NFN 0050 release.
2010-1	February 11, 2011	<ol style="list-style-type: none"> Added the following guidance on field formatting for NFN 0050.

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Version	Date	Description of Document Change(s)
		<ul style="list-style-type: none"> ○ Numeric values must use the correct decimal placement and zero padding. Example: If a firm wanted to report a NAV of \$10.01 in NFN 0050 format, it would enter "000010.010000". ○ Text values must be left justified and space padded. Example: If a firm wanted to report NA for Offer/Market Price in NFN 0050 format, it would enter "NA " (NA followed by 11 spaces). ○ Dates must be entered as MMDDYYYY. Example: June 13, 2011 would be entered as "06132011". ○ CUSIP must be entered as 9 alphanumeric characters (with no spaces or special codes). <p>2 Added error codes for NFN 0040 and NFN 0050 versions.</p>
2010-1	February 23, 2011	1 Corrected error codes from Action field in matrix.
2010-1	March 11, 2011	<p>1 Based on customer input, Nasdaq changed format column in NFN 0050 table to reflect numeric values only.</p> <p>2 Added processing note about CUSIP validations in the NFN 0050 tables.</p>
2010-1	March 29, 2011	1 Removed extraneous error codes from CTCI document. Codes removed were 152 (Capital Distribution Override for UD and UE messages), 311 and 365 (Fund Type for MF, DI and DS messages), and 347 (Entry Date for DI and DS messages).
2010-1	April 12, 2011	1 Modified "displayed error code" text so that no message exceeds 40 characters.
2010-1	May 11, 2011	<p>1 Clarified the processing logic for following fields:</p> <ul style="list-style-type: none"> • Daily Dividend Adjustment Indicator in the MFU and MMF formats: Field should only be populated as Y or N if the Daily Dividend Factor field is populated with a numeric value. Please leave field blank if the Daily Dividend Factor field is populated as "NA". • Cash Distribution Type in DIV format: Field should be left blank if NFN pricing agent is only reporting a stock dividend. • Action in DIV and DST formats: Please enter the full record for cancelled and corrected entries. Because the NFN logic is based on the symbol and ex-date fields, Nasdaq highly recommends that firms enter Fund ID or Ex-Date correction as two separate entries: a cancellation for the original entry plus a new entry with the corrected information. <p>2 Removed code (367) for "incorrect footnote field length" from error code matrix.</p>

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Version	Date	Description of Document Change(s)
2010-1	May 16, 2011	1 Added NFN system parameter matrix to be consistent with other inbound specifications. See new Appendix D.
2010-1	May 18, 2011	1 Updated release date for NFN 0050 message Formats to June 13, 2011 (from May 23, 2011).
2010-1	May 19, 2011	1 Updated the Reporting Type field definition to clarify the processing of prior day corrections.
2011-1	July 8, 2011	1 Updated Footnote code matrix for NFN 0040 and NFN 0050 valuation messages to denote that the "F" footnote code is available for all instrument types.
2013-1	January 2, 2013	<p>1 Extended NFN 0040 conversion deadline to June 30, 2013.</p> <p>2 Added NFN code changes for Alternative Investment Product (AIP) release on or about March 11, 2013:</p> <ul style="list-style-type: none"> • Noted that AIPs must use NFN 0050 formats (MF, DI and DS) for price reporting. • Added Footnote code of "C" (Revaluation) for AIP and Structured Product use. <p>3 Corrected NAV and Redemption Price error codes for Structured Products. As outlined in the NFN 0050 data mapping document, Structured Products should report NAV (not Redemption Price).</p> <p>4 Removed outdated references as appropriate.</p>
2013-2	May 17, 2013	<p>1 Updated Daily Dividend Factor field format to denote that the inbound price format will be changed from \$\$\$\$\$ to \$\$\$\$\$\$ in the 3rd quarter of 2013. The Daily Dividend Factor field is included in the NFN 0050 Valuation message formats.</p> <p>2 Added new Cash Distribution Type of "S" for Special Cash Dividends. The Cash Distribution Type field is included in the NFN 0050 Dividend/Distribution message format.</p> <p>3 Extended NFN 0040 conversion deadline to December 31, 2013.</p>
2013-2	July 5, 2013	<p>1 Added note about structured product changes to be included in 3rd quarter 2013 release</p> <p>2 Added code release date of September 9, 2013.</p>
2013-2	July 24, 2013	<p>1 Added following new error codes to Section 7:</p> <p style="padding-left: 40px;">406 - OFF/MKT MAY NOT BE ZERO (NFN 0050, All Funds Except Money Markets)</p> <p style="padding-left: 40px;">427 - REDEMPTION MAY NOT BE ZERO (NFN 0050 – UITS only)</p> <p style="padding-left: 40px;">428 - REDEMPTION GREATER THAN OFFER (NFN 0050 – UITS only)</p> <p>2 Added note that the Dividend processing logic</p>

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Version	Date	Description of Document Change(s)												
		would be changed to use the combination of Symbol, Cash Distribution Type and Ex-Date for Action validation as part of the 3rd Quarter 2013 release.												
2013-2	August 9, 2013	1 Added following new error codes to Section 7: 407 – Offer only with NAV (Mutual Funds, Annuities, Structured Products, AIPs) 429 – Offer only with Redemption (UITs)												
2014-1	April 28, 2014	1 Added Test Symbol release information. 2 Updated field names to match NFN naming standards. 3 Extended NFN 0040 conversion deadline to September 30, 2014.												
2015-1	December 15, 2014	1 Added the following footnote codes to be supported in March 30, 2015: <table border="1" data-bbox="743 814 1406 1045"> <thead> <tr> <th>Code</th> <th>Definition</th> <th>Instrument Type</th> </tr> </thead> <tbody> <tr> <td>G</td> <td>Redemption Gate In Effect</td> <td>Money Market Fund</td> </tr> <tr> <td>L</td> <td>Liquidity Fee In Effect</td> <td>Money Market Fund</td> </tr> <tr> <td>I</td> <td>Repurchase Offer Period for Interval Fund</td> <td>Mutual Funds</td> </tr> </tbody> </table> 2 Extended NFN 0040 conversion deadline to June 30, 2015. (Note: Nasdaq will not add any new functionality to NFN 0040 during its limited life. Service is supported “as is”.)	Code	Definition	Instrument Type	G	Redemption Gate In Effect	Money Market Fund	L	Liquidity Fee In Effect	Money Market Fund	I	Repurchase Offer Period for Interval Fund	Mutual Funds
Code	Definition	Instrument Type												
G	Redemption Gate In Effect	Money Market Fund												
L	Liquidity Fee In Effect	Money Market Fund												
I	Repurchase Offer Period for Interval Fund	Mutual Funds												
2015-1	March 2, 2015	1 Updated release date for Footnote code release to April 13, 2015.												
2015-2	May 15, 2015	1 Updated NextShares symbology for NFN system to be seven-character ticker, consisting of Nasdaq’s exchange trading symbol and ending characters “NX”. 2 Added note that NFN system open time will be moved to 8:00 a.m., ET, with the September 2015 release. 3 Updated NextShares release date to Monday, September 14, 2015.												
2016-1	March 7, 2016	1 Added Money Market Fund with Calculation Time message format to be released on July 11, 2016. Also added two associated reject codes. 2 Denoted final retirement date for 0040 Money Market Fund message format of July 8, 2016.												
2017-1	March 30, 2017	1 Updated release notes to denote that two new Instrument Codes (Interval Fund and BDC) to be introduced in June 2017 will only be supported via NFN 0050 formats.												
2018-1	March 22, 2018	1 Updated currency code link.												
2018-4	May 18, 2018	1 Retired 0040 message format 2 Added Demand Deposit Accounts												

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APPENDIX D – Validation parameters for the NFN Valuation Module

(Note: This appendix is intended for informational purposes only. Nasdaq reserves the right to modify the validation parameters for the NFN system as market conditions dictate without advance notification.)

Price Validations	Definition	Value
NFN System Open Time	The NFN Valuation Module open time. (All entries entered before this time will be rejected.)	8:00 a.m., ET
NFN Close Time	The NFN Valuation Module close time. (All entries entered after this time will be rejected.)	8:00 p.m., ET
NAV / Redemption NAV	The net change percentage parameter for the NAV and Redemption NAV override prompts.	10.0%
Offer / Market Price	The net change percentage parameter for the offer / market price for override prompt.	10.0%
NAV vs. Offer/Market	The percent difference between NAV/Redemption NAV and Offer/Market fields for override prompt.	9.5%
Total Net Assets	The minimum total net asset amount for override prompt. New parameter for NFN 0050 only.	\$100,000
NAV (Money Market Funds)	The net change percentage parameter for NAV override prompts for money market funds.	10.0%
Subsidized 7 Day Yield and Gross 7 Day Yield for Money Market Funds	The net change percentage for Subsidized Yield and Gross Yield override prompts.	10.0%
Total Cash Distribution	The percentage of NAV for override prompt.	10.0%
Stock Dividend Ratio - Lower Level	The minimum stock dividend ratio before override prompt. New parameter for NFN 0050 only.	0.10 (One-for-ten reverse stock split ratio)
Stock Dividend Ratio - Higher level	The maximum stock dividend ratio before override prompt. New parameter for NFN 0050 only.	100 (100-for-one stock split ratio)
Short Term Capital Gains Distribution	The percentage of NAV for override prompt.	7.5%

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Price Validations	Definition	Value
Long Term Capital Gains Distribution	The percentage of NAV for override prompt.	7.5%
Return of Capital (ROC)	The percentage of NAV for override prompt.	7.5%