MARKET FEED
Currency Derivative Market Segment (CDS)
(LEVEL – 1, LEVEL – 2)

Version: 1.6

Date: 25 March 2025

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Revision History

Name	Description	Date
Version 1.0	New Specification Issued	12 February 2013
Version 1.1	Addition of fields in BOD – Master information	21 December 2018
Version 1.2	Contract Name mapping example	20 February 2019
Version 1.3	Removal of TCP/IP Session	29 October 2021
Version 1.4	Level 1 & Level 2 documents combined	02 July 2024
Version 1.5	Inclusion of question 7 in FAQs section	13 November 2024
Version 1.6	1. Removal of Time Stamp field from Online – Open Interest Information section 2. Updated the Size of Regular Lot and Tick Size field in EOD – Master Addition /Modification/Deletion	25 March 2025

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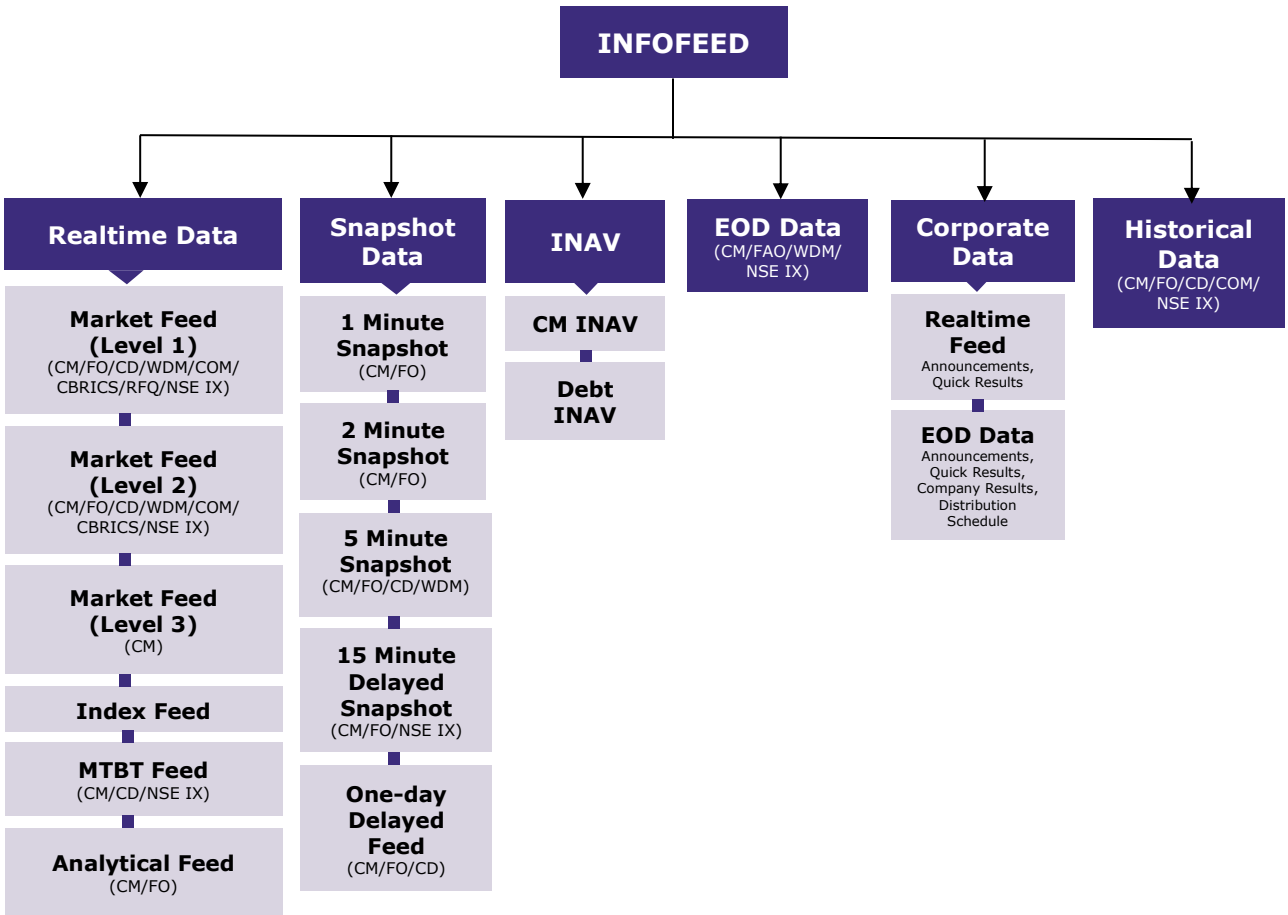
Market Feed – Currency Derivative Market Segment (Level 1 & Level 2)

1 Introduction

NSE Data & Analytics Ltd. disseminates NSEIL's real-time broadcast data to various information agencies. It provides six different types of data products viz.

1. Real Time Data
2. Snapshot Data
3. End of Day Data
4. Corporate Data
5. Analytical Products data
6. Historical Data
7. Indicative NAV Data

The real time data and corporate data is a packet broadcast available for dissemination through feed, whereas the snapshot data, end of day data and historical data is available in the form of files. All these data products come under Infofeed suite of applications.



In Infofeed's Real Time Data product following sub-products are available

1. Market Feed (CM/FO/CD/WDM/COM/CBRICS/RFQ/NSE IX Level 1)
2. Market Feed (CM/FO/CD/WDM/COM/CBRICS/NSE IX Level 2)
3. Market Feed (CM Level 3)
4. Index Feed
5. MTBT Feed (CM/CD/NSE IX)
6. Analytical Feed (CM/ FO)
7. Historical Data (CM/FO/CD/COM/NSE IX)

This document explains the NSE Market Feed for CD segment (Level 1 & Level 2) products. On real time basis, all the CD market update information is disseminated.

The infofeed clients connect to the multicast CD Market feed application through dedicated Leased Lines.

The feed consists of series of sequenced and unsequenced variable length compressed messages. The compression algorithm used over here is LZO – Compression.

2 Packet Format

Server sends all the packets in following format

```
typedef struct
{
        CHAR        cCompOrNot;
        SHORT       nDataSize;
        SHORT       iNoOfPackets;
}ST_COMP_BATCH_HEADER;

typedef struct
{
        SHORT       iCode;
        SHORT       iLen;
        LONG        lSeqNo;
} ST_INFO_HEADER;

typedef struct
{
        .
        .
}ST_DATA_INFO;

typedef struct
{
        SHORT       iCheckSum;
        CHAR        cEOT;
} ST_INFO_TRAILER;

typedef struct
{
        ST_INFO_HEADER stInfoHdr;
        ST_DATA_INFO stDataInfo;
        ST_INFO_TRAILER stInfoTrailer;
        .
}ST_DATA_PACKET;
```

All the packets received from server consist of compress batch header. Compress batch header gives the information about the data packet compressed or not, number of packets in the following data packet and the total size of data packet. Client needs to decompress the data packet using LZO decompression algorithm. After decompression each data packet consists of ST_INFO_HEADER, which has the iCode field to identify the type of the packet. Using iCode field, data info packet is mapped to the respective data packet.

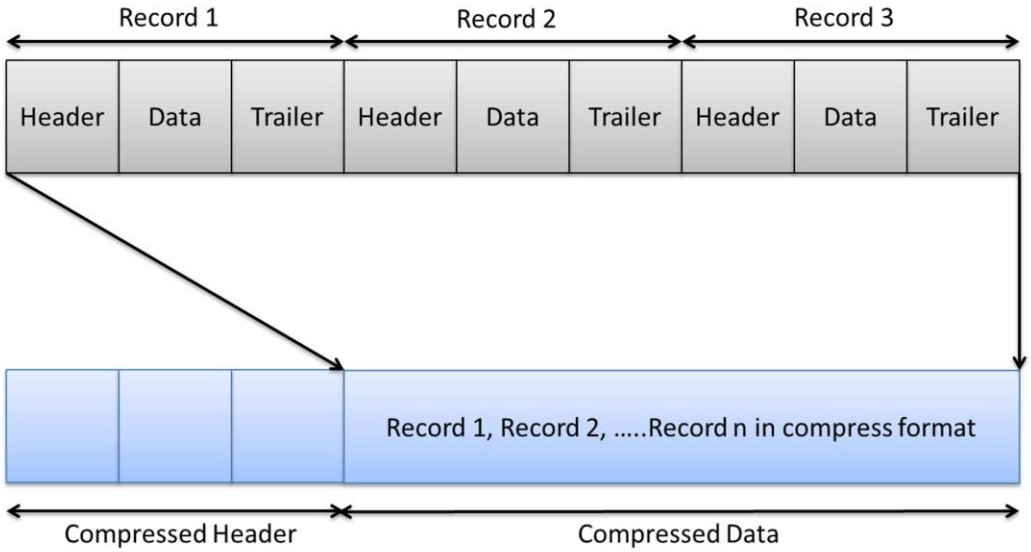
2.1 Data Types

Data types used in feed:

Data Type	Size In Bytes
CHAR	1
SHORT	2
INT	4
LONG	4
DOUBLE	8

Byte order - Big Endian

2.2 Diagrammatic Representation of Packet Format



Compressed Header

1. Compressed/ Uncompressed = 0 then compressed/ 1 uncompressed
2. Number of packets = Number of records in compressed data
3. Data Size = Compressed data size

As the data packets are sent in compressed format there is a need to decompress them. The compression algorithm used is LZO.

3 Session Messages

3.1 Heartbeat Message (Sent by server)

Heartbeat message will be sent every 2 seconds if data is not available.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DH'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	0(Zero) for heartbeat message
INFO DATA			
Not associated with any data			
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation Checksum is not calculated, so it is sent as 0(Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4 Sequenced Data Message (Sent by server)

Sequenced data messages are sent by server which contains the actual market data.

4.1 Contract Master Information

These packets are sent at the beginning of each trading day before market opens. This feed contains information about the contracts valid for trading.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DT'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Token Number	CHAR [10]	Character	Unique identifier for the securities listed on NSE.
Instrument Type	CHAR [6]	Character	Instrument Type
Symbol	CHAR [10]	Character	Contract symbol
Expiry Date	CHAR [11]	Character	Expiry Date
Strike Price	CHAR [10]	Character	Strike Price is applicable for options contract. For future contract, the strike price will be blank
Option Type	CHAR [2]	Character	Option Type is applicable for options contract. For future contract, the strike price will be blank
Delete Flag	CHAR [1]	Character	'Y' = Deleted 'N' = Not Deleted
Contract Name	CHAR [26]	Character	Contract Description
Regular Lot	CHAR [5]	Character	Regular Lot
Tick Size	CHAR [6]	Character	Contract Tick Size

Maturity Date	CHAR [11]	Character	Issue Maturity Date (DD-MM-YYYY)
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.2 Online - Market Status Message

This message is sent by the server, whenever the market status changes.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DO' 'DC'	'DO' = Normal market open 'DC' = Normal market close
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Market Type	CHAR [1]	Character	'N'=Normal Market Session
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation Checksum is not calculated, so it is sent as 0(Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.3 Online – Open Interest Information

This packet is sent during the trading hours, and it indicates the Open Interest of the various contracts traded.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DI'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence Number
INFO DATA			
Instrument Type	CHAR [6]	Character	Instrument Type
Symbol	CHAR [10]	Character	Symbol of the contract
Expiry Date	CHAR [11]	Character	Expiry Date
Strike Price	CHAR [10]	Character	Strike Price
Option Type	CHAR [2]	Character	Option Type
Open Interest	CHAR [10]	Character	Open Interest of the contract
Market Type	CHAR [1]	Character	'N'=Normal
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.4 Online - Normal Market Contract Update Information

NSE contract update information for normal market is sent through this Message. This market update is available only in level 1 feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DN'	'DN' = Normal market updates
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence Number
INFO DATA			
Instrument Type	CHAR [6]	Character	Instrument Type
Symbol	CHAR [10]	Character	Symbol of the contract
Expiry Date	CHAR [11]	Character	Expiry Date
Strike Price	CHAR [10]	Character	Strike Price
Option Type	CHAR [2]	Character	Option Type
Market Type	CHAR [1]	Character	'N' = Normal
Best Buy-Order price	CHAR [17]	Character	Best Buy side's outstanding Order Price
Best Buy-Order Quantity	CHAR [12]	Character	Best Buy side's outstanding Order Quantity
Best Sell-Order price	CHAR [17]	Character	Best Sell side's outstanding Order Price
Best Sell-Order quantity	CHAR [12]	Character	Best Sell side's outstanding Order Quantity
Last Traded Price (LTP)	CHAR [17]	Character	This is the price of the last trade occurred for the contract. If there are no trades for the day, then previous day's trade price is taken or the base price is taken.
Total Traded Quantity (TTQ)	CHAR [12]	Character	The traded volume for the day

Contract Status	CHAR [1]	Character	'S' = Suspended ' ' = Non-suspended
Opening Price	CHAR [17]	Character	Open price of the contract for the day.
High Price	CHAR [17]	Character	High price of the contract for the day
Low Price	CHAR [17]	Character	Low price of the contract for the day
Close Price	CHAR [17]	Character	Close price of the contract. During the day previous day's close price is sent. After market close current day's close price is calculated and sent through this field
Average Trade Price	CHAR [17]	Character	Weighted average price of the Contract (i.e. value / quantity)
Total Turnover	CHAR [25]	Character	Contract traded value i.e. Average Trade Price * TTQ
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.5 Online – Normal Market Contract 5 Depth Update

NSE contract update information for normal market is sent through this Message. This 5 Depth market update is available in level 2 feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DN'	'DN' = Normal market updates
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument Type	CHAR [6]	Character	Instrument Type
Symbol	CHAR [10]	Character	Symbol of the contract
Expiry Date	CHAR [11]	Character	Expiry Date
Strike Price	CHAR [10]	Character	Strike Price
Option Type	CHAR [2]	Character	Option Type
Market Type	CHAR [1]	Character	'N'=Normal
5 Depth Buy order details	MARKET_DEPTH_BUY_ORDER_INFO [5]	Structure	Refer the table given below MARKET_DEPTH_BUY_ORDER_INFO[5]
5 Depth Sell order details	MARKET_DEPTH_SELL_ORDER_INFO [5]	Structure	Refer the table given below MARKET_DEPTH_SELL_ORDER_INFO[5]
Last Traded Price (LTP)	CHAR [17]	Character	Price of the last trade happened on the contract. If no trade has happened for the day then previous day's trade price is taken, or the base price is taken.

Total Traded Quantity (TTQ)	CHAR [12]	Character	Volume traded today
Contract Status	CHAR [1]	Character	'S' = Suspended ' ' = Non-suspended
Opening Price	CHAR [17]	Character	Open price of the contract for the day.
High Price	CHAR [17]	Character	High price of the contract for the day
Low Price	CHAR [17]	Character	Low price of the contract for the day
Close Price	CHAR [17]	Character	During the trading hours previous day's close price is sent. After market close current day's close price is calculated and sent through this field
Average Trade Price	CHAR [17]	Character	Weighted average price of the contract. i.e. value / quantity
Total Buy Quantity	CHAR [12]	Character	Total quantity of the outstanding orders available on buy side
Total Sell Quantity	CHAR [12]	Character	Total quantity of the outstanding orders available on sell side
Total Turnover	CHAR [25]	Character	Contract traded value i.e. Average Trade Price * TTQ
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.6 Online - Spread Contract Update Information

NSE spread contract update information is sent through this Message.
This market update is available only in level 1 feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DP'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument Type_1	CHAR [6]	Character	Instrument Type
Symbol_1	CHAR [10]	Character	Symbol of the contract
Expiry Date_1	CHAR [11]	Character	Expiry Date
Strike Price_1	CHAR [10]	Character	Strike Price
Option Type_1	CHAR [2]	Character	Option Type
Instrument Type_2	CHAR [6]	Character	Instrument Type
Symbol_2	CHAR [10]	Character	Symbol of the contract
Expiry Date_2	CHAR [11]	Character	Expiry Date
Strike Price_2	CHAR [10]	Character	Strike Price
Option Type_2	CHAR [2]	Character	Option Type
Best Buy-Order Price-1	CHAR [17]	Character	Best buy side's outstanding orders price & quantity. information
Best Buy-Order Quantity-1	CHAR [12]	Character	
Best Sell-Order Price-1	CHAR [17]	Character	Best sell side's outstanding orders price & quantity. information
Best Sell-Order Quantity-1	CHAR [12]	Character	
Last Traded Price Difference (LTP)	CHAR [17]	Character	This field contains price difference of the latest spread trade.

Total Traded Quantity (TTQ)	CHAR [12]	Character	This field contains the total quantity of a contract traded on the current day
Opening Price Difference	CHAR [17]	Character	This field contains price difference of the first spread trade of the day.
Day High Price Difference	CHAR [17]	Character	This field contains maximum of the price difference of spread trades during the day.
Day Low Price Difference	CHAR [17]	Character	This field contains minimum of the price difference of spread trades during the day
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.7 Online – Spread Contract 5 Depth Update

NSE 5 depth spread contract update information is sent through this Message. This market update is available only in level 2 feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DP'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument Type_1	CHAR [6]	Character	Instrument Type of 1st contract
Symbol_1	CHAR [10]	Character	Symbol of 1st contract
Expiry Date_1	CHAR [11]	Character	Expiry Date of 1st contract
Strike Price_1	CHAR [10]	Character	Strike Price of 1st contract
Option Type_1	CHAR [2]	Character	Option Type of 1st contract
Instrument Type_2	CHAR [6]	Character	Instrument Type of 2nd contract
Symbol_2	CHAR [10]	Character	Symbol of the contract
Expiry Date_2	CHAR [11]	Character	Expiry Date of 2nd contract
Strike Price_2	CHAR [10]	Character	Strike Price of 2nd contract
Option Type_2	CHAR [2]	Character	Option Type of 2nd contract
5 Depth Buy Order details	MARKET_DEPTH_BUY_ORDER_INFO [5]	Structure	Refer the table given below MARKET_DEPTH_BUY_ORDER_INFO

5 Depth Sell Order details	MARKET_DEPTH_SELL_ORDER_INFO [5]	Structure	Refer the table given below MARKET_DEPTH_SELL_ORDER_INFO
Last Traded Price Difference (LTP)	CHAR [17]	Character	This field contains price difference of the latest spread trade.
Total Traded Quantity (TTQ)	CHAR [12]	Character	This field contains the total quantity of a contract traded on the current day
Opening Price Difference	CHAR [17]	Character	This field contains price difference of the first spread trade of the day.
Day High Price Difference	CHAR [17]	Character	This field contains maximum of the price difference of spread trades during the day.
Day Low Price Difference	CHAR [17]	Character	This field contains minimum of the price difference of spread trades during the day
Total Buy Quantity	CHAR [12]	Character	This field contains the total quantity of buy orders in a contract.
Total Sell Quantity	CHAR [12]	Character	This field contains the total quantity of sell orders in a contract.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

MARKET_DEPTH_BUY_ORDER_INFO[5]

Field Name	Data Type	Value	Brief Description
MARKET_DEPTH_SELL_ORDER_INFO[5]			
Best Buy-Order price	CHAR [17]	Character	Best 5 buy side's outstanding orders price, quantity
Best Buy-Order Quantity	CHAR [12]	Character	

MARKET_DEPTH_SELL_ORDER_INFO[5]

Field Name	Data Type	Value	Brief Description
MARKET_DEPTH_SELL_ORDER_INFO[5]			
Best Sell-Order price	CHAR [17]	Character	Best 5 sell side's outstanding orders price, quantity.
Best Sell-Order Quantity	CHAR [12]	Character	

4.8 Online - Broadcast Message

These packets consist of the messages broadcast during the Trading time containing market-related information.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DB'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER) (Variable length depending upon Message Length field of INFO DATA structure)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Message Code	CHAR [3]	Character	'NSE'
Message Length	CHAR [3]	Character	Broadcast Message Length
Message String	CHAR [239]	Character	Broadcast Message
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.9 EOD – Market Statistics (Bhavcopy)

The end of day status of the contracts is sent through these messages. After market close, this information is disseminated to client as the "End of Day" (EOD) feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DS'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER) (Variable length depending upon Message Length field of INFO DATA structure)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument	CHAR [6]	Character	Instrument Type
Symbol	CHAR [10]	Character	Contract symbol
Expiry Date	CHAR [11]	Character	Expiry Date
Strike Price	CHAR [10]	Character	Strike Price
Option Type	CHAR [2]	Character	Option Type
Market Type	CHAR [1]	Character	'N' = Normal
Opening Price	CHAR [17]	Character	Contract open price for the day
Trade High Price	CHAR [17]	Character	Contract high price for the day
Trade Low Price	CHAR [17]	Character	Contract low price for the day
Closing Price	CHAR [17]	Character	Contract close price for the day
Last Traded Price	CHAR [17]	Character	Contract last traded price for the day
Previous Close Price	CHAR [17]	Character	Contract previous day's close price

Settlement Price	CHAR [17]	Character	Contract settlement price for the day
Total Traded Quantity	CHAR [12]	Character	Total Volume traded today for the contract
Total Traded Value	CHAR [25]	Character	Total traded value for the contract
Open Interest	CHAR [10]	Character	Contract open interest
Change In Open Interest	CHAR [10]	Character	Contract change in open interest
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.10 EOD – Master Addition/Modification/Deletion

This packet consists of information about addition, modification, or deletion of any contracts. After market close, this information is disseminated to client as the "End of Day" (EOD) feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DA' 'DM' 'DD'	'DA' = Contract added 'DM' = Contract modified 'DD' = Contract deleted
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER) (Variable length depending upon Message Length field of INFO DATA structure)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Instrument	CHAR [6]	Character	Instrument Type
Symbol	CHAR [10]	Character	Contract symbol
Expiry Date	CHAR [11]	Character	Expiry Date
Strike Price	CHAR [10]	Character	Strike Price
Option Type	CHAR [2]	Character	Option Type
Contract Description	CHAR [30]	Character	Contract Name
Regular Lot	CHAR [5]	Character	Regular Lot
Market Type	CHAR [1]	Character	'N' = Normal
Tick Size	CHAR [9]	Character	Contract tick size
Maturity Date	CHAR [11]	Character	Contract Maturity Date (DD-MON-YYYY)
Last Update Date & Time	CHAR [20]	Character	Format: DD-MON-YYYY HH:MM:SS
INFO TRAILER			

Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

4.11 EOD – End of Feed Information

This end of the packet indicates that all the parts of EOD feed have been completed. Only once this message is sent through the Feed. After receiving this message clients can stop their application i.e. no new update information will be disseminated from the server.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'DE'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER) (Variable length depending upon Message Length field of INFO DATA structure)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Not associated with any data			
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation Checksum is not calculated, so it is sent as 0 (Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

5 Steps for Decompressing the Data Packets

5.1 LZO Algorithm Details

The LZO stands for Lempel Ziv Oberhaumer. It is a data compression library which is suitable for data Decompression in real-time. This means it favors speed over compression ratio.

LZO is written in ANSI C. Both the source code and the compressed data format are designed to be portable across platforms. This algorithm is freely available on the internet (URL: https://www.oberhumer.com/opensource/lzo/). It is made available by free software foundation. The algorithm is tested on various operating systems like UNIX and Red Hat Linux.

LZO implements several algorithms with the following feature

- Decompression is simple and *very* fast.
- Requires no memory for decompression.
- Requires 64 KB of memory for compression.
- Allows you to dial up extra compression at a speed cost in the compressor.
- The speed of the decompression is not reduced.
- Includes compression levels for generating pre-compressed data which achieve a quite competitive compression ratio.
- There is also a compression level which needs only 8 KB for Compression.
- Algorithm is thread safe.
- Algorithm is lossless.
- LZO supports overlapping compression and in-place decompression.

5.2 Files required for LZO algorithm

- Include files, source files (src) provided by LZO
- LZO.lib
- LZO library version used is 1.0.7

5.3 Decompression steps

Receive the packet in the temporary buffer i.e. array of characters.

The first field is compressed or decompressed.
The second field is the number of packets in the following data packet.
The third field is data packet length.

Use the following function of LZO to Decompress.

r = lzo1z_decompress ((lzo_byte*)cInputBuf, ipLength, (lzo_byte*)cOutputBuf, (lzo_uint*)&opLength, NULL);

lzo1z_decompress: Function which decompresses the data packet received
cInputBuf: Input buffer in which compressed data is received.
ipLength: The length of the packet which application has received using Receive ().
cOutputBuf: The uncompressed output data which is result of decompression.
opLength: Length of uncompressed data
After decompression data will be available in Output Buffer.

Each output data packet contains the INFO HEADER, after mapping the output decompressed buffer to INFO HEADER find out the data packet and the according to it map the output buffer to respective data packet.

Algorithm:

```
ST_NIFO_HEADER *pstInfoHeader;

for (i=0; i < iNoOfPackets; i++)          // iNoOfPackets received in
                                          // compressed data header
{
        pstInfoHeader = (ST_NIFO_HEADER   *) cOutputBuf

        switch (pstInfoHeader->iCode)
              {
                      case CB:        //Broadcast Message
                      {
                             ST_INDEX_DATA*stIndexData = (ST_INDEX_DATA *)cOutputBuf;
                             .
                             .
                             cOutputBuf = cOutputBuf +
                             sizeof(ST_INDEX_DATA); break;
                      }
               }
```

6 Checksum Calculation Algorithm

The Checksum routine followed for Info Vendor Feed is as follows:

```
// Following is the defines for checksum calculation

#define DC1          17
#define DC3          19
#define CR           13
#define LF           10
#define POLY       0x1021

// End of defines
check_sum (cData, iLength) char *cData;
int iLength;
{
        unsigned uAccum = 0;
        unsigned uData;
        unsigned char ucChk[2];
        int i,j;
        for (i=0;i<iLength;i++)
        {
                uData = *(cData+i);
                uData <<= 8;
                for(j=8; j>0 ;j--)
                {
                        if((uData^uAccum)&0x8000)
                                uAccum=(uAccum<<1)^POLY;
                        /* SHIFT AND SUBTRACT POLY */
                        else
                                uAccum<<=1;
                        uData<<=1;
                }
        }

        ucChk[0] = uAccum>>8;
        if (ucChk[0] == DC1 || ucChk[0] == DC3 || ucChk[0] == CR || ucChk[0] == LF )
                ucChk[0] -= 1;

        ucChk[1] = uAccum&0xFF;
        if (ucChk[1] == DC1 || ucChk[1] == DC3 || ucChk[1] == CR || ucChk[1] == LF )
                ucChk[1] -= 1;

        uAccum = ucChk[1];
        uAccum = (uAccum<<8) + ucChk[0];

        return(uAccum);
}
```

7 Contract Name Mapping Example

In DT messages four new fields are added and one of the fields is **"Contract Name"**
Examples of weekly & monthly options contracts will reflect in the contract name field as follows

Options monthly and weekly contracts examples

Contract Name	Tenor	Logic for contract Name					
USDINR18DEC72.75CE	Monthly	Symbol	YY	MON	Strike Price	Option Type	
USDINR18DEC72.75PE	Monthly	Symbol	YY	MON	Strike Price	Option Type	
USDINR18D1472.75CE	Weekly	Symbol	YY	M	DD	Strike Price	Option Type
USDINR18D1472.75PE	Weekly	Symbol	YY	M	DD	Strike Price	Option Type

Below is the Table of codes for months 'M' in weekly options contracts

Sr. No.	Month 'M'	Code
1	January	1
2	February	2
3	March	3
4	April	4
5	May	5
6	June	6
7	July	7
8	August	8
9	September	9
10	October	O
11	November	N
12	December	D

8 Annexure

8.1 Acronyms Used

BOD	Begin Of Day Information
EOD	End Of Day Information
ONLINE	Information Sent During Market Timing
CM	Cash Market
F&O	Future & Options Market
CD	Currency Derivatives Market
COM	Commodity Derivatives Market
CBRICS	Corporate Bond Reporting and Integrated Clearing System
WDM	Wholesale & Debt Market

9 FAQs

1) For Sequenced Data Messages, why do fields contain datatype as short, but contain value is specified as character?

   Data sent by server contains number, which is the ASCII value of the field and at client's end it needs to be converted from ASCII value into character.

2) How do you differentiate between numeric and non-numeric values?

   Numeric values are always right aligned and non-numeric values are left aligned. For instance, even though LTP has a datatype as character, it is distinguished by the alignment as numeric value is always right aligned.

3) How to decompress a packet and extract data from it?

   Follow the steps mentioned below.

   - Receive a packet from the feed, and check ST_COMP_BATCH_HEADER's cCompOrNot to see if the data is compressed or not.
   - if the cCompOrNot flag is '0' then the data is compressed so use LZO Decompress to extract the data. The position of data would be the difference in position between the received bytes and the ST_COMP_BATCH_HEADER size.
   - if the cCompOrNot flag not '0' then the data is not compressed so just copy the bytes after the header to get the data.
   - Type cast the data above data to ST_INFO_HEADER and get iCode from it. iCode can be used to identify the type of packet.
   - Based on iCode, map the data section into the required structure.
   - After the data section, map the trailer ST_INFO_TRAILER to get the iCheckSum i.e. checksum (Refer to section checksum calculation)

4) What is Level 1 and Level 2 Data?

   The list of market depth is organized by price levels, and it is updated in real-time to reflect current activity where:

   - Level 1 provides the best Bid and best Ask price.
   - Level 2 offers up to the best 5 Bids and Asks prices.

5) What structures are available for level 1 and level 2 feeds?

Packets Sent	Code	Level 1	Level 2
3.1 Heartbeat Message	'DH'	✔	✔
4.1 Contract Master Information	'DT'	✔	✔
4.2 Online - Market Status Message	'DO' 'DC'	✔	✔
4.3 Online – Open Interest Information	'DI'	✔	✔
4.4 Online – Normal Market Contract Update Information	'DN'	✔	-
4.5 Online – Normal Market Contract 5 Depth Update	'DN'	-	✔
4.6 Online – Spread Contract Update Information	'DP'	✔	-
4.7 Online – Spread Contract 5 Depth Update	'DP'	-	✔
4.8 Online - Broadcast Message	'DB'	✔	✔
4.9 EOD – Market Statistics (Bhavcopy)	'DS'	✔	✔
4.10 EOD – Master Addition/Modification/Deletion	'DA' 'DM' 'DD'	✔	✔
4.11 EOD – End of Feed Information	'DE'	✔	✔

7) Can we use lzo versions 2.03/2.09/2.10 for decompressing the packets received from NDAL?

Yes, lzo is backward compatible. Above versions of lzo can be used for decompressing the compressed packets disseminated from NDAL.

10 Support Information

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