



NSE

Data &
Analytics

MARKET FEED COMMODITY (LEVEL - 1, LEVEL - 2)

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Revision History

Name	Description	Date
Version 1.0	New Specification Issued	April 30, 2018
Version 1.1	<p>1) Addition of Settlement Price in Change in 5.7 EOD -Market information</p> <p>2) removal of Timestamp field from 5.3 ONLINE Market Update Information, 5.4 ONLINE – Spread Order Update Information, 5.5 ONLINE Open Interest Information.</p> <p>3) Removal of Contract name field from 5.7 EOD Market Information.</p> <p>4) addition of Total Buy Quantity and Total Sell Quantity field in 5.3 ONLINE - Market Update Information, 5.4 ONLINE – Spread Order Update Information</p>	September 27, 2018
Version 1.2	<p>1) Consolidation of Level - 1 and Level - 2 Specification</p> <p>2) Removal of TCP/IP Session Initialization chapter, Addition of Note for Multicast in 3. Session Messages</p> <p>3) Addition of TimeStamp field to: 4.3 ONLINE – Spread Order Update Information – Level 1, 4.4 ONLINE – Spread Order Update Information – Level 2, 4.5 ONLINE - Market Update Information – Level 1, 4.6 ONLINE - Market Update Information – Level 2, 4.7 ONLINE - Open Interest Information</p>	10 July, 2020
Version 1.3	Removal of TimeStamp field from Level 1 and Level 2 - Spread Order Update, Market Update and Open Interest Information	18 August, 2020

Version 1.4	1. Removal of TCP/IP formats, Login Request, Login Response.	29 October, 2021
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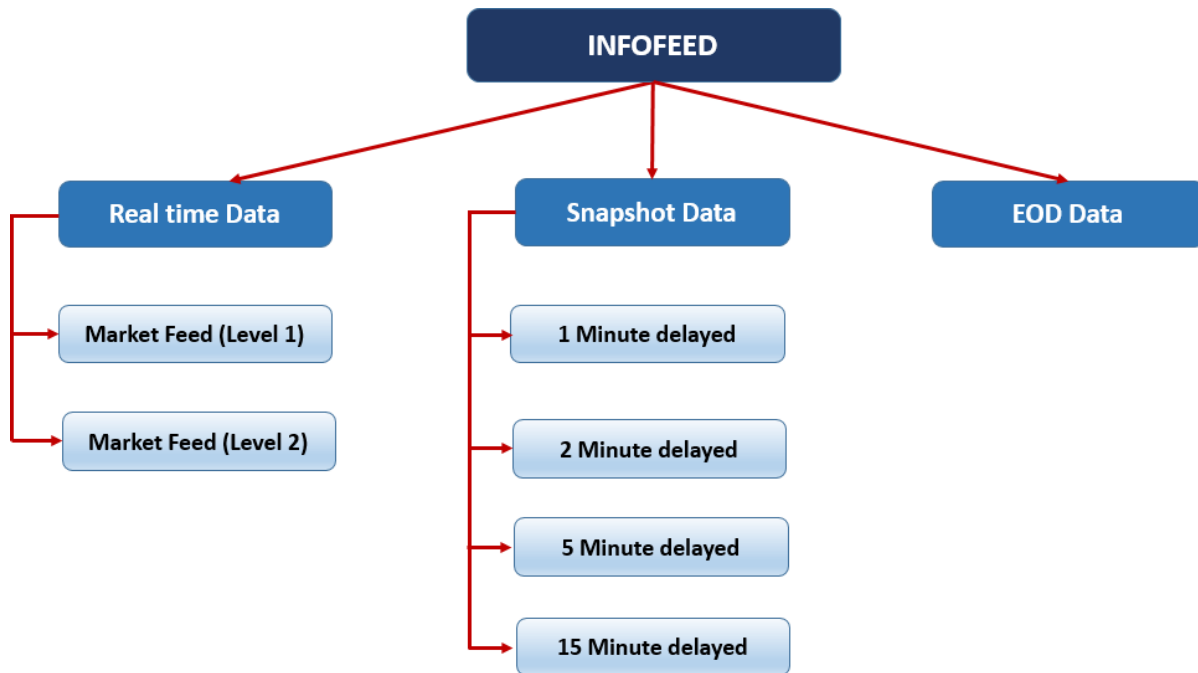
Market Feed – Commodity (Level – 1 & Level - 2)

1. Introduction

NSE Data & Analytics Ltd. disseminates NSEIL’s Commodity real time broadcast data to various information agencies. It provides the 4 different types of data products viz.

1. Real time Data
2. Snapshot Data
3. End of Day Data

The real time data is a packet broadcast available through Multicast protocol, whereas the snapshot data, end of day data and historical data is available in the form of files. All these data products come under in Infofeed application.



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

1. Real time Market Feed (Level 1)
2. Real time Market Feed (Level 2)

This document explains about the Commodity – Real time Market Feed (Level 2) product. Through this product on real time basis all the NSE's market update information is disseminated.

The information agencies connect to the Market Feed Server through Leased Lines. These leased lines are terminated on Infofeed Router and their data specific pneumatic calls are forwarded to Infofeed server. The Infofeed server accepts these pneumatic calls and creates a socket connection.

The feed consist of series of sequenced and un-sequenced variable length compressed messages. The compression algorithm used over here is LZ0 – 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.

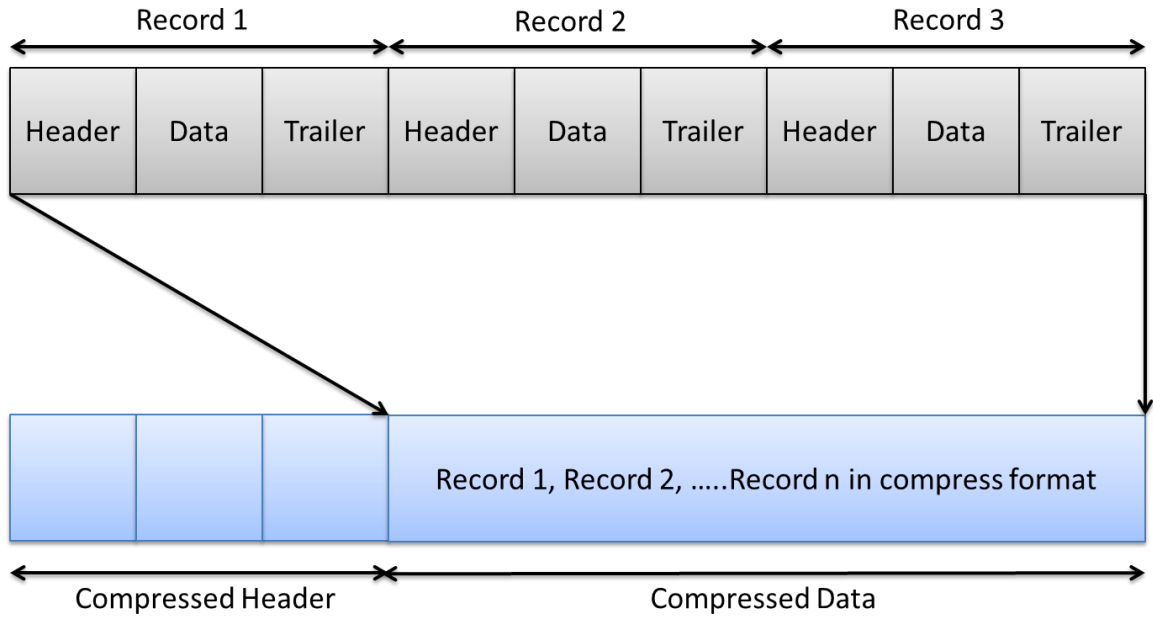
2.1 Data Types

Data types used in feed,

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

Byte order - Big Endean.

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 second if data is not available.

Field Name	Data Type	Value	Remark
INFO HEADER			
Code	SHORT	'TH'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	0(Zero) for heart beat message
INFO DATA			
Not associated with any data			
INFO TRAILER - Check sum is not computed			

4. Sequenced Data Message (Sent by server)

Sequenced data messages will be sent by server and will contain the actual market data.

4.1 BOD – Contract Master Information

These packets are sent at the beginning of the each trading day before market open. This feed contains the information about the instruments and Symbols valid in the Commodity Market for trading.

Field Name	Data Type	Value	Remark
INFO HEADER			
Code	SHORT	'TT'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Token Number	CHAR[10]	Character	Unique identifier for the symbols listed on NSE.
Instrument	CHAR[6]	Character	
Symbol	CHAR[10]	Character	
Expiry Date	CHAR[11]	Character	
Strike Price	CHAR [10]	Character	
Option type	CHAR[2]	Character	
Delete Flag	CHAR[1]	Character	
INFO TRAILER			
Check Sum	SHORT	Numeric	Refer point no. 8.
End Of Trailer	CHAR	'\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	Remark
INFO HEADER			
Code	SHORT	'TO' 'TC'	'TO' = Normal market open 'TC' = Normal market close
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Market Type	CHAR	Character	'N'-Normal
INFO TRAILER			
Check Sum	SHORT	Numeric	Refer point no. 8. Check sum is not calculated sent as 0(Zero),
End Of Trailer	CHAR	'\r'	Carriage Return

4.3 ONLINE – Spread Order Update Information – Level 1

These packets are sent during the market hours and also in the market pre open period viz. before the actual market open. It contains the latest order and trade information of spread contracts.

Field Name	Data Type	Value	Remark
INFO HEADER			
Code	SHORT	'TP'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Instrument_1	CHAR[6]	Character	
Symbol_1	CHAR[10]	Character	
Expiry date_1	CHAR[11]	Character	
Strike Price_1	CHAR[10]	Character	
Option Type_1	CHAR[2]	Character	
Instrument_2	CHAR[6]	Character	

Symbol_2	CHAR[10]	Character	
Expiry date_2	CHAR[11]	Character	
Strike Price_2	CHAR[10]	Character	
Option Type_2	CHAR[2]	Character	
Best Buy-Order Price	CHAR[17]	Character	
Best Buy-Order Quantity	CHAR[12]	Character	
Best Sell-Order Price	CHAR[17]	Character	
Best Sell-Order Quantity	CHAR[12]	Character	
Last Traded Price Difference	CHAR[17]	Character	
Total Traded Quantity	CHAR[12]	Character	
Opening Price Difference	CHAR[17]	Character	
Day High Price Difference	CHAR[17]	Character	
Day Low Price Difference	CHAR[17]	Character	
INFO TRAILER			
Check Sum	SHORT	Numeric	Refer point no. 8.
End Of Trailer	CHAR	'\r'	Carriage Return

4.4 ONLINE – Spread Order Update Information – Level 2

These packets are sent during the market hours and contains the latest order and trade information of spread contracts.

Field Name	Data Type	Value	Remark
INFO HEADER			
Code	SHORT	'TP'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Instrument_1	CHAR[6]	Character	
Symbol_1	CHAR[10]	Character	
Expiry date_1	CHAR[11]	Character	
Strike Price_1	CHAR[10]	Character	
Option Type_1	CHAR[2]	Character	
Instrument_2	CHAR[6]	Character	

Symbol_2	CHAR[10]	Character	
Expiry date_2	CHAR[11]	Character	
Strike Price_2	CHAR[10]	Character	
Option Type_2	CHAR[2]	Character	
Best Buy-Order Price-1	CHAR[17]	Character	
Best Buy-Order Quantity-1	CHAR[12]	Character	No of Contracts
Best Buy-Order Price-2	CHAR[17]	Character	
Best Buy-Order Quantity-2	CHAR[12]	Character	No of Contracts
Best Buy-Order Price-3	CHAR[17]	Character	
Best Buy-Order Quantity-3	CHAR[12]	Character	No of Contracts
Best Buy-Order Price-4	CHAR[17]	Character	
Best Buy-Order Quantity-4	CHAR[12]	Character	No of Contracts
Best Buy-Order Price-5	CHAR[17]	Character	
Best Buy-Order Quantity-5	CHAR[12]	Character	No of Contracts
Best Sell-Order Price-1	CHAR[17]	Character	
Best Sell-Order Quantity-1	CHAR[12]	Character	No of Contracts
Best Sell-Order Price-2	CHAR[17]	Character	
Best Sell-Order Quantity-2	CHAR[12]	Character	No of Contracts
Best Sell-Order Price-3	CHAR[17]	Character	
Best Sell-Order Quantity-3	CHAR[12]	Character	No of Contracts
Best Sell-Order Price-4	CHAR[17]	Character	
Best Sell-Order Quantity-4	CHAR[12]	Character	No of Contracts
Best Sell-Order Price-5	CHAR[17]	Character	

Best Sell-Order Quantity-5	CHAR[12]	Character	No of Contracts
Last Traded Price Difference	CHAR[17]	Character	
Total Traded Quantity	CHAR[12]	Character	
Opening Price Difference	CHAR[17]	Character	
Day High Price Difference	CHAR[17]	Character	
Day Low Price Difference	CHAR[17]	Character	
Total Buy Quantity	CHAR[12]	Character	
Total Sell Quantity	CHAR[12]	Character	
INFO TRAILER			
Check Sum	SHORT	Numeric	Refer point no. 8.
End Of Trailer	CHAR	'\r'	Carriage Return

4.5 ONLINE - Market Update Information – Level 1

These packets are sent during the market hours. It contains the latest order and trade information of contracts.

Field Name	Data Type	Value	Remark
INFO HEADER			
Code	SHORT	'TN'	TN = Normal market updates
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Instrument	CHAR[6]	Character	
Symbol	CHAR[10]	Character	
Expiry Date	CHAR[11]	Character	
Strike Price	CHAR[10]	Character	
Option Type	CHAR[2]	Character	
Market Type	CHAR[1]	Character	'N' =Normal
Best Buy-Order price	CHAR[17]	Character	
Best Buy-Order Quantity	CHAR[12]	Character	No of Contracts

Best Sell-Order price	CHAR[17]	Character	
Best Sell-Order quantity	CHAR[12]	Character	No of Contracts
Last Traded Price(LTP)	CHAR[17]	Character	Price of the last trade happened on the Symbol. 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
Security 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 security for the day
Low Price	CHAR[17]	Character	Low price of the security for the day
Close Price	CHAR[17]	Character	Close price of the security. 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 security. i.e. value / quantity
Total Turnover	CHAR[25]	Character	Contract traded value i.e. Average Trade Price * TTQ (Precision upto 2 decimal places)
INFO TRAILER			
Check Sum	SHORT	Numeric	Refer point no. 8.
End Of Trailer	CHAR	'\r'	Carriage Return

4.6 ONLINE - Market Update Information – Level 2

These packets are sent during the market hours. It contains the latest order and trade information of contracts.

Field Name	Data Type	Value	Remark
INFO HEADER			
Code	SHORT	'TN'	TN = Normal market updates
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Instrument	CHAR[6]	Character	
Symbol	CHAR[10]	Character	
Expiry Date	CHAR[11]	Character	
Strike Price	CHAR[10]	Character	
Option Type	CHAR[2]	Character	
Market Type	CHAR[1]	Character	'N' =Normal
Best Buy-Order price-1	CHAR[17]	Character	
Best Buy-Order Quantity-1	CHAR[12]	Character	No of Contracts
Best Buy-Order price-2	CHAR[17]	Character	
Best Buy-Order Quantity-2	CHAR[12]	Character	No of Contracts
Best Buy-Order price-3	CHAR[17]	Character	
Best Buy-Order Quantity-3	CHAR[12]	Character	No of Contracts
Best Buy-Order price-4	CHAR[17]	Character	
Best Buy-Order Quantity-4	CHAR[12]	Character	No of Contracts
Best Buy-Order price-5	CHAR[17]	Character	
Best Buy-Order Quantity-5	CHAR[12]	Character	No of Contracts
Best Sell-Order price-1	CHAR[17]	Character	

Best Sell-Order quantity-1	CHAR[12]	Character	No of Contracts
Best Sell-Order price-2	CHAR[17]	Character	
Best Sell-Order quantity-2	CHAR[12]	Character	No of Contracts
Best Sell-Order price-3	CHAR[17]	Character	
Best Sell-Order quantity-3	CHAR[12]	Character	No of Contracts
Best Sell-Order price-4	CHAR[17]	Character	
Best Sell-Order quantity-4	CHAR[12]	Character	No of Contracts
Best Sell-Order price-5	CHAR[17]	Character	
Best Sell-Order quantity-5	CHAR[12]	Character	No of Contracts
Last Traded Price(LTP)	CHAR[17]	Character	Price of the last trade happened on the Symbol. 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	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 Buy Quantity	CHAR[12]	Character	
Total Sell Quantity	CHAR[12]	Character	
Total Turnover	CHAR[25]	Character	Contract traded value i.e. Average Trade Price * TTQ (Precision up to 2 decimal places)
INFO TRAILER			
Check Sum	SHORT	Numeric	Refer point no. 8.
End Of Trailer	CHAR	'\r'	Carriage Return

4.7 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	Remark
INFO HEADER			
Code	SHORT	'TI'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Instrument	CHAR[6]	Character	
Symbol	CHAR[10]	Character	
Expiry Date	CHAR[11]	Character	
Strike Price	CHAR[10]	Character	
Option type	CHAR[2]	Character	
Open Interest	CHAR[10]	Character	
Market Type	CHAR[1]	Character	
INFO TRAILER			
Check Sum	SHORT	Numeric	Refer point no. 8.
End Of Trailer	CHAR	'\r'	Carriage Return

4.8 ONLINE - Market Message Information

These packets consist of the messages broadcast during the Trading time containing information like changes in the price bands of particular script and market-related information.

Field Name	Data Type	Value	Remark
INFO HEADER			
Code	SHORT	'TB'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Message Code	CHAR[3]	Character	NSE
Message Length	CHAR[3]	Character	Broadcast Message Length
Message String	CHAR [240]	Character	Broadcast Message
INFO TRAILER			

Check Sum	SHORT	Numeric	Refer point no. 8.
End Of Trailer	CHAR	'\r'	Carriage Return

4.9 EOD – Market Information

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	Remark
INFO HEADER			
Code	SHORT	'TS'	
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	
INFO DATA			
Instrument	CHAR[6]	Character	Instrument Type
Symbol	CHAR[10]	Character	Security 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	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			
Check Sum	SHORT	Numeric	Refer point no. 8.
End Of Trailer	CHAR	'\r'	Carriage Return

4.10 EOD – Contract Update Information

These packets are sent as the End of the Day feed on each trading day and this feed contains the information about the new contracts added to the Market for trading.

Field Name	Data Type	Value	Remark
INFO HEADER			
Code	SHORT	'TA' 'TM' 'TD'	TA = Contract added TM = Contract modified TD = Contract deleted
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	
INFO DATA			
Instrument	CHAR[6]	Character	
Symbol	CHAR[10]	Character	
Expiry Date	CHAR[11]	Character	
Strike Price	CHAR[10]	Character	
Option Type	CHAR[2]	Character	
Contract Name	CHAR[30]	Character	
Regular Lot	CHAR[5]	Character	Contract tick size
Market Type	CHAR[1]	Character	Contract face value
Tick Size	CHAR[9]	Character	(Maximum precision upto 7 decimal places)
Maturity Date	CHAR[11]	Character	Format: DD-MON-YYYY
Last Update Date & Time	CHAR[20]	Character	Format: DD-MON-YYYY HH:MM:SS
INFO TRAILER			
Check Sum	SHORT	Numeric	Refer point no. 8.

End Of Trailer	CHAR	'\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	Remark
INFO HEADER			
Code	SHORT	'TE'	
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	
INFO DATA			
Not associated with any data			
INFO TRAILER – checksum is not computed			

5. NOTE

- Prices field will have the precision up to 4th decimal places.

6. Steps for Decompressing the Data Packets

6.1 LZO Algorithm Details

LZO is a data compression library which is suitable for data de-/compression 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.

LZO implements a number of 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.

6.2 Files required for LZO algorithm.

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

6.3 Decompression steps

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

The first field is compressed or not compresses?

The second field is the number of packet in the following data packet.

The third field is data packet length.

Use the following function of LZO to Decompress.

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

lzoz_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 CX: //Indices Information
        {
            ST_INDEX_DATA *stIndexData = (ST_INDEX_DATA *)cOutputBuf;
            .
            .
            cOutputBuf = cOutputBuf + sizeof(ST_INDEX_DATA);
            break;
        }
    }
}

```

7. Checksum Calculation Algorithm

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

// Following are the defines for checksum calculation

```

#define DC1      17
#define DC3      19
#define CR       13
#define LF       10
#define POLY     0x1021
// End of defines
unsigned 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);
}

```

8. Support Information

Name	Email	Contact Number
Business & Technical Support	marketdata@nse.co.in	+91-22-26598385

9. Annexure 1

9.1 Acronyms Used

BOD	Begin Of Day Information
EOD	End Of Day Information
ONLINE	Information Sent During Market Timing