# Revision History

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Date</th>
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<tr>
<td>Version 1.0</td>
<td>NewSpecificationIssued</td>
<td>April 30, 2018</td>
</tr>
<tr>
<td>Version 1.1</td>
<td>1) Addition of Settlement Price in Change in 5.7 EOD - Market information</td>
<td>September 27, 2018</td>
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<td></td>
<td>2) Removal of Timestamp field from 5.3 ONLINE Market Update Information, 5.4</td>
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<td>ONLINE - Spread Order Update Information, 5.5 ONLINE Open Interest Information.</td>
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<td>3) Removal of Contract name field from 5.7 EOD Market Information.</td>
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<td>4) Addition of Total Buy Quantity and Total Sell Quantity field in 5.3 ONLINE -</td>
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<td>ONLINE - Market Update Information, 5.4 ONLINE - Spread Order Update Information.</td>
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<tr>
<td>Version 1.2</td>
<td>1) Consolidation of Level - 1 and Level - 2 Specification</td>
<td>10 July, 2020</td>
</tr>
<tr>
<td></td>
<td>2) Removal of TCP/IP Session Initialization chapter, Addition of Note for Multicast in 3.</td>
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<td></td>
<td>Session Messages</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Addition of TimeStamp field to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.3 ONLINE - Spread Order Update Information – Level 1, 4.4 ONLINE - Spread</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Order Update Information – Level 2, 4.5 ONLINE - Market Update Information –</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Level 1, 4.6 ONLINE - Market Update Information – Level 2, 4.7 ONLINE - Open Interest Information</td>
<td></td>
</tr>
<tr>
<td>Version 1.4</td>
<td>1. Removal of TCP/IP formats, Login Request, Login Response.</td>
<td>29 October, 2021</td>
</tr>
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</table>
Table of Contents

1. Introduction .................................................................................................................... 5

2. Packet Format .................................................................................................................. 7
   2.1 Data Types .................................................................................................................. 8
   2.2 Diagrammatic Representation of Packet Format: ......................................................... 9

3. Session Messages ........................................................................................................... 10
   3.1 Heartbeat Message (Sent by server) ........................................................................... 10

4. Sequenced Data Message (Sent by server) ................................................................. 11
   4.1 BOD – Contract Master Information ........................................................................... 11
   4.2 ONLINE - Market Status Message .............................................................................. 12
   4.3 ONLINE – Spread Order Update Information – Level 1 ........................................... 12
   4.4 ONLINE – Spread Order Update Information – Level 2 ........................................... 13
   4.5 ONLINE - Market Update Information – Level 1 ....................................................... 15
   4.6 ONLINE - Market Update Information – Level 2 ....................................................... 17
   4.7 ONLINE - Open Interest Information ....................................................................... 20
   4.8 ONLINE - Market Message Information ................................................................. 20
   4.9 EOD – Market Information ..................................................................................... 21
   4.10 EOD – Contract Update Information ...................................................................... 22
   4.11 EOD – End Of Feed Information ........................................................................... 23

5. NOTE ............................................................................................................................ 24

6. Steps for Decompressing the Data Packets ................................................................. 25
   6.1 LZO Algorithm Details ............................................................................................. 25
   6.2 Files required for LZO algorithm. ............................................................................. 25
   6.3 Decompression steps ............................................................................................... 25

7. Checksum Calculation Algorithm ................................................................................. 27

8. Support Information ...................................................................................................... 28

9. Annexure 1 ................................................................................................................... 29
   9.1 Acronyms Used .......................................................................................................... 29
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 pneumonic calls are forwarded to Infofeed server. The Infofeed server accepts these pneumonic 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 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,

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Size In Bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHAR</td>
<td>1</td>
</tr>
<tr>
<td>SHORT</td>
<td>2</td>
</tr>
<tr>
<td>INT</td>
<td>4</td>
</tr>
<tr>
<td>LONG</td>
<td>4</td>
</tr>
<tr>
<td>DOUBLE</td>
<td>8</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO HEADER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TH’</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td>0(Zero) for heart beat message</td>
</tr>
<tr>
<td>INFO DATA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not associated with any data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO TRAILER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Check sum is not computed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO HEADER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TT’</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
</tbody>
</table>

INFO DATA

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Token Number</td>
<td>CHAR[10]</td>
<td>Character</td>
<td>Unique identifier for the symbols listed on NSE.</td>
</tr>
<tr>
<td>Symbol</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Expiry Date</td>
<td>CHAR[11]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Strike Price</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Option type</td>
<td>CHAR[2]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Delete Flag</td>
<td>CHAR[1]</td>
<td>Character</td>
<td></td>
</tr>
</tbody>
</table>

INFO TRAILER

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check Sum</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Refer point no. 8.</td>
</tr>
<tr>
<td>End Of Trailer</td>
<td>CHAR</td>
<td>‘\r’</td>
<td>Carriage Return</td>
</tr>
</tbody>
</table>
4.2 ONLINE - Market Status Message
This message is sent by the server, whenever the market status changes.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO HEADER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>'TO'</td>
<td>'TO’ = Normal market open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'TC'</td>
<td>'TC’ = Normal market close</td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
<tr>
<td>INFO DATA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Type</td>
<td>CHAR</td>
<td>Character</td>
<td>‘N’-Normal</td>
</tr>
<tr>
<td>INFO TRAILER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check Sum</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Refer point no. 8. Check sum is not calculated sent as 0(Zero),</td>
</tr>
<tr>
<td>End Of Trailer</td>
<td>CHAR</td>
<td>'\r'</td>
<td>Carriage Return</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO HEADER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>'TP'</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
<tr>
<td>INFO DATA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrument_1</td>
<td>CHAR[6]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Symbol_1</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Expiry date_1</td>
<td>CHAR[11]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Strike Price_1</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Option Type_1</td>
<td>CHAR[2]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Instrument_2</td>
<td>CHAR[6]</td>
<td>Character</td>
<td></td>
</tr>
</tbody>
</table>
### Field Name | Data Type | Value | Remark
--- | --- | --- | ---
#### INFO HEADER
Code | SHORT | ‘TP’ | Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Length | SHORT | Numeric | 
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 | 

**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.
<table>
<thead>
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<th>Symbol_2</th>
<th>CHAR[10]</th>
<th>Character</th>
</tr>
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<tr>
<td>Expiry date_2</td>
<td>CHAR[11]</td>
<td>Character</td>
</tr>
<tr>
<td>Strike Price_2</td>
<td>CHAR[10]</td>
<td>Character</td>
</tr>
<tr>
<td>Option Type_2</td>
<td>CHAR[2]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Price-1</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Quantity-1</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Price-2</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Quantity-2</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Price-3</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Quantity-3</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Price-4</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Quantity-4</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Price-5</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Buy-Order Quantity-5</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Price-1</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Quantity-1</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Price-2</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Quantity-2</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Price-3</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Quantity-3</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Price-4</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Quantity-4</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Best Sell-Order Price-5</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Field Name</td>
<td>Data Type</td>
<td>Value</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>Best Sell-Order Quantity-5</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Last Traded Price Difference</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Total Traded Quantity</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Opening Price Difference</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Day High Price Difference</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Day Low Price Difference</td>
<td>CHAR[17]</td>
<td>Character</td>
</tr>
<tr>
<td>Total Buy Quantity</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
<tr>
<td>Total Sell Quantity</td>
<td>CHAR[12]</td>
<td>Character</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INFO HEADER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TN’</td>
<td>TN = Normal market updates</td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
<tr>
<td><strong>INFO DATA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symbol</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Expiry Date</td>
<td>CHAR[11]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Strike Price</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Option Type</td>
<td>CHAR[2]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Market Type</td>
<td>CHAR[1]</td>
<td>Character</td>
<td>‘N’ = Normal</td>
</tr>
<tr>
<td>Best Buy-Order price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Buy-Order Quantity</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Field</td>
<td>Type</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Best Sell-Order price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Sell-Order quantity</td>
<td>CHAR[12]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Last Traded Price (LTP)</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Total Traded Quantity (TTQ)</td>
<td>CHAR[12]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Security Status</td>
<td>CHAR[1]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Opening Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>High Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Low Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Close Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Average Trade Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Total Turnover</td>
<td>CHAR[25]</td>
<td>Character</td>
<td></td>
</tr>
</tbody>
</table>

**INFO TRAILER**

<table>
<thead>
<tr>
<th>Field</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check Sum</td>
<td>SHORT</td>
<td>Numeric</td>
</tr>
<tr>
<td>End Of Trailer</td>
<td>CHAR</td>
<td>Carriage Return</td>
</tr>
</tbody>
</table>
## 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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INFO HEADER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TN’</td>
<td>TN = Normal market updates</td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
<tr>
<td><strong>INFO DATA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symbol</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Expiry Date</td>
<td>CHAR[11]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Strike Price</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Option Type</td>
<td>CHAR[2]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Market Type</td>
<td>CHAR[1]</td>
<td>Character</td>
<td>‘N’ = Normal</td>
</tr>
<tr>
<td>Best Buy-Order price-1</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Buy-Order Quantity-1</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Best Buy-Order price-2</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Buy-Order Quantity-2</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Best Buy-Order price-3</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Buy-Order Quantity-3</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Best Buy-Order price-4</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Buy-Order Quantity-4</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Best Buy-Order price-5</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Buy-Order Quantity-5</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Best Sell-Order price-1</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Sell-Order quantity-1</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------</td>
<td>----------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Best Sell-Order price-2</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Sell-Order quantity-2</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Best Sell-Order price-3</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Sell-Order quantity-3</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Best Sell-Order price-4</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Sell-Order quantity-4</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Best Sell-Order price-5</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Best Sell-Order quantity-5</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>No of Contracts</td>
</tr>
<tr>
<td>Last Traded Price(LTP)</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>Total Traded Quantity (TTQ)</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>Volume traded today</td>
</tr>
<tr>
<td>Contract Status</td>
<td>CHAR[1]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>‘S’ = Suspended ‘ ’ = Non-suspended</td>
</tr>
<tr>
<td>Opening Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>High Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Low Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Close Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Close price of the Contract. During the day previous day’s close price is sent.</td>
</tr>
<tr>
<td>Field</td>
<td>Format</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Average Trade Price</td>
<td>CHAR[17]</td>
<td>Weighted average price of the Contract. i.e. value / quantity</td>
<td></td>
</tr>
<tr>
<td>Total Buy Quantity</td>
<td>CHAR[12]</td>
<td>Contract traded value i.e. Average Trade Price * TTQ (Precision up to 2 decimal places)</td>
<td></td>
</tr>
<tr>
<td>Total Sell Quantity</td>
<td>CHAR[12]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Turnover</td>
<td>CHAR[25]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INFO TRAILER**

<table>
<thead>
<tr>
<th>Field</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check Sum</td>
<td>SHORT</td>
<td>Numeric</td>
</tr>
<tr>
<td>End Of Trailer</td>
<td>CHAR</td>
<td>‘\r’</td>
</tr>
</tbody>
</table>

After market close, current day's close price is calculated and sent through this field.
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

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO HEADER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TI’</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
<tr>
<td>INFO DATA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symbol</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Expiry Date</td>
<td>CHAR[11]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Strike Price</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Option type</td>
<td>CHAR[2]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Open Interest</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Market Type</td>
<td>CHAR[1]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>INFO TRAILER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check Sum</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Refer point no. 8.</td>
</tr>
<tr>
<td>End Of Trailer</td>
<td>CHAR</td>
<td>‘\r’</td>
<td>Carriage Return</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO HEADER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TB’</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
<tr>
<td>INFO DATA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Message String</td>
<td>CHAR[240]</td>
<td>Character</td>
<td>Broadcast Message</td>
</tr>
<tr>
<td>INFO TRAILER</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check Sum</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Refer point no. 8.</td>
</tr>
<tr>
<td>End Of Trailer</td>
<td>CHAR</td>
<td>‘\r’</td>
<td>Carriage Return</td>
</tr>
</tbody>
</table>

### INFO HEADER

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TS’</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER) (Variable length depending upon Message Length field of INFO DATA structure)</td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td></td>
</tr>
</tbody>
</table>

### INFO DATA

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument</td>
<td>CHAR[6]</td>
<td>Character</td>
<td>Instrument Type</td>
</tr>
<tr>
<td>Symbol</td>
<td>CHAR[10]</td>
<td>Character</td>
<td>Security symbol</td>
</tr>
<tr>
<td>Expiry Date</td>
<td>CHAR[11]</td>
<td>Character</td>
<td>Expiry Date</td>
</tr>
<tr>
<td>Strike Price</td>
<td>CHAR[10]</td>
<td>Character</td>
<td>Strike Price</td>
</tr>
<tr>
<td>Option Type</td>
<td>CHAR[2]</td>
<td>Character</td>
<td>Option Type</td>
</tr>
<tr>
<td>Market Type</td>
<td>CHAR[1]</td>
<td>Character</td>
<td>‘N’=Normal</td>
</tr>
<tr>
<td>Opening Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td>Contract open price for the day</td>
</tr>
<tr>
<td>Trade High Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td>Contract high price for the day</td>
</tr>
<tr>
<td>Trade Low Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td>Contract low price for the day</td>
</tr>
<tr>
<td>Closing Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td>Contract close price for the day</td>
</tr>
<tr>
<td>Last Traded Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td>Contract last traded price for the day</td>
</tr>
<tr>
<td>Previous Close Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td>Contract previous day’s close price</td>
</tr>
<tr>
<td>Settlement Price</td>
<td>CHAR[17]</td>
<td>Character</td>
<td>Contract settlement price for the day</td>
</tr>
<tr>
<td>Total Traded Quantity</td>
<td>CHAR[12]</td>
<td>Character</td>
<td>Volume traded today for the contract</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INFO HEADER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TA’</td>
<td>TA = Contract added</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘TM’</td>
<td>TM = Contract modified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘TD’</td>
<td>TD = Contract deleted</td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
<tr>
<td><strong>INFO DATA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symbol</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Expiry Date</td>
<td>CHAR[11]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Strike Price</td>
<td>CHAR[10]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Option Type</td>
<td>CHAR[2]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Contract Name</td>
<td>CHAR[30]</td>
<td>Character</td>
<td></td>
</tr>
<tr>
<td>Regular Lot</td>
<td>CHAR[5]</td>
<td>Character</td>
<td>Contract tick size</td>
</tr>
<tr>
<td>Market Type</td>
<td>CHAR[1]</td>
<td>Character</td>
<td>Contract face value</td>
</tr>
<tr>
<td>Tick Size</td>
<td>CHAR[9]</td>
<td>Character</td>
<td>(Maximum precision upto 7 decimal places)</td>
</tr>
<tr>
<td><strong>INFO TRAILER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check Sum</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Refer point no. 8.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
<th>Value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO HEADER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>SHORT</td>
<td>‘TE’</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>SHORT</td>
<td>Numeric</td>
<td>Size of (INFO HEADER + INFO DATA + INFO TRAILER) (Variable length depending upon Message Length field of INFO DATA structure)</td>
</tr>
<tr>
<td>Sequence Number</td>
<td>LONG</td>
<td>Numeric</td>
<td></td>
</tr>
<tr>
<td>INFO DATA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not associated with any data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO TRAILER – checksum is not computed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

\[
\text{r} = \text{lzo1z_decompress} \quad ((\text{lzo}_\text{byte}*)\text{cInputBuf}, \text{ipLength}, \\
(\text{lzo}_\text{byte}*)\text{cOutputBuf}, \text{ipLength}, \text{opLength}, \text{NULL});
\]

\text{lzo1z_decompress}: Function which decompresses the data packet received
\text{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:**

```c
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;
        ucChk[1] -= 1;
    uAccum = ucChk[1];
    uAccum = (uAccum<<8) + ucChk[0];
    return(uAccum);
}
8. Support Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Contact Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business &amp; Technical Support</td>
<td><a href="mailto:marketdata@nse.co.in">marketdata@nse.co.in</a></td>
<td>+91-22-26598385</td>
</tr>
</tbody>
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9. Annexure 1

9.1 Acronyms Used

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>BOD</td>
<td>Begin Of Day Information</td>
</tr>
<tr>
<td>EOD</td>
<td>End Of Day Information</td>
</tr>
<tr>
<td>ONLINE</td>
<td>Information Sent During Market Timing</td>
</tr>
</tbody>
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