Broadcast Specification Document For

Futures and Options Trading System

Version 1.0.4

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Preface

Purpose

This document describes the protocol to be used to receive the broadcast for Futures and Options Trading System (FOTS).

Target Audience

This document is written for system designers and programmers of user organizations and third party software developers who are responsible for the development of software to interact with NSE's Futures and Options Trading System.

Organization of This Document

This document is organized as follows:

Chapters	Description
Chapter 1	It details the data types used and also covers the Broadcast Header, MESSAGE_HEADER that is prefaced with all the structures.
Chapter 2	Describes the details of header, data and trailer of Bhav Copy.
Chapter 3	Describes the various Broadcast messages and the Compression and Decompression algorithm of Broadcast data.
Appendix	Transaction codes and also covers the various market statuses, market types and book types etc.

Abbreviations and Acronyms Used

The abbreviations and acronyms used in this document are:

AGM	Annual General Meeting
AON	All Or None
ATO	At The Opening
AU	Auction
BCID	Broadcast Circuit ID

EGM	Extraordinary General Meeting
GTC	Good Till Cancellation
GTD	Good Till Date
LTP	Last Traded Price
MBO	Market By Order
MBP	Market By Price
MF	Minimum Fill
NEAT	National Exchange for Automated Trading
NNF	Non Neat Front End
NSE	National Stock Exchange
NT	Negotiated Trade
OL	Odd Lot
RL	Regular Lot
SL	Stop Loss
ST	Special Terms
TM	Trading Member
TWS	Trader Workstation

1 Chapter 1 General Guidelines

1.1 Introduction

This chapter describes general guidelines for the protocol to be used to interpret the broadcast information sent by the Trading System. The System operates on X25 as well as IP protocol.

1.2 Message Structure Details

The message structure consists of two parts namely message header and message data. The message header consists of the fields of the header which is prefaced with all the structures.

The message data consists of the actual data that is sent across to the host or received from the host.

Transaction code, an important field of the message header, is a unique numeric identifier which is sent to or received from the trading system. This is used to identify the transaction between the TWS and the host end.

1.3 Guidelines for Designers

- All time fields are number of seconds from midnight January 1, 1980.
- All price fields must be multiplied by 100 before sending to the host end and divided by 100 while receiving from the host end as the host system processes prices in paise.

1.4 Guidelines for Programmers

- If your system uses little-endian order, the data types such as UINT, SHORT, LONG and DOUBLE contained in a packet, which occupy more than one byte should be twiddled (byte reversed). Twiddling involves reversing a given number of bytes such that the byte in ‘n’ position comes to the first position; the byte in (n-1) position comes to the second position and so on. For example, if the value to be sent is 1A2B (hexadecimal), reverse the bytes to 2B1A. The same applies while receiving messages. So if the value received is 02BC, the actual value is BC02. So twiddle such data types before sending and after receiving to ensure that correct data is sent and received.

  Note:

  Twiddling is required because of the variety in endian order—big and little. A big-endian representation has a multibyte integer written with its most significant byte on the left. A little-endian representation, on the other hand, places the most significant byte on the right. Intel's 80x86 processors and their clones are little endian. Sun's SPARC, Motorola's 68K, and the PowerPC families are all big endian. All of the protocol layers in the TCP/IP suite are defined to be big endian. The trading system host end uses big-endian order. Suppose your machine uses little-endian order. Twiddle the numeric value before sending and after receiving over a TCP/IP connection.

- All the structures should be defined in the following manner:

  1. Items of type char or unsigned char, or arrays containing items of these types, are byte aligned.
  2. Structures are word aligned; structures of odd size are padded to an even number of bytes.
  3. All other types of structure members are word aligned.

- All reserved fields mentioned should be mapped to CHAR buffer and initialized to NULL.

- Inside the broadcast packet, the first byte indicates the market type. Ignore the next 7 bytes. If the first byte is 2 it indicates Futures & Options market. The message header starts from the 9th byte. The remaining portion of the buffer has to be mapped to the broadcast structures mentioned in the document.

Note:

- The values of all the transaction codes given in the document are listed in Appendix.

1.5 Message Structure Details

The message structure consists of two parts namely message header and message data. The message header consists of the fields of the header which is prefaced with all the structures.

The message data consists of the actual data that is sent across to the host or received from the host.

Transaction code, an important field of the message header, is a unique numeric identifier which is sent from the trading system.

1.6 Data Types Used

Data Type	Size in Bytes	Signed/ Unsigned
CHAR	1	Signed
UINT	2	Unsigned
SHORT	2	Signed
LONG	4	Signed
DOUBLE	8	Signed and Floating Point
BIT	1 bit	NA

1.7 Message Header

Each structure is prefaced with a MESSAGE_HEADER. Some data in the header are fixed whereas some data are variable and set differently for each transaction code. The structure of the MESSAGE_HEADER is as follows:

Structure Name: MESSAGE_HEADER	
Packet Length: 38 bytes	
CHAR	iApiTcode
CHAR	iApiFuncId
LONG	LogTime
CHAR	AlphaChar [2]
SHORT	TransactionCode
SHORT	ErrorCode
CHAR	Reserved [8]
CHAR	TimeStamp1 [8]
CHAR	TimeStamp2 [8]
SHORT	MessageLength

Field Name	Description	Comment
LogTime	This field should be set to zero while sending messages to the host. For messages coming from the host, this contains the time when the message was generated by the trading system host.	
AlphaChar	This field should be set to the first two characters of Symbol if the structure contains Symbol and Series. In other cases, it should be set to blank.	The Symbol field should contain the name of the security. The series field should contain xx.
TransactionCode	This field should contain the transaction message number. This describes the type of message sent or received.	
ErrorCode	This should be set to zero while sending messages to the host. For messages coming from the host, this describes the type of error.	
TimeStamp1	This field contains the time the message arrives at the trading system host. This should be set to numeric zero while sending to host.	In TimeStamp1, current time is sent in jiffies from host end. This is 8 bytes in host

Field Name	Description	Comment
		end. In front end, we typecast the first four bytes into double and store it in a variable and typecast the other four bytes into double and store in another variable. These values are used while requesting message area download.
TimeStamp2	This field should be set to numeric zero while sending to the host. For messages coming from the host, this field contains the number of the machine from which the packet is coming.	In TimeStamp2, machine number is sent from the host end. This is 8 bytes in host end and CHAR [8] in front end. In front end, if it is an interactive connection, machine number is stored in 7th position and for broadcast connection machine number is stored in 0th position.
MessageLength	This field is set to the length of the entire message, including the length of Message Header.	

1.8 Broadcast Process Header

The broadcast messages like market open, market close, market in pre-open are prefaced with BCAST_HEADER. Some fields in the header are fixed. The remaining fields are variable and set differently for each transaction code. The structure of the BCAST_HEADER is as follows:

Structure Name: BCAST_HEADER
Packet Length: 46 bytes

```
Reserved 1 byte
Reserved 1 byte
LONG      LogTime
CHAR      AlphaChar [2]
SHORT     TransCode
SHORT     ErrorCode
LONG      BCSeqNo
Reserved  4 Bytes
CHAR      TimeStamp2 [8]
CHAR      Filler [8]
SHORT     MessageLength
```

Field Name	Description	Comment
LogTime	This field contains the time when the message was generated by the trading system host.	
AlphaChar	This field is set to the first two characters of Symbol if the structure contains Symbol and Series; otherwise it is set to blank. The normal market open and close broadcast messages were received by the Front End with 'TD' in the alpha char field. The segment open and close messages will be broadcasted with 'S1', 'S2', 'S3' and 'S4' in the alpha char field for the 4 segments where S1= REGULAR SEGMENT S2 = EXTENDED SEGMENT S3 = EXTENDED1 S4 = EXTENDED2	
TransactionCode	This field contains the transaction message number. This describes the type of message received or sent.	

Field Name	Description	Comment
ErrorCode	This field contains the error number which describes the type of error.	
BCSeqNo	This field contains BCAST Sequence number for Ericcson switch.	
TimeStamp2	This field contains the time when message is sent from the host.	
Filler2	This field contains the machine number.	
MessageLength	This field is set to the length of the entire message, including the length of the message header.	

1.9 Error Message

When the Error Code in the MESSAGE_HEADER is not zero, the structure sent is ERROR RESPONSE. The Error Message will describe the error received. The structure is as follows:

Structure Name: MS_ERROR_RESPONSE
Packet Length: 180 bytes
MESSAGE_HEADER CHAR Key [14] CHAR ErrorMessage [128]

Field Name	Description	Comment
ErrorMessage	This field contains the error message. Refer to *List of Errors Codes* in Appendix.	
Key	This field contains the token number of the Contract.	

1.10 Structure Reference

1.10.1 Contract Descriptor structure

```
STRUCT CONTRACT_DESC
    {
        CHAR   Instrument Name[  6  ]
        CHAR    Symbol [ 10 ]
        LONG   Expiry Date
        LONG   Strike Price
        CHAR   Option Type[  2 ]
        SHORT  CA Level;
    }
```

2 Bhav Copy

2.1 Introduction

At the end of the day the bhav copy is broadcast. Firstly, a message is sent saying that the broadcast of the bhav copy will start now. Then the header is sent indicating the actual data will follow this packet. Then the data for non-depository is sent. On completion of the data of the depository securities, a packet follows stating that the bhav copy for the depository securities will be broadcast after this packet. Thereafter, the data for the depository securities is broadcast. After the header data packet is sent. This follows the trailer record, marking the end of bhav copy.

2.2 Message Stating the Transmission of Bhav Copy Will Start Now

This is the first message which is broadcast saying the bhav copy will be started now. The structure sent is:

MS_BCAST_MESSAGE (Refer to *Broadcast,* section 3)

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_JRNL_VCT_MSG (6501).	

2.3 Header of Report on Market Statistics

A header precedes the actual bhav copy that is sent to the trader. The message structure sent is:

REPORT HEADER

Structure Name: MS_RP_HDR
Packet Length: 104 bytes
Transaction Code: RPRT_MARKET_STATS_OUT_RPT (1833)
STRUCT MESSAGE_HEADER (Refer to *Message Header* in Section 1) CHAR MessageType LONG ReportDate

```
SHORT    UserType
CHAR     BrokerId [5]
CHAR     FirmName [25]
SHORT    TraderNumber
CHAR     TraderName [26]
```

Field Name	Description	Comment
TransactionCode	The transaction code is RPRT_MARKET_STATS_OUT_RPT (1833).	
MessageType	This field is set to 'H' denoting Header.	
OrgScope	This field is reserved for future use.	
ReportDate	Set to the report date.	
UserType	This field specifies type of user. It is set to '-1'.	
BrokerId	This field specifies Trading Member ID. It is set to blank.	
BrokerName	This field specifies the name of the broker. It is set to blank.	
TraderNumber	This field specifies trader/user ID. It is set to zero.	
TraderName	This field specifies the name of the trader. It is set to blanks.	

2.4 Report on Market Statistics

This is the actual data that is sent for the report.

REPORT MARKET STATISTICS

Structure Name: MS_RP_MARKET_STATS
Packet Length: 486 bytes
Transaction Code: RPRT_MARKET_STATS_OUT_RPT (1833).
STRUCT MESSAGE_HEADER (Refer to *Message Header* in Section 1) CHAR MessageType Reserved 1 byte SHORT NumberOfRecords STRUCT MKT_STATS_DATA [6] { STRUCT CONTRACT_DESC (Refer to Section 1.4.1)

```
            SHORT    MarketType
            LONG     OpenPrice
            LONG     HighPrice
            LONG     LowPrice
            LONG     ClosingPrice
            LONG     TotalQuantityTraded
            DOUBLE   TotalValueTraded
            LONG     PreviousClosePrice
            LONG     OpenInterest
            LONG     ChgOpenInterest
            CHAR     Indicator [4]
      }
```

Field Name	Description	Comment
TransactionCode	The transaction code is RPRT_MARKET_STATS_OUT_RPT (1833).	
MessageType	This field is set to ‘R’.	
NumberOfRecords	This field contains the number of markets for which Market Statistics is being sent. In a packet maximum 6 records can be packed.	
Symbol	This field contains the Symbol of the security.	
Series	This field contains the series of a security.	
MarketType	This field contains one of the following values. • ‘1’ for Normal market • ‘2’ for Odd lot market • ‘3’ for Spot market • ‘4’ for Auction market	
OpenPrice	This field contains the open price of a security.	
HighPrice	This field the highest trade price.	
LowPrice	This field contains the lowest trade price.	
ClosingPrice	This field contains the closing price of a security.	
TotalQuantityTraded	This field contains the total quantity of the security that has been traded today.	

Field Name	Description	Comment
TotalValueTraded	This field contains the total value of the securities trade.	
PreviousClosePrice	This field contains the previous day's closing price.	
OpenInterest	This field contains the open interest value.	
ChgOpenInterest	This field contains the change in value of open interest.	

2.5 Trailer Record

This indicates that the transmission of bhav copy ends here. The structure is:

REPORT TRAILER

Structure Name: MS_RP_TRAILER
Packet Length: 42 bytes
Transaction Code: RPRT_MARKET_STATS_OUT_RPT (1833).
MESSAGE_HEADER (Refer to *Message Header* in Section 1) CHAR MessageType LONG NumberOfPackets Reserved 1 byte

Field Name	Description	Comment
TransactionCode	The transaction code is: RPRT_MARKET_STATS_OUT_RPT (1833).	
MessageType	This is set to 'T' denoting trailer record.	
NumberOfRecords	This contains the number of data packets sent in the bhav copy.	

3 Spread Bhav Copy

3.1 Introduction

After completion of Early bhav copy broadcast, spread bhav copy will be broadcasted. Initially a message will be sent in the broadcast message transcode BCAST_JRNL_VCT_MSG for the start of the spread bhav copy. After the message the header will be sent to indicate the start of spread bhavcopy broadcast which will be followed by actual data packets. After the data packets the trailer record, marking the end of bhav copy will be sent. Finally on completion of download, a message " Spread bhavcopy broadcasted successfully" will be sent in BCAST_JRNL_VCT_MSG

3.2 Message Stating the Transmission of Bhav Copy Will Start Now

The message will sent in the existing structure

MS_BCAST_MESSAGE (Refer to *Broadcast,* Chapter 10 in NNF Document 8.1.1, Version 7.0)

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_JRNL_VCT_MSG (6501).	

3.3 Header of Report on Market Statistics

A header precedes the actual Spread bhav copy that will be sent to the trader. The message structure sent is:

REPORT HEADER

Structure Name: MS_RP_HDR
Packet Length: 42 bytes
Transaction Code: RPRT_SPD_MARKET_STATS_OUT_RPT(1862)

```
STRUCT   MESSAGE_HEADER    (Refer to
         Message Header in Chapter 2 in NNF
         Document 8.1.1, Version 7.0)
CHAR     MessageType
CHAR     Reserved
SHORT    NoOfRecords
```

Field Name	Description	Comment
TransactionCode	The transaction code is RPRT_MARKET_STATS_OUT_RPT (1833).	
MessageType	This field is set to 'H' denoting Header.	
Reserved	Reserved for future use	
NoOfRecords	No of records	

3.4 Report on Spread Market Statistics

This is the actual data that will be sent for the report.

REPORT SPREAD MARKET STATISTICS

Structure Name: RP_SPD_MKT_STATS

Packet Length: 276 bytes

Transaction Code: RPRT_SPD_MARKET_STATS_OUT_RPT (1862).

```
STRUCT     MESSAGE_HEADER  (Refer to Message
           Header in Chapter 2 in NNF Document
           8.1.1, Version 7.0)
CHAR       MessageType
Reserved 1 byte
SHORT      NumberOfRecords
STRUCT     SPD_STATS_DATA [3]
{
    SHORT MARKETTYPE
    CHAR   INSTRUMENTNAME1[6]
    CHAR   SYMBOL1[10]
    LONG   EXPIRYDATE1
    LONG   STRIKEPRICE1
    CHAR   OPTIONTYPE1[2]
    SHORT  CALEVEL1
    CHAR   INSTRUMENTNAME2[6]
    CHAR   SYMBOL2[10]
    LONG   EXPIRYDATE2
```

```
        LONG    STRIKEPRICE2
        CHAR    OPTIONTYPE2[2]
        SHORT  CALEVEL2
        LONG     OPENPD
        LONG     HIPD
        LONG     LOWPD
        LONG     LASTTRADEDPD
        LONG     NOOFCONTRACTSTRADED

    }
```

Field Name	Description	Comment
TransactionCode	The transaction code is RPRT_SPD_MARKET_STATS_OUT_RPT (1862).	
MessageType	This field is set to 'R'.	
NumberOfRecords	This field contains the number of markets for which Market Statistics is being sent. In a packet maximum 3 records can be packed.	
MarketType	This field contains one of the following values. • '1' for Normal market • '2' for Odd lot market • '3' for Spot market • '4' for Auction market	
Symbol1/Symbol2	This field contains the Symbol of the security of leg1 and leg2.	
Instrument1/Instrument2	This field contains the instrument type of leg1 contract and leg 2 contract.	
Expirydate1/ExpiryDate2	This field contains the Expiry date of leg 1 and leg2 contract respectively.	
StrikePrice1/StrikePrice2	This field the strike price1 and strike price 2 of leg1 and leg2 of spread contract	Will not be used as spread for options are not allowed.
OptionType1/OptionType2	This field contains the Option type of leg1 and leg2 of spread contract	Will not be used as spread for options are not allowed.
CALevel1/CAlevel2	This field contains the CAlevel value of leg1 and leg2 of spread contract.	Will not be used as spread for options

Field Name	Description	Comment
		are not allowed.
OpenPD	This field contains the Open Price differnce of spread contract.	
HiPD	This field contains the High Price difference of spread contract	
LowPD	This field contains the Low price difference traded for spread contract	
LastTradedPD	This field contains the value of last traded price diffence of spread contract.	
NoOfContractsTraded	This field contains number of contracts traded.	

3.5 Trailer Record

After the data packets a final trailer record will be sent to indicate the end of transmission for spread bhavcopy. The structure is:

REPORT TRAILER

Structure Name: SPD_RP_TRAILER
Packet Length: 44 bytes
Transaction Code: RPRT_SPD_MARKET_STATS_OUT_RPT (1862).
MESSAGE_HEADER (Refer to *Message Header* in Chapter 2 in NNF Document 8.1.1, Version 7.0) CHAR MessageType LONG NumberOfPackets Reserved 1 byte

Field Name	Description	Comment
TransactionCode	The transaction code is: RPRT_MARKET_STATS_OUT_RPT (1862).	
MessageType	This is set to ‘T’ denoting trailer record.	
NumberOfPackets	This contains the number of data packets sent in the spread bhav copy.	This is sent as 0 from host

4 Broadcast

4.1 Introduction

This section describes the Compression and Decompression algorithm of Broadcast data and the various Broadcast messages with their structures.

4.2 Compression of the Broadcast Data

The broadcast traffic from the exchange, which gives the on-line quotes to the trading terminals, has been continually increasing, especially during market open and market close. To accommodate the increased broadcast traffic, the exchange has come up with a compression algorithm to compress some of the specific broadcast transaction codes, which are as follows

Transaction Code	Represents
7200	MBO/MBP
7201	Mkt Watch
7202	Ticker
7208	Only MBP

LZO compression algorithm is used to compress the above specified broadcast transaction codes. The details of the LZO compression algorithm is described below
The LZO stands for Lempel Ziv Oberhaumer. This algorithm is freely available on the internet (URL: http://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

4.3 Decompression routine:

NSE will provide the object file containing the decompression routine.

4.3.1 Sequential Packing

To improve the effective data transfer the idea of sequential packing along with the lzo compression algorithm has been incorporated. At the host end sequential packing algorithm packs the incoming data packets, which is then transmitted over the network. The data packets are packed in FIFO order

.For example,

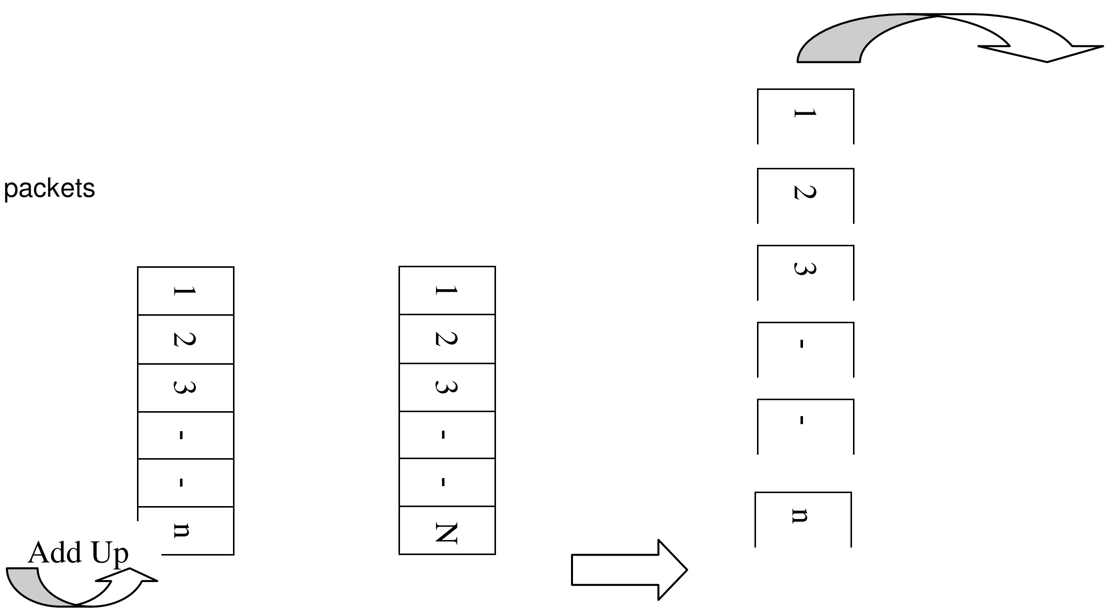
If n packets are packed in a buffer they are arranged in the following order.

1 st packet will be stored at the first place in the buffer, 2nd Packet will be stored at the second place, and so on..

At the front end while de packing the buffer, the packets are to be segregated in the same order i.e isolate each packet and process each packet as per the sequence viz- first packet first and last packet at the end. The packets within a buffer may be an admixture of compressed and uncompressed data packets.

Host End Sends *Front End Receives* *Front end De-packing*

Process packets



4.3.2 Structure

Incoming packet at the front end can be interpreted by mapping onto the following structure.

```
Struct {
        CHAR   cNetId [2]
        SHORT iNoPackets
```

```
        CHAR   cPackData [534]
    }   BcastPackData
```

where,

cNetId[2]	Identifies the machine (CM broadcast or F&O Broadcast)
iNoPackets	The number of packets that are sequentially packed
cPackData	Buffer containing all the packets.

The buffer when mapped to, by the above structure, the number of packets in the buffer can be known. The next task is to segregate the packets and process the individual packets.

4.3.3 Pseudocode

```
struct {
SHORT iCompLen
CHAR   cCompData[MAX_MESSAGE_SIZE]
                    }BcastCmpPacket
```

Note: The above structure is currently used to interpret the incoming packets.

The iCompLen intimates us whether the packet is compressed or uncompressed. For the compressed packets (iCompLen > 0) pass the buffer to the decompression routine, else follow the uncompressed packet routing.

The packets received through the broadcast traffic have to be interpreted as follows

```
COMPRESSION_BROADCAST_DATA
{
SHORT CompressionLen
CHAR BroadcastData [ ]
}
```

- The first two bytes of the broadcast packet indicate the length of the data after compression.
- If the compression length is zero, the data received is not compressed.
- If the length is non-zero, the data following the length should be decompressed
- By using the decompression routine. Inside the broadcast data, the first 8 bytes before the message header should be ignored. The message header starts from the 9th byte.

4.4 Implementation at Front End

The lzo directory (lzo1.07) contains all the lzo source, header and library files.
These files are to be included while building an application.

Sample Implementation using MS-Visual Studio VC++ 6.0:
Put lzo 1.07 folder in C drive.
Go to Microsoft Visual C++
Go to Tools -> Options -> Directories [ALT T O]
Set the following in the "Show directories for:"

A Include files – C:\lzo1.07
B Library files – C:\lzo1.07
C Source files – C:\lzo1.07

Go to Project->settings->Link [ALT F7]
Add lzo.lib in object / library module.

lzo1z_decompress is used for decompression. This is a function of the lzo library.
An API has to be developed to encompass the above LZO decompression function.

The syntax of the call should be:
lzo_decomp (char* inp_buff, unsigned int* inp_len, char* buffer_decomp, unsigned int *output_len, unsigned short *errorCode)
Where, lzo_decomp is a function of the API (to be developed by referring to the examples specified in the lzo 1.07 directory) that calls the lzo function for decompression "lzo1z_decompress"

Inp_buff	Specifies the input buffer (Compressed Buffer)
Inp_len	Specifies the length of input buffer (Compressed Length)
Buffer_decomp	Specifies the Buffer after decompression
output_len	Specifies the length after decompression (Out put length)
errorCode	Specifies the error code

The syntax of the lzo decompress function is as follows:

lzo1z_decompress (out, decomp_inlen, in, & decomp_outlen, NULL)

Where

out	Specifies input compressed buffer
decomp_inlen	Specifies the input length of the buffer (Length of Compressed buffer)
in	Specifies the out put (decompressed) buffer
decomp_outlen	Specifies the output length of the decompressed buffer

Note:

Inside the broadcast data, the first byte indicates the market type. Ignore the rest of the 7 bytes before message header. If the first byte has the value of '2', it is futures and options market.

The message header starts from 9^{th} byte. The remaining portion of the buffer has to be mapped as usual form the message header to the following structures as specified from section 3.2 in broadcast section.

4.5 General Message Broadcast

Any general message is broadcast in the following structure. The structure being sent is:

Structure Name: MS_BCAST_MESSAGE
Packet Length: 295 bytes
Transaction Code: BCAST_JRNL_VCT_MSG (6501)
STRUCT MESSAGE_HEADER (Refer to *Message Header* in Section 1) SHORT BranchNumber CHAR BrokerNumber [5] CHAR ActionCode [3] STRUCT ST_BCAST_DESTINATION Reserved 26 byte **Note:** Use any one of following two ST_BCAST_DESTINATION structures: **For Small Endian Machines** STRUCT ST_BCAST_DESTINATION {

```
                Reserved           : 4 BIT
                Journaling Required: 1 BIT
                Tandem             : 1 BIT
                ControlWorkstation : 1 BIT
                Trader Workstation : 1 BIT
                Reserved           : 1 byte
            }
```

For Big Endian Machines

```
        STRUCT   ST_BCAST_DESTINATION
            {
                Trader Workstation : 1 BIT
                ControlWorkstation : 1 BIT
                Tandem             : 1 BIT
                Journaling Required: 1 BIT
                Reserved           : 4 BIT
                Reserved           : 1 byte
            }

        SHORT    BroadcastMessageLength
        CHAR     BroadcastMessage [239]
```

Field Name	Description	Comment
TransactionCode	The transaction code is: BCAST_JRNL_VCT_MSG (6501).	
BranchNumber	This field contains the branch number of the trader to which he belongs.	
BrokerNumber	This field contains the Trading Member ID of the broker.	
ActionCode	This field contains the action code which indicates the action taken.	For example, ‘SYS’ - system ‘LIS’ - Listing
Broadcast Destination	This field specifies the destination of the message, that is, Trader Workstation or Control Workstation.	
Broadcast MessageLength	This field contains the length of the broadcast message.	
BroadcastMessage	This field contains the broadcast message.	

4.6 Change in System Status/ Parameters

This message is sent when any global operating parameters are changed or status of markets is changed.

SYSTEM INFORMATION DATA

MS_SYSTEM_INFO_DATA

Structure Name: MS_SYSTEM_INFO_DATA

Packet Length: 104 bytes

Transaction Code: BCAST_SYSTEM_INFORMATION_OUT (7206).

```
STRUCT   MESSAGE_HEADER  (Refer to Message
                   Header in Chapter 2)
STRUCT   ST_MARKET_STATUS
    {
        SHORT        Normal
        SHORT        Oddlot    (Not used)
        SHORT        Spot      (Not used)
        SHORT        Auction   (Not used)
    }
STRUCT   ST_EX_MARKET_STATUS
    {
        SHORT        Normal
        SHORT        Oddlot    (Not used)
        SHORT        Spot      (Not used)
        SHORT        Auction   (Not used)
    }
STRUCT   ST_PL_MARKET_STATUS
    {
        SHORT        Normal
        SHORT        Oddlot    (Not used)
        SHORT        Spot      (Not used)
        SHORT        Auction   (Not used)
    }
CHAR     UpdatePortfolio
LONG     MarketIndex
SHORT    DefaultSettlementPeriod (Normal)
SHORT    DefaultSettlementPeriod (Spot)
SHORT    DefaultSettlementPeriod (Auction)
SHORT    CompetitorPeriod
SHORT    SolicitorPeriod
SHORT    WarningPercent
SHORT    VolumeFreezePercent
SHORT    SnapQuoteTime
Reserved 2 byte
LONG     BoardLotQuantity
LONG     TickSize
SHORT    MaximumGtcDays
```

Note: Use any one of following two structures:

For Small Endian Machines:

```
    Struct  ST_STOCK_ELIGIBLE_INDICATORS
        {
            Reserved          : 5 BIT
            Books Merged      : 1  BIT
            Minimum Fill      : 1  BIT
            AON               : 1  BIT
            Reserved          : 1 byte
        }
For Big Endian Machines:
    Struct  ST_STOCK_ELIGIBLE_INDICATORS
        {
            AON               : 1  BIT
            Minimum Fill      : 1  BIT
            Books Merged      : 1  BIT
            Reserved          : 5  BIT
            Reserved          : 1 byte
        }

    SHORT   DisclosedQuantityPercentAllowed
    LONG    RiskFreeInterestRate
```

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_SYSTEM_INFORMATION_OUT (7206).	
MarketStatus	This field contains the following values: • '0' if it is Preopen (for Normal market only) • '1' if it is Open • '2' if it is Closed • '3' if it is Preopen Closed • '4' if it is Postclose	In the pre-open state of the market, orders can only be entered but no matching takes place. The trading starts when the market is open. No orders can be entered for a security when the market is closed.
UpdatePortfolio	This field contains: • 'N' if there is no change in portfolio. • 'Y' if there is any change in portfolio after Last Update Portfolio Time in the request.	You have to update your LDB portfolio file by sending EXCH_PORTF_IN (1775) request.

Field Name	Description	Comment
MarketIndex	This field contains the current market index.	
SettlementPeriod	The default settlement period in various markets is sent in the fields Default Settlement (Normal), Default Settlement (Spot) and Default Settlement (Auction).	
CompetitorPeriod	This field contains the default competitor period for auction.	
SolicitorPeriod	This field contains the default solicitor period for auction.	
WarningPercent	This field contains the warning percentage. (Refer to *Turnover Limit Exceeded or Broker Reactivated* in Chapter 10)	If a broker exceeds his turnover by this value in percent, then a warning message is broadcast to all traders.
VolumeFreeze Percent	This field contains the volume freeze percent. (Refer to *Turnover Limit Exceeded or Broker Reactivated* in Chapter 10)	If a broker exceeds his turnover by this value in percent, the broker is deactivated and a message is broadcast to all traders.
SnapQuoteTime	This field contains the snap quote time. Currently, it is 60 seconds.	
BoardLotQuantity	This field contains the board lot quantity. The regular lot order quantity must be a multiple of this quantity.	
TickSize	This field contains the tick size. The order price, and the trigger price - if applicable, must be a multiple of this tick size.	
MaximumGtcDay s	This field contains the maximum number of days after which a Good Till Canceled order will be canceled. Currently this field contains zero.	
SecurityEligibility Indicator	This field contains the MF or AON flag set. If the MF flag is set, orders have the Minimum Fill attribute set. If the AON flag is set orders have the AON attribute set.	
DisclosedQuantity PercentAllowed	This field contains the disclosed quantity percentage allowed. The disclosed quantity if set may not be greater than this percent of the total quantity.	

Field Name	Description	Comment
RiskFreeInterestRate	This field contains the risk free interest rate.	

4.7 Security Master Update

This is sent whenever the parameter of any security is changed. The structure is as follows:

SECURITY UPDATE INFORMATION

Structure Name: MS_SECURITY_UPDATE_INFO
Packet Length: 296 bytes
Transaction Code: BCAST_SECURITY_MSTR_CHG (7305)

```
STRUCT MESSAGE_HEADER (Refer to Message Header
                      in Section 1)
LONG      Token
STRUCT    SEC_INFO
    {
        CHAR  InstrumentName [6]
        CHAR  Symbol [10]
        CHAR  Series  [2]
        LONG  ExpiryDate
        LONG  StrikePrice
        CHAR  OptionType [2]
        SHORT CALevel
    }
SHORT     PermittedToTrade
DOUBLE    IssuedCapital
LONG      WarningQuantity
LONG      FreezeQuantity
CHAR      CreditRating [12]
```

Note: Use any one of following two ST_SEC_ELIGIBILITY_ PER_ MARKET structures:

For Small Endian Machines:

```
STRUCT   ST_SEC_ELIGIBILITY_ PER_ MARKET [ 4 ]
    {
        Reserved   : 7 BIT
        Eligibility   : 1 BIT
        SHORT     Status
    }
```

For Big Endian Machines:

```
STRUCT   ST_SEC_ELIGIBILITY_ PER_ MARKET [ 4 ]
```

```
        {
            Eligibility   : 1 BIT
            Reserved  : 7 BIT
            SHORT     Status
        }

     SHORT    IssueRate
     LONG     IssueStartDate
     LONG     InterestPaymentDate
     LONG     IssueMaturityDate
    LONG      MarginPercentage
    LONG      MinimumLotQuantity
    LONG      BoardLotQuantity
    LONG      TickSize
    CHAR      Name [25]
    Reserved 1 byte
    LONG      ListingDate
    LONG      ExpulsionDate
    LONG      ReAdmissionDate
    LONG      RecordDate
    LONG      LowPriceRange
    LONG      HighPriceRange
    LONG      ExpiryDate
    LONG      NoDeliveryStartDate
    LONG      NoDeliveryEndDate
```

Note: Use any one of following two ST_ELIGIBLITY_ INDICATORS structures:

For Small Endian Machines:

```
    STRUCT   ST_ELIGIBLITY_ INDICATORS
        {
            Reserved       :              5 BIT
            Minimum Fill   :              1 BIT
            AON            :              1 BIT
            Participate In Market Index: 1 BIT
            Reserved       :              1 byte
        }
```

For Big Endian Machines:

```
    STRUCT   ST_ELIGIBLITY_ INDICATORS
        {
            Participate In Market Index: 1 BIT
            AON            : 1 BIT
            Minimum Fill   : 1 BIT
            Reserved       : 5 BIT
            Reserved       : 1 byte
        }

    LONG      BookClosureStartDate
```

```
    LONG      BookClosureEndDate
    LONG      ExerciseStartDate
    LONG      ExerciseEndDate
    LONG      OldToken
    CHAR      AssetInstrument [ 6 ]
    CHAR      AssetName [ 10 ]
    LONG      AssetToken
    LONG      IntrinsicValue
    LONG      ExtrinsicValue
```

Note: Use any one of following two ST_ELIGIBLITY_ INDICATORS structures:

For Small Endian Machines:

```
    STRUCT   ST_PURPOSE
        {
            Exercise Style : 1 BIT
            Reserved       : 1 BIT
            EGM            : 1 BIT
            AGM            : 1 BIT
            Interest       : 1 BIT
            Bonus          : 1 BIT
            Rights         : 1 BIT
            Dividend       : 1 BIT
            Reserved       : 3 BIT
            Is Corporate Adjusted: 1 BIT
            Is This Asset  : 1 BIT
            Pl Allowed     : 1 BIT
            Ex Rejection Allowed: 1 BIT
            Ex Allowed     : 1 BIT
        }
```

For Big Endian Machines:

```
    STRUCT   ST_PURPOSE
        {
            Dividend       : 1 BIT
            Rights         : 1 BIT
            Bonus          : 1 BIT
            Interest       : 1 BIT
            AGM            : 1 BIT
            EGM            : 1 BIT
            Reserved       : 1 BIT
            Exercise Style : 1 BIT
            Ex Allowed     : 1 BIT
            Ex Rejection Allowed: 1 BIT
            Pl Allowed     : 1 BIT
            Is This Asset  : 1 BIT
            Is Corporate Adjusted: 1 BIT
            Reserved       : 3 BIT
        }
```

```
LONG  LocalUpdateDateTime
CHAR  DeleteFlag
CHAR  Remark [25]
LONG  BasePrice;
```

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_SECURITY_MSTR_CHG (7305).	
Token	This field contains the token number of the security being updated. This is unique for a particular symbol-series combination.	
SecurityInformation	This contains the Symbol and Series (EQ / IL / TT) of the security.	
PermittedToTrade	This field contains one of the following values. • '0' - Listed but not permitted to trade. • '1' - Permitted to trade.	
IssuedCapital	This field contains the issue size of the security.	
WarningQuantity	This field contains the warning quantity.	
FreezeQuantity	This field contains the freeze quantity.	
CreditRating	This field contains the credit rating of the security.	
Eligibility	The flag is set to '1' if the security is allowed to trade in a particular market.	
Status	This field contains one of the following values. '1' - Pre-open (Only for Normal market) '2' - Open '3' - Suspended '4' - Pre-open extended	

Field Name	Description	Comment
	‘5’ - Stock Open With Market	
IssueRate	This field contains the price of the issue.	
IssueStartDate	This field contains the date of issue of the security.	
InterestPaymentDate	This field contains the interest payment date of the issue.	
IssueMaturityDate	This field contains the maturity date.	
MarginPercent	This field contains the initial margin percent to be collected on a contract.	
MinimumLotQuantity	This field contains the minimum lot of the order which can be placed.	
BoardLotQuantity	This field contains the Regular lot size.	
TickSize	This field contains the Tick size/ Min spread size.	
Name	This field contains the security name.	
ListingDate	This field contains the date of listing.	
ExpulsionDate	This field contains the date of expulsion.	
ReAdmissionDate	This field contains the date of readmission.	
RecordDate	This field contains the date of record changed.	
LowPriceRange	This field contains the lower price limit of operating ranges.	
HighPriceRange	This field contains the upper price limit of operating ranges.	
ExpiryDate	This field contains the last date of trading before any corporate action.	
NoDeliveryStartDate	This field contains the date from when physical delivery of share certificates is stopped for book closure.	
NoDeliveryEndDate	This field contains the date from when physical delivery of share	

Field Name	Description	Comment
	certificates starts after book closure.	
MinimumFill	If this flag is set, the Minimum Fill attribute is allowed in orders in this security.	
AON	If this flag is set, the AON attribute is allowed in orders in this security.	
Participat InMarket Index	This flag is set if this security participates in the market index.	
BookClosureStartDate	This field contains the date when the record books in the company for shareholder names starts.	
BookClosureEnd Date	This field contains the date when the record books in the company for shareholder names ends.	
ExerciseStartDate	This field contains the starting date for Exercise.	
ExerciseEndDate	This field contains the last date for Exercise.	
OldToken	This field is not used.	
AssetInstrument	This field contains the underlying asset type, for example INDEX.	
AssetName	This field contains the name of the underlying asset, for example NIFTY.	
AssetToken	This field contains the token number of the asset.	
IntrinsicValue	This field contains the intrinsic value of the contract.	
ExtrinsicValue	This field contains the extrinsic value of the contract.	
Purpose	This field contains the EX STYLE / EGM / AGM / Interest / Bonus / Rights / Dividend flags set depending on the corporate action.	
LocalUpdateDateTime	This field contains the local database update date-time.	
DeleteFlag	This contains one of the following values to denote whether the security is deleted or not.	

Field Name	Description	Comment
	• 'N' – Active • 'Y' – Deleted	
Remark	This field contains the remarks.	
BasePrice	This field contains the base price of the stock.	

4.8 Change in Instrument Master

If a user is already logged in and if there is any change in the data then it is broadcast.

The structure received is as follows:

Structure Name: MS_INSTRUMENT_UPDATE_INFO
Packet Length: 76 bytes
Transaction Code: BCAST_INST_MSTR_CHG (7324)
struct MESSAGE_HEADER (Refer to *Message Header* in Section 1) short InstrumentId CHAR InstrumentName [6] CHAR InstrumentDescription [25] LONG InstrumentUpdateDateTime CHAR DeleteFlag

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_INST_MSTR_CHG (7324).	
InstrumentId	This field contains the ID of the instrument.	
InstrumentName	This field contains the type of the instrument.	For example, OPTIDX, OPTSTK,FUTIDX etc.
InstrumentDescription	This field contains the full name of the instrument.	For example, for Instrument Name OPTIDX, it will be OPTIONS ON INDEX.
InstrumentUpdateTime	This field contains the time when this record has been modified.	
DeleteFlag	This field contains one of the following values to denote whether the instrument is deleted or not. • 'Y' for deleted • 'N' for not deleted	

	(active)	

4.9 Change Participant Status

This message is sent whenever there is any participant change. The structure sent is:

Structure Name: PARTICIPANT_UPDATE_INFO
Packet Length: 81 bytes
Transaction Code: BCAST_PART_MSTR_CHG (7306)
STRUCT MESSAGE_HEADER (Refer to *Message Header* in Section 1) CHAR Participant Id [12] CHAR ParticipantName [25] CHAR ParticipantStatus LONG ParticipantUpdateDateTime CHAR DeleteFlag

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_PART_MSTR_CHG (7306).	
ParticipantId	This field contains the participant ID.	
ParticipantName	This field contains the name of the participant which has been changed.	
ParticipantStatus	This field contains one of the following values to denote the status of the participant which has been changed: • ‘S‘ – Suspended • ‘A’ – Active	
ParticipantUpdateDateTime	This field contains the time when the participant information was changed. It is in number of seconds from January 1, 1980	
DeleteFlag	This field contains one of the following values to indicate whether the	

Field Name	Description	Comment
	participant is deleted or not: • 'Y' for 'deleted' • 'N' for 'not deleted'	

4.10 Change of Security Status

This message is sent whenever the status of any security changes. The structure sent is:

SECURITY STATUS UPDATE INFORMATION

Structure Name: MS_SECURITY_STATUS_UPDATE_INFO

Packet Length: 460 bytes

Transaction Code: BCAST_STOCK_STATUS_CHG (7320) and BCAST_STOCK_STATUS_CHG_PREOPEN (7210)

```
STRUCT      MESSAGE_HEADER   (Refer to
              Message Header in Section 1)
SHORT       NumberOfRecords
STRUCT      TOKEN AND ELIGIBILITY [35]
    {
    LONG    Token
    ST_SEC_STATUS_PER_MARKET [4]
        {
        SHORT  Status
        }
    }
```

Field Name	Description	Comment
TransactionCode	The transaction codes are: BCAST_STOCK_STATUS_CHG (7320) and BCAST_STOCK_STATUS_CHG_PREOPEN (7210).	
NumberOfRecords	This field contains the number of times the structure TOKEN AND ELIGIBILITY is repeated.	
Token	This field contains the token number of the security which has been changed.	
Status	This field contains the new status of the security. This can take any of the following	

Field Name	Description	Comment
	values: '1' - Pre-open '2' - Open '3' - Suspended '4' - Pre-open extended	

4.11 Turnover Limit Exceeded or Broker Reactivated

When a broker's turnover limit exceeds, the broker is deactivated and a message is broadcast to all workstations. The same structure is also sent when any broker is reactivated. The structure is as follows:

Structure Name: MS_BROADCAST_LIMIT_EXCEEDED
Packet Length: 95 bytes
Transaction Code: BCAST_TURNOVER_EXCEEDED (9010) and BROADCAST_BROKER_REACTIVATED (9011)
BCAST_ HEADER (Refer to ***BCAST*** *Header* in Chapter 2) CHAR BrokerCode [5] CHAR CounterBrokerCode [5] SHORT WarningType CHAR Symbol [10] CHAR Series [2] LONG TradeNumber LONG TradePrice LONG TradeVolume CHAR Final

Field Name	Description	Comment
TransactionCode	The transaction codes are: 1. BCAST_TURNOVER_EXCEEDED (9010), if the broker turnover is about to exceed or has already exceeded. 2. BROADCAST_BROKER_REACTIVATED (9011), if the broker is reactivated after being	

Field Name	Description	Comment
	deactivated.	
BrokerCode	This field contains the code of broker who is about to exceed or has already exceeded his turnover limit.	
CounterBrokerCode	This field is not in use.	
WarningType	This field is applicable only if the transaction code is BCAST_TURNOVER_EXCEEDED. The value is set to '1' if the turnover limit is about to exceed, and '2' if turnover limit has been exceeded. In the latter case the broker has been deactivated	
Symbol	This field is applicable only if the transaction code is BCAST_TURNOVER_EXCEEDED. This contains the symbol of the security in which the broker has last traded.	
Series	This field is applicable only if the transaction code is BCAST_TURNOVER_EXCEEDED. This contains the series of the security.	
TradeNumber	This field is applicable only if the transaction code is BCAST_TURNOVER_EXCEEDED. This contains the trade number in which the broker has last traded.	
TradePrice	This field is applicable only if the Transaction code is BCAST_TURNOVER_EXCEEDED. This contains the price of the trade.	
TradeVolume	This field is applicable only if the Transaction code is BCAST_TURNOVER_EXCEEDED. This contains the trade quantity of the trade.	
Final	This field is applicable only if the transaction code is BCAST_TURNOVER_EXCEEDED. This indicates whether it is the final auction trade.	

4.12 Change of Market Status

Sequence of the Market open messages:

Following message codes will be sent as a part of regular (first) market opening

- BC_OPEN_MSG (6511). This is sent when the market is opened.

Following message codes will still be sent, in case of Market opening for the second time during the day e.g. during sun outage, circuit hit

- BC_PRE_OR_POST_DAY_MSG (6531). This is sent when the market is preopened.
- BC_PRE_OPEN_ENDED (6571). This is sent when the pre-open period ends.
- BC_OPEN_MSG (6511). This is sent when the market is opened.

Whenever the status of the market changes, the following structure is sent:

BCAST_VCT_MESSAGES

Structure Name: STRUCT MS_BCAST_VCT_MSGS
Packet Length: 318 bytes
Transaction Code: Refer to the table given below.

STRUCT BCAST_HEADER (Refer to *BCAST Header* in Section 1)
LONG Token
STRUCT SEC_INFO
{
CHAR InstrumentName[6]
CHAR Symbol [10]
CHAR Series [2]
LONG ExpiryDate
LONG StrikePrice
CHAR OptionType[2]
SHORT CA Level
}
SHORT MarketType
Note: Use any one of following two ST_BCAST_DESTINATION structures:
 	
For Big Endian Machines:
STRUCT ST_BCAST_DESTINATION
{
Reserved : 4 BIT
Journaling Required : 1 BIT
Tandem : 1 BIT
Control Workstation : 1 BIT
Trader Workstation : 1 BIT
Reserved : 1 byte
}
 	
For Big Endian Machines:
STRUCT ST_BCAST_DESTINATION
{
Trader Workstation : 1 BIT
ControlWorkstation : 1 BIT

```
                Tandem              : 1 BIT
                Journaling Required: 1 BIT
                Reserved            : 4 BIT
                Reserved            : 1 byte
            }

        SHORT    BroadcastMessageLength
        CHAR     BroadcastMessage [239]
```

Field Name	Description	Comment
TransactionCode	BC_OPEN_MSG (6511). This is sent when the market is opened. BC_CLOSE_MSG (6521). This is sent when the market is closed. BC_PRE_OR_POST_DAY_MSG (6531). This is sent when the market is preopened. BC_PRE_OPEN_ENDED (6571). This is sent when the pre-open period ends. EQUAL BC_POSTCLOSE_MSG (6522). This is sent when the Market is in Postclose session.	
SecurityInformation	This field contains the symbol and series of a security.	
MarketType	This field contains the value to indicate the type of market. • '1' for Normal • '2' for Odd Lot • '3' for Spot • '4' for Auction	
BroadcastDestination	This field, if set to '1', specifies that the message is for the TWS.	
BroadcastMessage Length	This field contains the length of the broadcast message.	
BroadcastMessage	This field contains the contents of the broadcast message.	

In addition : To identify the category of the market in the message, the existing field 'AlphaChar' in the broadcast message header (BCAST_HEADER) of the message structure MS_BCAST_VCT_MSG, will contain values as indicated below

Field Name	Description	Comment
AlphaChar	This field in will have information to indicate the market category	"TD": Normal Market 'EX" : Exercise "S1": Regular category "S2": Extended category

4.13 Ticker and Market Index

Ticker and market index information is sent in the following structure:

Structure Name: MS_TICKER_TRADE_DATA
Packet Length: 482 bytes
Transaction Code: BCAST_TICKER_AND_MKT_INDEX (7202)

MESSAGE_HEADER (Refer to *Message Header* in Section 1)
SHORT Number of Records
STRUCT ST_TICKER_INDEX_INFO [17]
{
LONG Token
SHORT MarketType
LONG FillPrice
LONG FillVolume
LONG OpenInterest
LONG DayHiOI
LONG DayLoOI
}

Field Name	Description	Comment
TransactionCode	The transaction code sent is BCAST_TICKER_AND_MKT_INDEX (7202).	
NumberOfRecords	This field contains the number of times (maximum 17) the structure TICKER INDEX INFORMATION is repeated.	
Token	This field contains the token number which is a unique number given to a particular symbol-series	

Field Name	Description	Comment
	combination.	
MarketType	This field contains the type of market.	
FillPrice	This field contains the price at which the order has been traded.	
FillVolume	This field contains the quantity of security traded.	
Openinterest	This field contains the value of open interest.	
DayHiOi	This field contains the feed of highest open interest value of the day.	
DayLoOi	This field contains the feed of lowest open interest value of the day.	

4.14 Market by Order/Market by Price Update

The information regarding the best buy orders and the best sell orders is given in the following format.

BROADCAST MBO MBP

Structure Name: MS_BCAST_MBO_MBP
Packet Length: 388 bytes
Transaction Code: BCAST_MBO_MBP_UPDATE (7200)
MESSAGE_ HEADER (Refer to Message Header Section in Chapter 1) STRUCT ST_INTERACTIVE_MBO_DATA { LONG Token SHORT BookType SHORT TradingStatus LONG VolumeTradedToday LONG LastTradedPrice CHAR NetChangeIndicator LONG NetPriceChangeFromClosingPrice LONG LastTradeQuantity LONG LastTradeTime LONG AverageTradePrice SHORT AuctionNumber SHORT AuctionStatus SHORT InitiatorType LONG InitiatorPrice

```
                    LONG        InitiatorQuantity
                    LONG        AuctionPrice
                    LONG        AuctionQuantity
                    CHAR        RecordBuffer [sizeof (ST_MBO_INFO) * 10]
                            {
                                SHORT TraderId
                                 LONG  Qty
                                 LONG  Price

                                Note: Use any one of following two
                                ST_MBO_MBP_TERMS structures

                                For Small Endian Machines:
                                STRUCT ST_MBO_MBP_TERMS
                                        {
                                    Reserved   : 6 BIT
                                    AON        : 1 BIT
                                    MF         : 1 BIT
                                    Reserved   : 1 byte
                                 }

                                For  Endian Machines:
                                STRUCT ST_MBO_MBP_TERMS
                                        {
                                  MF           : 1 BIT
                                  AON          : 1 BIT
                                  Reserved     : 6 BIT
                                  Reserved     : 1 byte
                                 }

                                        LONG Min Fill Qty
                                }
                            }
                }
            CHAR        Record Buffer [sizeof (ST_MBP_INFO) * 10]
                {
                    LONG  Qty
                    LONG  Price
                    SHORT NoOfOrders
                }
            DOUBLE   Total Buy Quantity
            DOUBLE   Total Sell Quantity
```

Note: Use any one of following two ST_MBO_MBP_TERMS structures:

For Small Endian Machines:

```
            STRUCT   ST_INDICATOR
                {
                    Reserved            : 4 BIT
```

```
                Sell               : 1 BIT
                Buy                : 1 BIT
                Last Trade Less    : 1 BIT
                Last Trade More    : 1 BIT
                Reserved           : 1 byte
            }

For Big Endian Machines:
        STRUCT   ST_INDICATOR
            {
                Last Trade More    : 1 BIT
                Last Trade Less    : 1 BIT
                 Buy               : 1 BIT
                Sell               : 1 BIT
                Reserved           : 4 BIT
                Reserved           : 1 byte
            }

        LONG      ClosingPrice
        LONG      OpenPrice
        LONG      HighPrice
        LONG      LowPrice
}

//END OF MS_BCAST_MBO_MBP
```

Field Name	Description	Comment
TransactionCode	The transaction code set for the purpose is BCAST_MBO_MBP_UPDATE (7200).	
Token	This field contains the token number which is a unique number given to a particular symbol-series combination.	
BookType	This field contains the book type—RL / ST / OL/ SP / AU **Book Type** **Market** ‘1’ RL ‘2’ ST ‘5’ OL ‘6’ SP ‘7’ AU	Process the message only if book type is ‘1’ or ‘2’. In other cases, skip it.
TradingStatus	This field contains the trading status of the security.	

Field Name	Description	Comment
	• ‘1’ – Preopen • ‘2’ – Open • ‘3’ – Suspended • ‘4’ – Preopen Extended	
VolumeTradedToday	This field contains the total quantity of a security traded on the current day.	
LastTradedPrice	This field contains the price at which the latest trade in a security has taken place.	
NetChangeIndicator	This is a flag which indicates any change of the order price from the LTP. • ‘+’ for increase • ‘-’ for decrease	
NetPriceChangeFromtheClosingPrice	This field contains the net change between the closing price and the LTP. Presently it contains the closing price same as that of the Closing Price field mentioned subsequently. Since in this MBO/MBP packet both LTP and closing price is being sent it is for the front end to calculate the value of Net Price Change from the Closing Price by the formula ((closing price – LTP)/closing price)*100.	
LastTradeQuantity	This field contains the quantity at which the last trade took place in a security.	
LastTradeTime	This field contains the time when the last trade took place in a security.	
AverageTradePrice	This field contains the average price of all the trades in a security.	
AuctionNumber	This field contains the auction number. The maximum value this can take is 9999. Other	

Field Name	Description	Comment
	than auction it is set to zero.	
AuctionStatus	Refer to *Appendix*.	
InitiatorType	This field contains the initiator type—control or trader. Presently initiator type is control, since only the Exchange can initiate an Auction. Otherwise it is set to blank.	
InitiatorPrice	This field contains the price of the security of the initiator's auction order. Otherwise it is set to zero.	
InitiatorQuantity	This field contains the quantity of the security of the initiator's auction order. Otherwise it is set to zero.	
AuctionPrice	This field contains the price at which auction in a security takes place. Otherwise it is set to zero.	
AuctionQuantity	This field contains the quantity at which auction in a security takes place. Otherwise it is set to zero.	
RecordBuffer (MBO INFORMATION)	This field contains the five best Buy orders and five best Sell orders from the order book.	
RecordBuffer (MBP INFORMATION)	This field contains the five best Buy prices and five best Sell prices from the order book.	
TotalBuyQuantity	This field contains the total quantity of buy orders in a security.	
TotalSellQuantity	This field contains the total quantity of sell orders in a security.	
Indicator	This field contains flags which are set to indicate Buy, Sell and Latest trade less than or greater than the immediately previous LTP.	

Field Name	Description	Comment
ClosingPrice	This field contains the closing price of a security.	
OpenPrice	This field contains the open price of a security.	
HighPrice	This field contains the highest trade price.	
LowPrice	This field contains the lowest trade price.	

4.15 Only Market by Price Update

The information regarding the best buy orders and the best sell orders is given in the following format:

BROADCAST ONLY MBP

Structure Name: MS_BCAST_ONLY_MBP
Packet Length: 468 bytes
Transaction Code: BCAST_ONLY_MBP (7208)

```
MESSAGE_ HEADER (Refer to Message Header in Section 1)
  SHORT   NoOfRecords
 INTERACTIVE  ONLY MBP  DATA  [2]
 {
      LONG      Token
      SHORT     BookType
      SHORT     TradingStatus
      LONG      VolumeTradedToday
      LONG      LastTradedPrice
      CHAR      NetChangeIndicator
      LONG      NetPriceChangeFromClosingPrice
      LONG      LastTradeQuantity
      LONG      LastTradeTime
      LONG      AverageTradePrice
      SHORT     AuctionNumber
      SHORT     AuctionStatus
      SHORT     InitiatorType
      LONG      InitiatorPrice
      LONG      InitiatorQuantity
      LONG      AuctionPrice
      LONG      AuctionQuantity
      CHAR      RecordBuffer [ sizeof (   MBP INFORMATION  ) * 10 ]
      SHORT     BbTotalBuyFlag
      SHORT     BbTotalSellFlag
      DOUBLE    TotalBuyQuantity
      DOUBLE    TotalSellQuantity
```

```
Note: Use any one of following two MBP_INDICATOR structures:

    For Small Endian Machines:
            STRUCT   ST_INDICATOR
                {
                    Reserved           : 4 BIT
                    Sell               : 1 BIT
                    Buy                : 1 BIT
                    Last Trade Less    : 1 BIT
                    Last Trade More    : 1 BIT
                    Reserved           : 1 byte
                }

    For Big Endian Machines:
            STRUCT   ST_INDICATOR
                {
                    Last Trade More    : 1 BIT
                    Last Trade Less    : 1 BIT
                    Buy                : 1 BIT
                    Sell               : 1 bit
                    Reserved           : 4 BIT
                    Reserved           : 1 byte
                }

             LONG  ClosingPrice
             LONG  OpenPrice
             LONG  HighPrice
             LONG  LowPrice
        }
    } End of  MS_BCAST_ONLY_MBP
```

Structure Name: MBP INFORMATION
LONG Quantity LONG Price SHORT NumberOfOrders SHORT BbBuySellFlag

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_ONLY_MBP (7208).	
NoOfRecords	This field contains the number of securities sent.	
Token	This field contains the token number	

Field Name	Description	Comment
	which is a unique number given to a particular symbol-series combination.	
BookType	This field contains indicates the book type—RL / ST / SL / NT / OL/ SP Refer to *Book Types* in Appendix	
TradingStatus	This field contains the trading status of the security. It can be one of the following: • '1' – Preopen • '2' – Open • '3' – Suspended • '4' – Preopen Extended	
VolumeTradedToday	This field contains the total quantity of a security traded on the current day.	
LastTradedPrice	This field contains the price at which the latest trade in a security has taken place.	
NetChangeIndicator	This is a flag which indicates any change of the order price from the LTP: • '+' for increase • '-' for decrease	
NetPriceChange	This field contains the net change between the closing price and the LTP. Presently it contains the closing price same as that of the Closing Price field mentioned subsequently. Since in this MBP packet both LTP and closing price are being sent it is for the front end to calculate the value of Net Price Change from the Closing Price by the formula ((closing price – LTP)/closing price)*100.	
LastTradeQuantity	This field contains the quantity at which the last trade took place in a security.	
LastTradeTime	This field contains the time when the last trade took place in a security.	
AverageTradePrice	This field contains the average price of all the trades in a security.	
AuctionNumber	This field contains the auction number.	

Field Name	Description	Comment
	Currently it is not in use.	
AuctionStatus	Refer to *Appendix*.	
InitiatorType	This field contains the initiator type—control or trader. Presently initiator type is control, since only the Exchange can initiate an auction. Otherwise it is set to blank.	
InitiatorPrice	This field contains the price of the security of the initiator's auction order. Otherwise it is set to zero.	
InitiatorQuantity	This field contains the quantity of the security of the initiator's auction order. Otherwise it is set to zero.	
AuctionPrice	This field contains the price at which auction in a security takes place. Otherwise it is set to zero.	
AuctionQuantity	This field contains the quantity at which auction in a security takes place. Otherwise it is set to zero.	
RecordBuffer (MBP INFORMATION)	This field contains the five best Buy prices and five best Sell prices from the order book.	
BbTotalbuyFlag	This field, currently, contains a value of zero, since buy back concept is not implemented.	
BbTotalsell Flag	This field, currently, contains a value of zero, since buy back concept is not implemented.	
TotalBuyQuantity	This field contains the total quantity of buy orders in a security.	
TotalSellQuantity	This field contains the total quantity of sell orders in a security.	
Indicator	This field contains flags which are set to indicate Buy, Sell and Latest trade less than or greater than the immediately previous LTP.	
ClosingPrice	This field contains the closing price of a security.	
OpenPrice	This field contains the open price of a security.	
HighPrice	This field contains the highest trade	

Field Name	Description	Comment
	price.	
LowPrice	This field contains the lowest trade price.	
MBPInformation	This field contains the quantity, price and number of orders for a maximum of five best prices.	

4.16 Market Watch Update

The market watch information gives the best buy order and its quantity, best sell order and its quantity and the last trade price. The structure sent for the purpose is:

Structure Name: MS_BCAST_INQ_RESP_2
Packet Length: 600 bytes
Transaction Code: BCAST_MW_ROUND_ROBIN (7201)

```
STRUCT MESSAGE_HEADER (Refer to Message Header
                                 in Section 1)
    SHORT    Number of Records
    STRUCT    ST_MARKET_WATCH_BCAST [5]
        {
            LONG        Token
            STRUCT ST_MKT_WISE_INFO [3]
            {
                STRUCT ST_INDICATOR
                LONG  BuyVolume
                LONG  BuyPrice
                LONG  SellVolume
                LONG  SellPrice
                LONG  LastTradePrice
                LONG  LastTradeTime
            }
            LONG        OpenInterest
        }
```

Field Name	Description	Comment
TransactionCode	The transaction code sent is BCAST_MW_ROUND_ROBIN (7201).	
NumberofRecords	This field contains the number of times the structure MARKET WATCH BROADCAST is repeated.	

Field Name	Description	Comment
Token	This field contains the token number which is a unique number given to a particular symbol-series combination.	
Indicator	This field contains flags which are to indicate Buy, Sell and Last trade less than or greater than previous LTP.	
BuyVolume	This field contains the quantity of the best Buy order.	
BuyPrice	This field contains the price of the best Buy order.	
SellVolume	This field contains the quantity of the best Sell order.	
SellPrice	This field contains the price of the best Sell order.	
LastTradePrice	This field contains the latest trade price of a security.	
LastTradeTime	This field contains the latest trade time of a security.	
OpenInterest	This field contains the feed of Open Interest.	

4.17 Security Open Message

When the market opens the open price of the security is sent in the following structure:

Structure Name: MS_SEC_OPEN_MSGS
Packet Size : 62 bytes
Transaction Code: SECURITY_OPEN_PRICE (6013).
STRUCT MESSAGE_HEADER (Refer to *Message Header* in Chapter 1) CHAR Symbol [10] CHAR Series [2] LONG Token LONG OpeningPrice Reserved 4 BIT

Field Name	Description	Comment
TransactionCode	The transaction code is SECURITY_OPEN_PRICE (6013).	

Security Information	This field contains the symbol and series for a particular security.	
Token	This field contains the token number which is a unique number given to a particular symbol-series combination.	
OpeningPrice	This field contains the open price of the security.	

4.18 Broadcast Circuit Check

If there has been no data on the broadcast circuit for a stipulated time period then a pulse is sent. This time now is 9 sec but it can be changed by the NSE control. This is just to intimate that the circuit is still there but there is no data to send. The structure sent is:

MESSAGE_HEADER (Refer to *Message Header* in Chapter 1)

Field Name	**Description**	**Comment**
TransactionCode	The transaction code is BCAST_CIRCUIT_MSG (6541).	

4.19 Multiple Index Broadcast

This is a multiple index broadcast. It will be coming through Cash broadcast circuit. It sends the broadcast structure as follows:

Structure Name: MS_BCAST_INDICES
Packet Length: 440 bytes
Transaction Code: BCAST_INDICES (7207)

```
STRUCT      MESSAGE_HEADER (Refer to Message Header in Chapter 1)
SHORT       NumberOfRecords
STRUCT      MS_INDICES [15]
  {
        CHAR    IndexName [21]
        LONG    IndexValue
        LONG    HighIndexValue
        LONG    LowIndexValue
        LONG    OpeningIndex
        LONG    ClosingIndex
        LONG    PercentChange
        LONG    YearlyHigh
        LONG    YearlyLow
```

```
                    LONG     NoOfUpmoves
                    LONG     NoOfDownmoves
          DOUBLE       Market Capitalisation
          CHAR         NetChangeIndicator
          Reserved 1 byte
            }
```

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_INDICES (7207).	
NoofRecords	This field contains the number of indices currently supported by the system. Depending upon this number there will be records filled up in subsequent INDICES structure	
Indices	This is an array of structure. Number of records field shows how many records this structure will contain. The attributes of the structure are described subsequently.	
IndexName	This field contains the name of the index.	For example, Defty, Nifty
IndexValue	This field contains on line market index value at that instance of broadcast.	
HighIndexValue	This field contains the day's highest index value.	
LowIndexValue	This field contains the day's lowest index value.	
OpeningIndex	This field contains the opening index value when market opens.	
ClosingIndex	This field, if market is open, contains the previous day's closing index. After day's batch processing is over this field contains today's close.	
PercentChange	This field contains percentage change in current index with respect to yesterday's closing index.	
YearlyHigh	This field contains the highest index in the year.	
YearlyLow	This field contains the lowest index in the year.	
Noofupmoves	This field contains the number of time index has moved up with respect to	

Field Name	Description	Comment
	previous index.	
Noofdownmoves	This field contains the number of time index has moved down with respect to previous index.	
MarketCapitalization	This field contains the Market Capitalization of securities participating in that index.	
NetChangeIndicator	This field contains one of the following values. • '+' – if the current index is greater than previous index • '-' – if the current index is less than previous index. • ' ' – if the current index is equal to previous index	

4.20 Industry Index Broadcast

It will be coming through Cash (Capital Market) broadcast circuit. It sends the Index structure as follows:

Structure Name: MS_BCAST_INDUSTRY_INDICES
Packet Length: 440 bytes
Transaction Code: BCAST_INDUSTRY_INDEX_UPDATE (7203)
BCAST_ HEADER (Refer to Message Header in Chapter 1) SHORT NoOfRecs struct INDUSTRY_INDICES { CHAR IndustryName [15] LONG IndexValue } sIndustry [20]

Field Name	Description	Comment
TransactionCode	The transaction code is BCAST_INDUSTRY_INDEX_UPDATE (7203).	
NoofRecords	This field contains the number of indices currently supported by the system. Depending upon this number, there will be records filled up in subsequent	

	INDUSTRY_INDICES structure.	
Industry	This is an array of structure. Number of records field shows how many records this structure will contain. This structure has the attributes of Industry Name and Index Value.	
IndustryName	This field contains the name of the index.	For example, Defty, Nifty
IndexValue	This field contains the on line market index value at the time of log-on.	

4.21 Spread Combination master update broadcast

The structure of spread combination information (MS_SPD_UPDATE_INFO) is given below

Structure Name: MS_SPD_UPDATE_INFO
Packet Length: 130 bytes
Transaction Code: BCAST_SPD_MSTR_CHG (7309)

```
{
 struct MESSAGE_HEADER
          CHAR     iApiTcode
          CHAR     iApiFuncId
          LONG     LogTime
          CHAR     AlphaChar [2]
          SHORT    TransactionCode
          SHORT    ErrorCode
          CHAR     Timestamp [8]
          CHAR     TimeStamp1 [8]
          CHAR     TimeStamp2 [8]
          SHORT    MessageLength

          LONG     Token1
          LONG     Token2

struct SEC_INFO  SecInfo1
         {
          CHAR  InstrumentName [6]
          CHAR  Symbol [10]
          CHAR  Series  [2]
          LONG  ExpiryDate
          LONG  StrikePrice
          CHAR  OptionType [2]
```

```
                SHORT CALevel
              }
struct   SEC_INFO  SecInfo2
              {
                CHAR  InstrumentName [6]
                CHAR  Symbol [10]
                CHAR  Series  [2]
                LONG  ExpiryDate
                LONG  StrikePrice
                CHAR  OptionType [2]
                SHORT CALevel
              }
LONG     ReferencePrice
LONG    DayLowPriceDiffRange
LONG    DayHighPriceDiffRange
LONG    OpLowPriceDiffRange
LONG    OpHighPriceDiffRange

Note: Use any one of following two
ST_SPD_ELIGIBILITY structures:

For Small Endian Machines:
      STRUCT   ST_SPD_ELIGIBILITY
            {
                Reserved   : 7 bits
                Eligibility    : 1 bit
            }

For Big Endian Machines:
      STRUCT   ST_SPD_ELIGIBILITY
            {
                Eligibility    : 1 bit
                Reserved   : 7 bits
            }

CHAR       Reserved
CHAR       DeleteFlag
CHAR       Reserved
}
```

Field Name	Description	Comments
Transaction Code	BCAST_SPD_MSTR_CHG (7309)	
SecurityInformation1	This will contain instrument	

	name, symbol, series, strike price, option type and corporate action level of leg 1 contract	
SecurityInformation2	This will contain instrument name, symbol, series, strike price, option type and corporate action level of leg 2 contract	
ReferencePrice	Settlement price of leg 1 contract which will be the base for calculating price difference ranges	
DayLowPriceDiffRange	Day low price difference range for the combination	
DayHighPriceDiffRange	Day high price difference range for the combination	
OpLowPriceDiffRange	Operating low price difference range for the combination	
OpHighPriceDiffRange	Operating high price difference range for the combination	
Eligibility	The flag will be set to 1 if the combination is allowed to trade.	
DeleteFlag	This will contain one of the following values to denote whether the spread combination is deleted or not. • ‘N‘ – Active • ‘Y’ – Deleted	

4.22 Spread Market by Price

It comes through the broadcast circuit and if broadcast is not available it comes through the interactive circuit. This is broadcast for every activity occurring. The structure is as follows:

Structure Name: MS_SPD_MKT_INFO
Packet Length: 202 bytes
Transaction Code: BCAST_SPD_MBP_DELTA (7211)
BCAST_ HEADER Reserved 1 byte Reserved 1 byte LONG LogTime CHAR AlphaChar [2] SHORT TransCode SHORT ErrorCode LONG BCSeqNo Reserved 1 byte Reserved 3 byte CHAR TimeStamp2 [8] BYTE Filler2 [8] SHORT MessageLength Struct { Long Token1 Long Token2 Short MbpBuy Short MbpSell Long LastActiveTime Long TradedVolume Double TotalTradedValue struct { Short NoOrders Long Volume Long Price } MbpBuys [5] struct { Short NoOrders Long Volume Long Price

```
    } MbpSells [5]
struct
                {
    Double Buy
    Double Sell
    }TotalOrderVolume

    Long    OpenPriceDifference
    Long    DayHighPriceDifference
    Long    DayLowPriceDifference
    Long    LastTradedPriceDifference
    Long    LastUpdateTime

} BcastData
```

Field Name	**Description**	**Comments**
TransactionCode	The transaction code is BCAST_SPD_MBP_DELTA (7211).	
Token1	This field will contain the token number of the security with early expiry date.	
Token2	This field will contain the token number of the security with later expiry date.	
MBPbuy	This field will contain the total number of buys for that particular combination.	
MBPsell	This field will contain the total number of sells for that particular combination.	
LastActiveTime	This field will contain the time stamp at which the last activity was done.	
Tradedvolume	This field will contain the total traded volume	
TotalTradedValue	This field will contain the total value of trades happened on that particular combination	
MBPBuys	This is an array of five, consisting of five best buy orders for the particular combination. It has the following fields: • NoOrders which will contain the	

Field Name	Description	Comments
	number of orders with the same price. • Volume which will contain the total volume ordered with the same price. • Price which will contain the price of the orders.	
MBPSells	This is an array of five, consisting of five best sell orders for the particular combination. It has the following fields: • NoOrders which will contain the number of orders with the same price. • Volume which will contain the total volume ordered with the same price. • Price which will contain the price of the orders.	
TotalOrderVolume	This structure is made of the following fields: • Buy which will contain the total buy volume ordered for the particular combination. • Sell which will contain the total sell volume ordered for the particular combination.	
OpenPriceDifference	This field will contain price difference of the first spread-spread trade of the day	
DayHighPriceDifference	This field will contain maximum of the price difference of spread-spread trades during the day	
DayLowPriceDifference	This field will contain minimum of the price difference of spread-spread trades during the day	
LastTradedPriceDifference	This field will contain price difference of the latest spread-spread trade	
LastUpdateTime	This field will contain the time stamp at which the last activity was done. This	

Field Name	Description	Comments
	will be same as LastActiveTime.	

4.23 Underlying Open Interest

This information is sent for the open interest of the underlying asset.

The structure sent is as follows:

Structure Name: CM_ASSET_OI
Packet Length: 502 bytes
Transaction Code: MKT_MVMT_CM_OI_IN (7130)
Reserved 1 byte Reserved 1 byte LONG LogTime CHAR MarketType [2] SHORT TransactionCode SHORT NoOfRecords Reserved 8 byte CHAR TimeStamp [8] Reserved 8 byte SHORT MessageLength Struct OPEN INTEREST [58]

Structure Name: OPEN INTEREST
Packet Length: 8 bytes
LONG Token No LONG CurrentOi

Field Name	Description	Comment
TransactionCode	The transaction code is MKT_MVMT_CM_OI_IN (7130).	
LogTime	This field should be set to zero while sending messages to the host end. For messages coming from the host, this contains the time the message was generated by the trading system.	
MarketType	It contains the Market Type for the transaction code	

Field Name	Description	Comment
	MKT_MVMT_CM_OI_IN.	
NoOfRecords	It contains the number of times (maximum 58) the OPEN INTEREST is repeated.	
TimeStamp	This field contains the time when the message (reply) is sent from the host.	
TokenNumber	This field contains the token number of the underlying asset.	
CurrentOI	This field contains the Current Open Interest of the underlying asset.	

4.24 Identification for Market Wide Open Interest (OI) Limit Messages

Market wide OI limit messages are sent from the exchange in the general broadcast message structure BCAST_JRNL_VCT_MSG, transaction code 6501. Other general messages are also sent in this structure.

To identify the Market wide OI Limit broadcast messages, a new action code is defined with value 'MWL' in the field ActionCode of the current structure . There is no structure change to accommodate this change.

Structure for General Broadcast Message BCAST_JRNL_VCT_MSG (6501)

Structure Name: MS_BCAST_MESSAGE
Packet Length: 295 bytes
Transaction Code: BCAST_JRNL_VCT_MSG (6501)
STRUCT MESSAGE_HEADER (Refer to *Message Header* in Chapter 2) SHORT BranchNumber CHAR BrokerNumber [5] CHAR ActionCode [3] STRUCT ST_BCAST_DESTINATION Reserved 26 byte **Note:** Use any one of following two ST_BCAST_DESTINATION structures: **For Small Endian Machines**

```
        STRUCT   ST_BCAST_DESTINATION
            {
                Reserved             : 4 BIT
                Journaling Required: 1 BIT
                Tandem               : 1 BIT
                ControlWorkstation : 1 BIT
                Trader Workstation : 1 BIT
                Reserved             : 1 byte
            }
```

For Big Endian Machines

```
        STRUCT   ST_BCAST_DESTINATION
            {
                Trader Workstation : 1 BIT
                ControlWorkstation : 1 BIT
                Tandem               : 1 BIT
                Journaling Required: 1 BIT
                Reserved            : 4 BIT
                Reserved            : 1 byte
            }

        SHORT    BroadcastMessageLength
        CHAR     BroadcastMessage [239]
```

Field Name	Description	Comment
TransactionCode	The transaction code is: BCAST_JRNL_VCT_MSG (6501).	
BranchNumber	This field contains the branch number of the trader to which he belongs.	
BrokerNumber	This field contains the Trading Member ID of the broker.	
ActionCode	This field contains the action code which indicates the action taken.	For example, 'SYS' - system 'LIS' - Listing 'MWL' – Market Wide OI Limit Message
Broadcast Destination	This field specifies the destination of the message, that is, Trader Workstation or Control Workstation.	
Broadcast MessageLength	This field contains the length of the broadcast message.	
BroadcastMessage	This field contains the broadcast message.	

4.25 Identification for Member Violation Messages

Member specific messages like; change in trading status of the member, violation messages, trade modification request notification etc, are sent from Exchange in the structure 'CTRL_MSG_TO_TRADER' (transaction code - 5295).

To identify the Member Violation messages a new field is defined as 'ActionCode' in 'CTRL_MSG_TO_TRADER' (5295) structure. To define this new field, the reserved bytes existing in the structure are used. For Violation messages the value of 'action code' field will be "MAR".

Structure for Trader specific messages CTRL_MSG_TO_TRADER(5295)

(Existing reserved 3 bytes replaced with action code field)

Structure Name: MS_TRADER_INT_MSG
Packet Size: 285 bytes
Transaction Code: For interactive messages—CTRL_MSG_TO_TRADER (5295).
MESSAGE_HEADER (Refer to *Message Header* in Chapter 2) SHORT TraderId CHAR ActionCode [3] Reserved 1 byte SHORT BroadCastMessage Length CHAR BroadCastMessage [239]

Field Name	Description	Comment
TraderId	User Id to whom the message belongs to	
ActionCode	This field contains the action code which indicates the action taken.	For example, 'MAR' – Margin Violation Message 'OTH' – Other Messages
BroadCastMessage Length	Message Length	
BroadCastMessage	Message	

4.26 Appendix A

4.27 List of transaction codes:

Transaction Code	**Code**	**Structure**	**Size**	**I/B***
BCAST_SPD_MBP_DELTA	7211	MS_SPD_MKT_INFO	186	B
RPRT_MARKET_STATS_OUT_RPT	1833	MS_RP_MARKET_STATS REPORT_TRAILER REPORT_HEADER	486 44 104	B
BCAST_JRNL_VCT_MSG	6501	MS_TRADER_INT_MSG	285	B
BC_OPEN_MESSAGE	6511	MS_BCAST_VCT_MSGS	318	B
BC_CLOSE_MESSAGE	6521	MS_BCAST_VCT_MSGS	318	B
BC_PREOPEN_SHUTDOWN_MSG	6531	MS_BCAST_VCT_MSGS	318	B
BC_CIRCUIT_CHECK	6541	MESSAGE_HEADER	38	B
BC_NORMAL_MKT_PREOPEN_ENDED	6571	MS_BCAST_VCT_MSGS	318	B
BCAST_MW_ROUND_ROBIN	7201	MS_FO_BCAST_INQ_RESP_2	470	B
BCAST_TICKER_AND_MKT_INDEX	7202	MS_FO_TICKER_TRADE_DATA	482	B
BCAST_INDUSTRY_INDEX_UPDATE	7203	MS_BCAST_INDUSTRY_INDICES		B
BCAST_SYSTEM_INFORMATION_OUT	7206	MS_SYSTEM_INFO_DATA	103	B
BCAST_SECURITY_STATUS_CHG_PREOPEN	7210	MS_SECURITY_STATUS_UPDATE_INFO	496	B
BCAST_SECURITY_MSTR_CHG	7305	MS_SECURITY_UPDATE_INFO	296	B/I
BCAST_PART_MSTR_CHG	7306	PARTICIPANT_UPDATE_INFO	82	B
BCAST_SECURITY_STATUS_CHG	7320	MS_SECURITY_STATUS_UPDATE_INFO	496	B

Transaction Code	Code	Structure	Size	I/B*
BCAST_ONLY_MBP	7208	MS_BCAST_ONLY_MBP	468	B
RPRT_MARKET_STATS_OUT_RPT	1833	MS_RP_MARKET_STATS REPORT_TRAILER REPORT_HEADER	486 44 104	B
BCAST_SPD_MBP_DELTA	7211	MS_SPD_MKT_INFO	186	B
SECURITY_OPEN_PRICE	6013	MS_SEC_OPEN_MSGS	58	B
BCAST_JRNL_VCT_MSG	6501	MS_TRADER_INT_MSG	285	B
BC_OPEN_MESSAGE	6511	MS_BCAST_VCT_MSGS	318	B
BC_CLOSE_MESSAGE	6521	MS_BCAST_VCT_MSGS	318	B
BC_PREOPEN_SHUTDOWN_MSG	6531	MS_BCAST_VCT_MSGS	318	B
BC_CIRCUIT_CHECK	6541	MESSAGE_HEADER	38	B
BC_NORMAL_MKT_PREOPEN_ENDED	6571	MS_BCAST_VCT_MSGS	318	B
DOWNLOAD_REQUEST	7000	MS_MESSAGE_DOWNLOAD	46	I
HEADER_RECORD	7011	MESSAGE_HEADER	38	I
MESSAGE_RECORD	7021	MESSAGE_HEADER	38	I
TRAILER_RECORD	7031	MESSAGE_HEADER	38	I
MKT_MVMT_CM_OI_IN	7130	CM_ASSET_OI	500	B
BCAST_MW_ROUND_ROBIN	7201	MS_FO_BCAST_INQ_RESP_2	470	B
BCAST_TICKER_AND_MKT_INDEX	7202	MS_FO_TICKER_TRADE_DATA	482	B
BCAST_INDUSTRY_INDEX_UPDATE	7203	MS_BCAST_INDUSTRY_INDICES		B
BCAST_SYSTEM_INFORMATION_OUT	7206	MS_SYSTEM_INFO_DATA	103	B
BCAST_SECURITY_MSTR_CHG	7305	MS_SECURITY_UPDATE_INFO	296	B
BCAST_PART_MSTR_CHG	7306	PARTICIPANT_UPDATE_I	82	B

Transaction Code	Code	Structure	Size	I/B *
		NFO		
BCAST_INSTR_MSTR_CHG	7324	MS_INSTRUMENT_UPDATE_INFO	76	I/B
BCAST_MBO_MBP_UPDATE	7200	MS_BCAST_MBO_MBP	388	B
RPRT_SPD_MARKET_STATS_OUT_RPT	1862	MS_RP_HDR RP_SPD_MKT_STATS SPD_RP_TRAILER	42 276 44	B
BCAST_TURNOVER_EXCEEDED	9010	MS_BROADCAST_LIMIT_EXCEEDED	95	B
BROADCAST_BROKER_REACTIVATED	9011	MS_BROADCAST_LIMIT_EXCEEDED	95	B
BCAST_SPD_MSTR_CHG	7309	MS_SPD_UPDATE_INFO	130	B
BCAST_SPD_MBP_DELTA	7211	MS_SPD_MKT_INFO	202	B

** I/B - Interactive/Broadcast*

4.28 Market Type

The market types are

Market Status Id	Status
1	Normal Market
2	Odd Lot Market (Not used)
3	Spot Market (Not used)
4	Auction Market (Not used)

4.29 Market Status

The market can be one of these following status.

Market Status Id	Status
0	PreOpen (only for Normal Market)
1	Open

2	Closed
3	PreOpenEnded
4	Postclose (Not used)

4.30 Book Types

There are seven books. These books fall in four markets.

Book ID	Book Type	Market Type
1	Regular lot order	Normal Market
2	Special terms order	Normal Market
3	Stop loss / MIT order	Normal Market
4	Negotiated order (Not used)	Normal Market
5	Odd lot order (Not used)	Odd Lot Market
6	Spot order (Not used)	Spot Market
7	Auction order (Not used)	Auction Market

4.31 Security Status

Status ID	Status
1	Preopen
2	Open
3	Suspended
4	Preopen Extended
5	Open With Market

5 Appendix B

PIPE DELIMITED FILE STRUCTURES

The upload files have a header record at the beginning of the file followed by the detail records. All the fields in both the header and detail records are separated by pipe ('|').The fields are not of fixed width. Any two fields are separated by a '|' symbol.

Header

```
CHAR        NEATFO [6]
CHAR        Reserved [1]
CHAR        VersionNumber [5]
CHAR        Reserved [1]
```

Stock Structure

```
LONG        Token
CHAR        Reserved [1]
LONG        AssetToken
CHAR        Reserved [1]
CHAR        InstrumentName [6]
CHAR        Reserved [1]
CHAR        Symbol   [10]
CHAR        Reserved [1]
CHAR        Series     [2]
CHAR        Reserved   [2]
LONG        ExpiryDate (in seconds from January 1, 1980)
CHAR        Reserved [1]
LONG        StrikePrice
CHAR        Reserved [1]
CHAR        OptionType [2]
CHAR        Reserved [1]
CHAR        Category [1]
CHAR        Reserved [1]
SHORT       CALevel
CHAR        Reserved [1]
CHAR        ReservedIdentifier[1]
CHAR        Reserved [1]
SHORT       PermittedToTrade
CHAR        Reserved [1]
SHORT       IssueRate
CHAR        Reserved [1]
ST_SEC_ELIGIBILITY_ PER_ MARKET [4]
        {
            SHORT       Security Status
```

```
            CHAR        Reserved [1]
            CHAR        Eligibility
            CHAR        Reserved [2]

        }
LONG        IssueStartDate
CHAR        Reserved [1]
LONG        InterestPaymentDate
CHAR        Reserved [1]
LONG        Issue Maturity Date
CHAR        Reserved [1]
LONG        MarginPercentage
CHAR        Reserved [1]
LONG        MinimumLotQuantity
CHAR        Reserved [1]
LONG        BoardLotQuantity
CHAR        Reserved [1]
LONG        TickSize
CHAR        Reserved [1]
DOUBLE      IssuedCapital
CHAR        Reserved [1]
LONG        FreezeQuantity
CHAR        Reserved [1]
LONG        WarningQuantity
CHAR        Reserved [1]
LONG        ListingDate
CHAR        Reserved [1]
LONG        ExpulsionDate
CHAR        Reserved [1]
LONG        ReadmissionDate
CHAR        Reserved [1]
LONG        RecordDate
CHAR        Reserved [1]
LONG        NoDeliveryStartDate
CHAR        Reserved [1]
LONG        NoDeliveryEndDate
CHAR        Reserved [1]
LONG        LowPriceRange
CHAR        Reserved [1]
LONG        HighPriceRange
CHAR        Reserved [1]
LONG        ExDate
CHAR        Reserved [1]
LONG        BookClosureStartDate
CHAR        Reserved [1]
LONG        BookClosureEndDate
CHAR        Reserved [1]
LONG        LocalLDBUpdateDateTime
CHAR        Reserved [1]
```

LONG	ExerciseStartDate
CHAR	Reserved [1]
LONG	ExerciseEndDate
CHAR	Reserved [1]
SHORT	TickerSelection
CHAR	Reserved [1]
LONG	OldTokenNumber
CHAR	Reserved [1]
CHAR	CreditRating [12]
CHAR	Reserved [1]
CHAR	Name [25]
CHAR	Reserved [1]
CHAR	EGMAGM
CHAR	Reserved [1]
CHAR	InterestDivident
CHAR	Reserved [1]
CHAR	RightsBonus
CHAR	Reserved [1]
CHAR	MFAON
CHAR	Reserved [1]
CHAR	Remarks [24]
CHAR	Reserved [1]
CHAR	ExStyle
CHAR	Reserved [1]
CHAR	ExAllowed
CHAR	Reserved [1]
CHAR	ExRejectionAllowed
CHAR	Reserved [1]
CHAR	PlAllowed
CHAR	Reserved [1]
CHAR	CheckSum
CHAR	Reserved [1]
CHAR	IsCOrporateAdjusted
CHAR	Reserved [1]
CHAR	SymbolForAsset [10]
CHAR	Reserved [1]
CHAR	InstrumentOfAsset [6]
CHAR	Reserved [1]
LONG	BasePrice
CHAR	Reserved [1]
CHAR	DeleteFlag

Field Name	Descriptions	Comments
Token	Token number of the security being updated. This is unique for a particular symbol-series combination.	

Field Name	Descriptions	Comments
Asset Token	Token Number of the asset.	
Security Information	This contains the Instrument Name, Symbol & Series (EQ / IL / TT), Expiry date, Strike Price, Option Type, Corporate Action level of the security	
PermittedToTrade	• '0' - Listed but not permitted to trade • '1' - Permitted to trade	
Reserved Identifier	'0' – Unreserved Contract '1' – Reserved Contract	
IssueRate	Price of the issue.	
Eligibility	The flag is set to 1 if the security is allowed to trade in a particular market.	
SecurityStatus	• '1' - Preopen (Only for Normal market) • '2' - Open • '3' - Suspended • '4' - Preopen extended • '5' - Stock Open With Market	
IssueStartDate	Date of issue of the security.	
InterestPaymentDate	Interest Payment Date	
IssueMaturityDate	Maturity Date.	
MarginPercent	It is Initial margin percent to be collected on a contract.	
MinimumLotQuantity	It is minimum lot of the order which can be placed.	
BoardLotQuantity	Regular lot size.	
TickSize	Tick size/ Min spread size.	
IssuedCapital	Issue size of the security.	
FreezeQuantity	Freeze quantity.	
WarningQuantity	Warning quantity.	
ListingDate	Date of listing.	
ExpulsionDate	Date of expulsion.	
ReAdmissionDate	Date of readmission.	

Field Name	Descriptions	Comments
RecordDate	Date of record changed.	
NoDeliveryStartDate	Date from when physical delivery of share certificates is stopped for book closure.	
NoDeliveryEndDate	No delivery end date.	
NoDeliveryEndDate	Minimum price at which order can be placed without causing a price freeze.	
HighPriceRange	Minimum price at which order can be placed without causing a price freeze.	
ExDate	Last date of trading before any corporate action.	
BookClosureStartDate	Date at which the record books in the company for shareholder names starts.	
BookClosureEndDate	Date at which the record books in the company for shareholder names ends.	
LocalLDBUpdateDateTime	This is the local database update date-time.	
ExerciseStartDate	This is the starting date for Exercise.	
ExerciseEndDate	This is the last date for Exercise.	
OldTokenNumber	Not used.	
CreditRating	Credit rating of the security.	
Name	Security name.	
EGM/AGM	• '0' - No EGM/AGM • '1' - EGM • '2' - AGM • '3' - Both EGM and AGM	
InterestDividend	• '0' - No Interest/ Dividend • '1' - Interest • '2' - Dividend	
RightsBonus	• '0' - No Rights/Bonus • '1' - Rights • '2' - Bonus • '3' - Both Rights	

Field Name	Descriptions	Comments
	and Bonus	
MFAON	• '0' - MF/AON not allowed • '1' - MF allowed • '2' - AON allowed • '3' - MF and AON allowed	
Remark	Remarks	
ExStyle	• 'A' - American style Exercise allowed • 'E' - European style Exercise allowed	
ExAllowed	Exercise is allowed on this contract if this Flag is set to true.	
ExRejectionAllowed	Exercise rejection is allowed on this contract if this bit is set to true.	
PlAllowed	Position liquidation is allowed on this contract if this flag is set to true.	
CheckSum	Not used.	
IsCorporateAdusted	This field shows whether this Contract is Corporate Adjusted.	
AssetName	Name of the underlying asset.	For example, NIFTY.
InstrumentIDOfAsset	ID of the Instrument for the underlying asset of this contract.	
AssetInstrument	Underlying asset type.	For example, INDEX.
BasePrice	Base price of the security.	
DeleteFlag	This indicates the status of the security, whether the security is deleted or not. • 'N' : Active • 'Y' : Deleted	

5.1 Participant File Structure

Header

CHAR NEATFO [6]
Reserved 1 byte
CHAR VersionNumber [5]
Reserved 1 byte

Structure

CHAR ParticipantId [12]
Reserved 1 byte
CHAR ParticipantName [25]
Reserved 1 byte
CHAR ParticipantStatus
Reserved 1 byte
CHAR DeleteFlag
Reserved 1 byte
LONG LastUpdateTime

Field Name	Descriptions	Comments
ParticipantId	ID of the Participant	
ParticipantName	Name of the participant	
ParticipantStatus	If this field is 'S' then the Participant is Suspended. If this is 'A' then the Participant is Active.	
DeleteFlag	If this field is 'Y' then the participant is deleted from the system, else he is present in the system.	
LastUpdateTime	The last time this record was modified.	

5.2 Security File Structure

Header

CHAR NEATCM [6]
Reserved 1 byte

```
CHAR            VersionNumber [7]
Reserved 1 byte
LONG            CreationTime
```

Security Structure

```
SHORT           Token
Reserved 1 byte
CHAR            Symbol   [10]
Reserved 1 byte
CHAR            Series    [2]
Reserved 1 byte
SHORT           InstrumentType
Reserved 1 byte
DOUBLE          IssuedCapital
Reserved  1 byte
SHORT           PermittedToTrade
Reserved 1 byte
CHAR            CreditRating [17]
Reserved  1 byte
ST_SEC_ELIGIBILITY_ PER_ MARKET [4]
        {
            SHORT           Security Status
            Reserved 1 byte
            CHAR            Eligibility
            Reserved 1 byte
        }
LONG            BoardLotQty
Reserved 1 byte
LONG            TickSize
Reserved 1 byte
CHAR            Name [25]
Reserved  1 byte
SHORT           IssueRate
Reserved  1 byte
LONG            IssueStartDate
Reserved  1 byte
LONG            IssueIPDate
Reserved  1 byte
LONG            Issue Maturity Date
Reserved  1 byte
SHORT           FreezePercent
Reserved  1 byte
LONG            ListingDate
Reserved  1 byte
LONG            ExpulsionDate
Reserved  1 byte
LONG            ReAdmissionDate
```

Reserved 1 byte
LONG ExDate
Reserved 1 byte
LONG RecordDate
Reserved 1 byte
LONG NoDeliveryStartDate
Reserved 1 byte
LONG NoDeliveryEndDate
Reserved 1 byte
CHAR ParticipateInIndex
Reserved 1 byte
CHAR AON
Reserved 1 byte
CHAR MinFill
Reserved 1 byte
SHORT WarningPercent
Reserved 1 byte
LONG BookClosureStartDate
Reserved 1 byte
LONG BookClosureEndDate
Reserved 1 byte
CHAR Dividend
Reserved 1 byte
CHAR Rights
Reserved 1 byte
CHAR Bonus
Reserved 1 byte
CHAR Interest
Reserved 1 byte
CHAR AGM
Reserved 1 byte
CHAR EGM
Reserved 1 byte
CHAR Remark [25]
Reserved 1 byte
LONG LocalDBUpdateDateTime
Reserved 1 byte
CHAR DeleteFlag
Reserved 1 byte
LONG FaceValue
Reserved 1 byte
CHAR ISIN [12]

Field Name	Descriptions	Comments
Token	Token number of the security being updated. This is unique for a particular symbol-series combination.	
SecurityInformation	This contains the Symbol , Series (EQ / IL / TT) & Instrument type	
IssuedCapital	Issue size of the security.	
PermittedToTrade	• '0' - Listed but not permitted to trade • '1' - Permitted to trade	
CreditRating	Credit rating of the security.	
SecurityStatus	• '1' - Preopen (Only for Normal market) • '2' - Open • '3' - Suspended • '4' - Preopen extended • '5' - Stock Open With Market	
Eligibility	The flag is set to 1 if the security is allowed to trade in a particular market.	
BoardLotQuantity	Regular lot size.	
TickSize	Tick size/ Min spread size.	
Name	Security name.	
IssueRate	Price of the issue.	
IssueStartDate	Date of issue of the security.	
InterestPaymentDate	Interest Payment Date	
IssueMaturityDate	Maturity Date.	
FreezePercent	Freeze Percent for the security.	
ListingDate	Date of listing.	
ExpulsionDate	Date of expulsion.	
ReAdmissionDate	Date of readmission.	
ExDate	Last date of trading before any corporate action.	

Field Name	**Descriptions**	**Comments**
RecordDate	Date of record changed.	
NoDeliveryStartDate	Date from when physical delivery of share certificates is stopped for book closure.	
NoDeliveryEndDate	No delivery end date.	
ParticipateInIndex	• '0' - Not Participate In Index • '1' - Participate In Index	
AON	• '0' - AON not allowed • '1' - AON allowed	
MF	• '0' - MF not allowed • '1' - MF allowed	
Warning Percent	Warning Percent	
BookClosureStartDate	Date at which the record books in the company for shareholder names starts.	
BookClosureEndDate	Date at which the record books in the company for shareholder names ends.	
Dividend	• '0' - No Dividend • '1' - Dividend	
Rights	• '0' - No Rights • '1' - Rights	
Bonus	• '0' - No Bonus • '1' - Bonus	
Interest	• '0' - No Interest • '1' - Interest	
EGM	• '0' - No EGM • '1' - EGM	
AGM	• '0' - No AGM • '1' - AGM	
Remark	Remarks	
LocalLDBUpdateDateTime	This is the local database update date-time.	
DeleteFlag	This indicates the status of the security, whether the security is deleted or not. • 'N' : Active	

Field Name	Descriptions	Comments
	• 'Y' : Deleted	
Face value	Face value of security	Already present in security.txt but was not used. To correctly use the ISIN field face value should be considered.
ISIN	ISIN number of security	