MARKET FEED
Capital Market (CM)
(LEVEL – 1, LEVEL – 2, LEVEL – 3)

Version: 1.34

Date: 22 September 2026

NSE DATA & ANALYTICS LIMITED
EXCHANGE PLAZA,
PLOT NO. C/1, G BLOCK,
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Revision History

Name	Description	Date
Version 1.0	New Specification Issued	16 October 2012
Version 1.1	Correction in ST_COMP_BATCH_HEADER Point no 3	30 November 2012
Version 1.2	S&P is removed from the indices name Point no 10	12 February 2013
Version 1.3	New Index addition	11 March 2014
Version 1.4	New Index addition	28 May 2014
Version 1.5	Addition of 4 New Indices	30 September 2014
Version 1.6	New Index addition	12 June 2015
Version 1.7	Index Name Rebranding	29 September 2015
Version 1.8	10 New Indices Addition and Indices Rename Change	08 March 2016
Version 1.9	Correction in Broadcast Message	09 January 2018
Version 1.10	Addition of 4 New Indices	31 January 2018
Version 1.11	Index Rename Change	19 March 2018
Version 1.12	Change in regular/market lot field size from CHAR [5] to CHAR [6] in 2 structures 5.7 EOD – Master Addition/ Modification/ Deletion and 5.10 EOD Corporate Action Update	11 May 2018
Version 1.13	Index Rename Change	03 July 2018
Version 1.14	Addition of 5 New Indices	04 January 2019
Version 1.15	Index Segregation	30 January 2020
Version 1.16	Addition of 2 New Indices	06 August 2020
Version 1.17	Addition of 2 New Indices	30 September 2020
Version 1.18	1. Removed FAO L3 and FAO TBT description 2. Removed section 2.2 Online Requirements 3. Addition of 5 New Indices	03 August 2021
Version 1.19	Removal of TCP/IP Session Initialization, Login Request, Login Response	29 October 2021
Version 1.20	Added Settlement Cycle field in BOD Master Information	21 December 2021
Version 1.21	Addition of 7 new indices	08 January 2022
Version 1.22	1. Removal of section 4.3 Online Indices Information (CX). 2. Removal of section 4.10 EOD – Index Information (CI) and section 9 (Annexure 1).	12 March 2024

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Version 1.23	1. Addition of T+0 Settlement Mechanism 2. Merger of Level 1, Level 2 & Level 3 documents.	20 March 2024
Version 1.24	FAQ added	04 June 2024
Version 1.25	Adding 6 new fields in BOD - Master Information	14 June 2024
Version 1.26	1. Adding Lot Size Comment in BOD - Master Information and EOD – Master Addition /Modification/Deletion 2. Adding Tick Size FAQ in FAQ 3. Updated Brief Description for SSEC field in BOD - Master Information	20 August 2024
Version 1.27	Addition of Indicative Close Price Field in Online – Touchline Market Update and Online – 5 Depth Market Update	23 August 2024
Version 1.28	Update Brief Description for Lot Size field in BOD - Master Information and EOD – Master Addition /Modification/Deletion	24 September 2024
AY	1. Addition of INAV Symbol mapping to NSE Symbol 2. Addition of Indicative Close Price Field in Online – 20 Depth Market Update 3. Added 6 questions in FAQs section	28 February 2025
Version 1.30	1. Removal of ca1 2. Addition of 2 questions in FAQs section 3. Added Permitted to Trade field in BOD - Master Information 4. Addition of TL in Regular Lot Description for BOD - Master Information	03 April 2025
Version 1.31	Modification in SSEC field identifier in BOD - Master Information	13 June 2025
Version 1.32	1. Introduction of Closing Auction Session (CAS) in following messages • 3.1 BOD Master Information • 3.3 Online - Market Status Message • 3.4 Online – Touchline Market Update • 3.5 Online – 5 Depth Market Update • 3.6 Online – 20 Depth Market update • 3.9 Online – CAS Reference Price Update 2. Addition of section 6.6 - Closing Auction Session (CAS) 3. Addition of Closing Auction Session (CAS), CTS and VWAP in section 7 - Acronyms Used 4. Added 2 questions in FAQs section	03 August 2026
Version 1.33	1. Pre-open session alignment with CAS in following messages • 3.3 Online - Market Status Message • 3.4 Online – Touchline Market Update	07 September 2026

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	• 3.5 Online – 5 Depth Market Update 2. Added question in FAQ section 3. Updated section 6.3 Preopen Session	
Version 1.34	Addition of 'CV' packet during pre-open session	22 September 2026

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Market Feed – Capital Market (Level 1, Level 2 & Level 3)

1 Introduction

NSE Data & Analytics Ltd. offers real-time data and historical data products from NSEIL to a diverse range of clients. This includes real-time products and historical data products:

Real Time data products
1. Real Time Data
2. Snapshot Data
3. Corporate Data
4. Analytical Products data
5. Indicative NAV Data

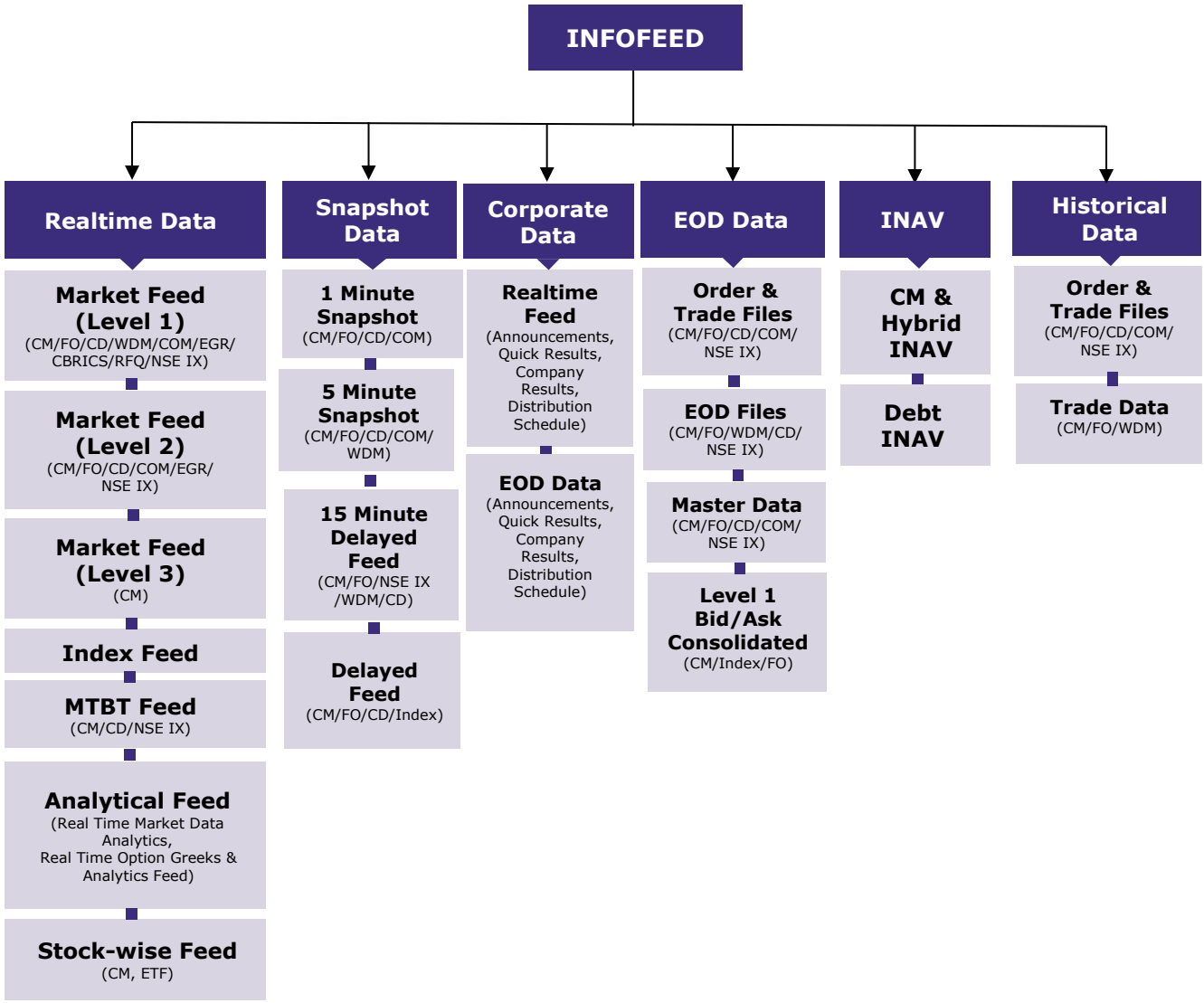
Historical data products
1. End of Day Data
2. Historical Data

The data products are provided through delivery modes mentioned below:

- **Real-time and Snapshot Data**: The information is transmitted as a packet broadcast, facilitating ongoing distribution through data feeds via point-to-point leased line and the snapshot data through SFTP protocol.

- **End-of-Day and Historical Data**: The data is delivered as downloadable files over the internet using the SFTP protocol and through cloud.

All these data categories are integrated within the Infofeed platform, ensuring comprehensive coverage and streamlined access.



NSE Data & Analytics Limited (NDAL) offers a comprehensive portfolio of real-time and historical market data products sourced from NSEIL, covering the Capital Market (CM), Futures & Options (FO), Currency Derivatives (CD), Commodity Derivatives (COM), Electronic Gold Receipt (EGR), and NSE IX segments. These products provide market information ranging from low-latency intraday data streams to structured end-of-day datasets, catering to a broad spectrum of clients and using cases.

This document explains the NSE – Market Feed (CM Level 1, Level 2 & Level 3) products. Through this product on a real-time basis all the NSE's market update information is disseminated.

The information agencies connect to the Market Feed Server through Leased Lines. These leased lines are terminated on Infofeed Router, and their data specific pneumonic calls are forwarded to Infofeed server.

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2 Packet Format

Server sends all the packets in the following format.

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

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

typedef struct
{
        .
        .
}ST_DATA_INFO;

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

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

The feed consists of a series of sequenced and unsequenced variable length compressed messages. All the packets received from the server consist of a compress batch header. The compress batch header provides metadata about the associated data packet, including:

- Whether the packet is compressed.
- The number of individual packets contained within.
- The total size of the data packet.

To process the data, the client must apply the LZO decompression algorithm to decompress the packet and retrieve its contents.

After decompression each data packet consists of ST_INFO_HEADER, which has the iCode field to identify the type of the packet. Using iCode field, data info packets are mapped to the respective data packets.

2.1 Data Types

Data types used in feed:

Data Type	Size In Bytes
CHAR	1
SHORT	2
LONG	4

- Byte order - Big Endian
- All structures are pragma pack 1.
- All timestamps are expressed in Indian Standard Time (IST). Where a timestamp is represented as seconds since the Epoch, the reference shall be 01-01-1970 00:00:00 IST.

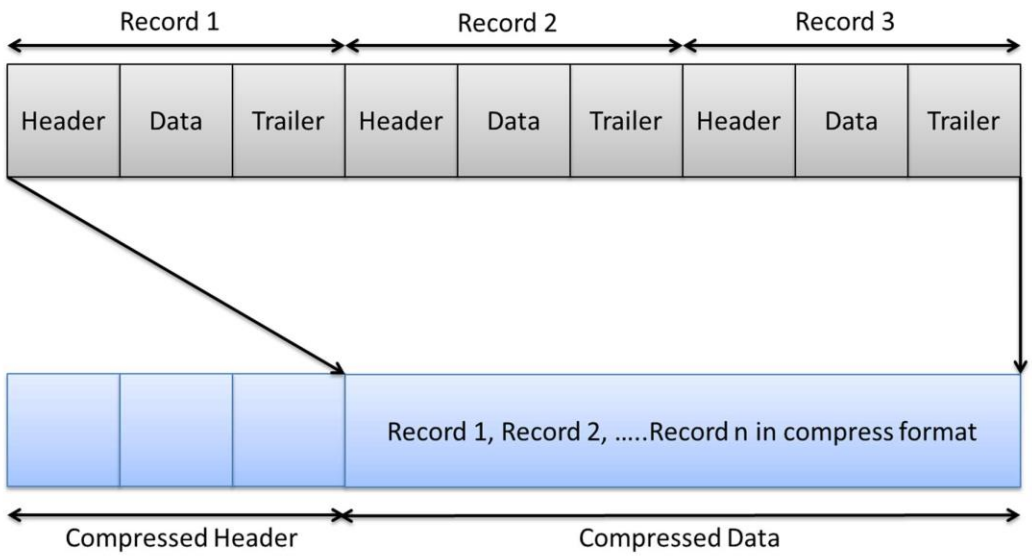
2.2 Twiddling Mechanism

Twiddling refers to the reversal of byte order in a multibyte data element, such that the byte at position *n* is moved to position *1*, the byte at position *(n−1)* is moved to position *2*, and so on.

This operation is required to address differences in endian representation across systems. In big-endian format, the most significant byte (MSB) is stored at the lowest memory address (leftmost position), whereas in little-endian format, the MSB is stored at the highest memory address (rightmost position). For instance, Intel x86 architectures follow little-endian representation, while architectures such as SPARC, Motorola 68K, and PowerPC follow big-endian representation.

All protocol layers use big-endian (network byte order). Since the trading system host operates in big-endian format, any numeric values originating from or being processed on little-endian systems shall be twiddled prior to transmission and after reception to ensure correct interpretation.

2.3 Diagrammatic Representation of Packet Format



Compressed Header

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

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

Steps to decompress a packet and extract data from it

- Receive a packet from the feed and check ST_COMP_BATCH_HEADER's cCompOrNot to see if the data is compressed or not.
- If the cCompOrNot flag is '0' then the data is compressed so use LZO Decompress to extract the data. The position of data would be the difference in position between the received bytes and the ST_COMP_BATCH_HEADER size.
- If the cCompOrNot flag is '1' then the data is not compressed so just copy the bytes after the header to get the data.
- Type cast the data above data to ST_INFO_HEADER and get iCode from it. iCode can be used to identify the type of packet.
- Based on iCode, map the data section into the required structure.
- After the data section, map the trailer ST_INFO_TRAILER to get the iCheckSum i.e. checksum (Refer to section checksum calculation)

3 Sequenced Data Message

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

3.1 BOD & Online - Master Information

These packets are sent both before market opening and throughout the trading day. This feed contains the information about the securities valid in the CM Market for trading.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CT'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Token Number	CHAR [10]	Character	Token number of the security. This is unique for a particular symbol-series combination.
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
ISIN	CHAR [12]	Character	An International Securities Identification Number (ISIN) uniquely identifies a security
Is Deleted	CHAR [1]	Character	'Y' = Deleted 'N' = Not Deleted
Low Price Range	CHAR [10]	Character	Any order placed at a price lower than this value goes into a freeze and requires exchange action before the order gets confirmed. For CAS eligible security, it will be updated with low price of CAS securities (-3 % of reference price)
High Price range	CHAR [10]	Character	Any order placed at a price higher than this value goes into a freeze and requires exchange action before the order gets confirmed. For CAS eligible security, it will be updated with high price of CAS securities (+3 % of reference price)

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Security Eligibility Per Market	ST_SECURITY_ELIGIBILITY_PER_MARKET [6]	Structure	Refer to table given below ST_SECURITY_ELIGIBILITY_PER_MARKET and FAQ
Settlement cycle	SHORT	Numeric	Value can be 0 or 1 0 = T+0 will be the settlement Period for that security 1 = T+1 will be the settlement Period for that security
Security Description	CHAR [30]	Character	Security Name
Regular Lot	CHAR [6]	Character	Lot Size. (The Lot size can be 999999 for the security with 'BL', 'DL' and 'TL' series)
Tick Size	CHAR [6]	Character	Tick size of the security.
Face Value	CHAR [9]	Character	Security face value
Issue Capital	CHAR [12]	Character	Issue size of the security
SSEC	SHORT	Numeric	This is used as an identifier for different market securities. 0 - Not used. 1 - Securities (except SME) eligible in Normal market and Odd Lot markets 2 – IPO Session is being held security (including SME). 3 – Re-list Session is being held security (including SME). 4 - Illiquid security eligible for Call Auction session (CA2) (including SME). 5 - SME securities eligible in normal market.
Permitted To Trade	CHAR [1]	Character	'0' - Listed '1' - Permitted to trade '2' - BSE listed (Refer to FAQ 14 for more details.)
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

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ST_SECURITY_ELIGIBILITY_PER_MARKET

Field Name	Data Type	Value	Brief Description
ST_SECURITY_ELIGIBILITY_PER_MARKET			
Market Type	CHAR [1]	Character	'N' = Normal 'O' = Odd Lot 'S' = Closing Auction 'A' = Auction 'C' = Call Auction 'G' = Call Auction 2
Eligibility	CHAR [1]	Character	'1' = Allowed to trade '0' = Not allowed to trade
Security Status	CHAR [1]	Character	'1' = Open '0' = Suspended

3.2 BOD - INAV Symbol mapping to NSE Symbol

These packets provide a mapping of security symbol to Indicative NAV (INAV) symbol. It contains data that links the symbol of security to its corresponding INAV symbol. These packets are sent at the beginning of each trading day before the market opens.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CQ'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	0 (Zero) for heartbeat message
INFO DATA			
Token Number	CHAR [10]	Character	Token for NSE symbol is unique identifier for the securities listed on NSE.
Symbol	CHAR [10]	Character	Exchange-assigned security code
INAV Symbol	CHAR [10]	Character	Mapped INAV Symbol with Security symbol
INFO TRAILER			
Checksum	SHORT	Numeric	Checksum is not calculated, so it is sent as 0 (Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.3 Online - Market Status Message

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

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'PO' 'PR' 'PC' 'CO' 'CC' 'CK' 'CL' 'TC' 'RC' 'AO' 'MR' 'AC'	'PO' = Preopen / Call Auction session start 'PR' = Market order restriction starts in preopen session 'PC' = Preopen / Call Auction session end 'CO' = Market Open for Market Type field 'CC' = Market Close for Market Type field 'CK' = Post close session start 'CL' = Post close session end 'TC' = Normal market closed for securities in CAS 'RC' = Price band of securities revised for CAS 'AO' = Closing auction session start 'MR' = Market order restriction starts in CAS 'AC' = Closing auction session end
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Market Type	CHAR [1]	Character	'N' = Normal 'O' = Odd Lot 'S' = Spot 'A' = Auction 'G' = Call Auction 2
INFO TRAILER			
Checksum	SHORT	Numeric	Checksum is not calculated, so it is sent as 0(Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

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3.4 Online – Touchline Market Update

NSE securities update information for preopen and normal markets is sent through this Message.
This market update is available only in level 1 feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'PN' 'CN' 'AN'	'PN' = Preopen session updates 'CN' = Normal market updates 'AN' = Closing Auction Session updates
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence Number
INFO DATA			
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Market Type	CHAR [1]	Character	'N' = Normal 'O' = Odd Lot 'S' = Spot 'A' = Auction
Timestamp	CHAR [11]	Character	Time expressed as seconds since 01-01-1970 00:00:00 IST.
Best Buy-Order price	CHAR [10]	Character	Best buy side's outstanding order price
Best Buy-Order Quantity	CHAR [12]	Character	Best buy side's outstanding order quantity
Best Sell-Order price	CHAR [10]	Character	Best sell side's outstanding order price
Best Sell-Order quantity	CHAR [12]	Character	Best sell side's outstanding order quantity
Last Traded Price (LTP)	CHAR [10]	Character	This represents the last traded price for security. In the absence of any trade during the day, the system will default to the previous day's last traded price; if unavailable, the base price is applied.
Total Traded Quantity (TTQ)	CHAR [12]	Character	This field contains the total quantity of security traded on the current day. For CAS-eligible securities, this field

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			shall represent the Indicative Tradable Quantity.
Security Status	CHAR [1]	Character	'S' = Suspended ' ' = Non-suspended
Opening Price	CHAR [10]	Character	Open price of the security for the day. In the preopen session the indicative open price is sent if security is available in the preopen session.
High Price	CHAR [10]	Character	High price of security for the day
Low Price	CHAR [10]	Character	Low price of security for the day
Close Price	CHAR [10]	Character	Close price of the security. During the day previous day's close price is sent. After market closes, current day's close price is calculated. For CAS eligible security, refer to Indicative Close Price
Average Trade Price	CHAR [10]	Character	Weighted average price of the security i.e. value / quantity
Total Turnover	CHAR [25]	Character	Security traded value i.e. Average Trade Price * TTQ
Online Index	CHAR [8]	Character	NIFTY 50 index value
Indicative Close Price	CHAR [10]	Character	For non-CAS securities, this field shall contain the Indicative Close Price during the last 30 minutes of the normal trading session (03:00 PM to 03:30 PM). Prior to this period, the value of this field shall be 0. For CAS-eligible securities: • This field shall contain 0 from 03:00 PM to 03:15 PM. • During the Call Auction Session, this field shall contain the Indicative Equilibrium Price (IEP). • If the IEP is not determined, the Reference Price shall be disseminated. • After the conclusion of the Closing Auction Session, this field shall contain the Final Closing Price of the security.

Indicative Imbalance Quantity	CHAR [12]	Character	Normal Market: For security eligible in normal market, this field is sent as zero. This field is applicable during preopen session. This field is applicable during Closing Auction Session for CAS eligible securities only. This field is the absolute difference between Cumulative buy quantity and Cumulative sell quantity. In addition to the aforesaid absolute difference, positive/negative value shall show the side (Buy/sell) having greater order quantity.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.5 Online – 5 Depth Market Update

NSE securities update information for preopen and normal markets is sent through this Message.
This 5 Depth market update is available in level 2 and level 3 feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'PN' 'CN' 'AN'	'PN' = Preopen session updates 'CN' = Normal market updates 'AN' = Closing Auction Session updates
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Market Type	CHAR [1]	Character	'N' = Normal 'O' = Odd Lot 'S' = Spot 'A' = Auction
Timestamp	CHAR [11]	Character	Time expressed as seconds since 01-01-1970 00:00:00 IST.
5 Depth Buy Order details	MARKET_DEPTH_BUY_ORDER_INFO [5]	Structure	Refer to the table given below MARKET_DEPTH_BUY_ORDER_INFO
5 Depth Sell Order details	MARKET_DEPTH_SELL_ORDER_INFO [5]	Structure	Refer to the table given below MARKET_DEPTH_SELL_ORDER_INFO
Last Traded Price (LTP)	CHAR [10]	Character	This represents the last traded price for security. In the absence of any trade during the day, the system will default to the previous day's last traded price; if unavailable, the base price is applied.
Last Traded Quantity (LTQ)	CHAR [12]	Character	Quantity of the last trade in the security. If no trade occurs on the trading day, the previous day's LTQ or zero is sent.
Total Traded Quantity (TTQ)	CHAR [12]	Character	This field contains the total quantity of security traded on the current day. For CAS-eligible securities, this field shall represent the Indicative Tradable Quantity.

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Security Status	CHAR [1]	Character	'S' = Suspended ' ' = Non-suspended
Opening Price	CHAR [10]	Character	Open price of the security for the day. In the pre-open session the indicative open price is sent if security is available in the pre- open session.
High Price	CHAR [10]	Character	High price of security for the day
Low Price	CHAR [10]	Character	Low price of security for the day
Close Price	CHAR [10]	Character	Close price of the security. During the day previous day's close price is sent. After market closes, current day's close price is calculated. For CAS eligible security, refer to Indicative Close Price
Average Trade Price	CHAR [10]	Character	Weighted average price of the security i.e. value / quantity
Total Buy Quantity	CHAR [12]	Character	Total number of outstanding orders available on buy side.
Total Sell Quantity	CHAR [12]	Character	Total number of outstanding orders available on sell side.
Total Turnover	CHAR [25]	Character	Security traded value i.e. Average Trade Price * TTQ
Online Index	CHAR [8]	Character	NIFTY 50 index value
Indicative Close Price	CHAR [10]	Character	For non-CAS securities, this field shall contain the Indicative Close Price during the last 30 minutes of the normal trading session (03:00 PM to 03:30 PM). Prior to this period, the value of this field shall be 0. For CAS-eligible securities: • This field shall contain 0 from 03:00 PM to 03:15 PM. • During the Call Auction Session, this field shall contain the Indicative Equilibrium Price (IEP). • If the IEP is not determined, the Reference Price shall be disseminated. • After the conclusion of the Closing Auction Session, this field shall contain the Final Closing Price of the security.

Indicative Imbalance Quantity	CHAR [12]	Character	Normal Market: For security eligible in normal market, this field is sent as zero. This field is applicable during preopen session. This field is applicable during Closing Auction Session for CAS eligible securities only. This field is the absolute difference between Cumulative buy quantity and Cumulative sell quantity. In addition to the aforesaid absolute difference, positive/negative value shall show the side (Buy/sell) having greater order quantity.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.6 Online – 20 Depth Market update

These packets contain the latest order and trade information of securities up to the order book depth of 20. These packets are sent during the Preopen session and normal market hours.

The Online Index field in this packet indicates the value of the Nifty 50 when the trade occurs.

This 20 Depth Market Update is available only in level 3 feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CV'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Market Type	CHAR [1]	Character	'N' = Normal 'O' = Odd Lot 'S' = Spot 'A' = Auction
Timestamp	CHAR [11]	Character	Time expressed as seconds since 01-01-1970 00:00:00 IST.
20 Depth Buy order details	MARKET_DEPTH_BUY_ORDER_INFO [20]	Structure	Refer to the table given below MARKET_DEPTH_BUY_ORDER_INFO
20 Depth Sell order details	MARKET_DEPTH_SELL_ORDER_INFO [20]	Structure	Refer to the table given below MARKET_DEPTH_SELL_ORDER_INFO
Last Traded Price (LTP)	CHAR [10]	Character	This represents the last traded price for security. In the absence of any trade during the day, the system will default to the previous day's last traded price; if unavailable, the base price is applied.
Last Traded Quantity (LTQ)	CHAR [12]	Character	Quantity of the last trade in the security. If no trade occurs on the trading day, the previous day's LTQ or zero is sent.
Total Traded Quantity (TTQ)	CHAR [12]	Character	This field contains the total quantity of security traded on the current day. For CAS-eligible securities, this field shall represent the Indicative Tradable Quantity.

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Security Status	CHAR [1]	Character	'S' = Suspended ' ' = Non-suspended
Opening Price	CHAR [10]	Character	Open price of the security for the day. In preopen session the indicative open price is sent if security is available in pre-open session
High Price	CHAR [10]	Character	High price of security for the day
Low Price	CHAR [10]	Character	Low price of the security for the day
Close Price	CHAR [10]	Character	Close price of the security. During the day previous day's close price is sent. After market closes, current day's close price is calculated. For CAS eligible security, refer to Indicative Close Price
Average Trade Price	CHAR [10]	Character	Weighted the average price of the security i.e. value / quantity
Total Buy Quantity	CHAR [12]	Character	Total number of outstanding orders available on buy side.
Total Sell Quantity	CHAR [12]	Character	Total number of outstanding orders available on sell side.
Total Turnover	CHAR [25]	Character	Security traded value i.e. Average Trade Price * TTQ
Online Index	CHAR [8]	Character	NIFTY 50 index value
Indicative Close Price	CHAR [10]	Character	For non-CAS securities, this field shall contain the Indicative Close Price during the last 30 minutes of the normal trading session (03:00 PM to 03:30 PM). Prior to this period, the value of this field shall be 0. For CAS-eligible securities: • This field shall contain 0 from 03:00 PM to 03:15 PM. • During the Call Auction Session, this field shall contain the Indicative Equilibrium Price (IEP). • If the IEP is not determined, the Reference Price shall be disseminated. • After the conclusion of the Closing Auction Session, this field shall contain the Final Closing Price of the security.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

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MARKET_DEPTH_BUY_ORDER_INFO

Field Name	Data Type	Value	Brief Description
MARKET_DEPTH_BUY_ORDER_INFO			
Best Buy-Order price	CHAR [10]	Character	Best 5 or 20 buy side's outstanding orders price and quantity information During Preopen (PN) or closing auction (AN) order collection period, in this structure the first four rows for Buy contains the four Limit orders and the last row of both sides is reserved for ATO (Market) orders. During Preopen or closing auction order collection, if ATO order exists then in Price field '0.00' will be sent in the last row of both sides. This is not applicable in 20 Depth or level 3
Best Buy-Order Quantity	CHAR [12]	Character	

MARKET_DEPTH_SELL_ORDER_INFO

Field Name	Data Type	Value	Brief Description
MARKET_DEPTH_SELL_ORDER_INFO			
Best Sell-Order price	CHAR [10]	Character	Best 5 or 20 sell side's outstanding orders price and quantity information During Preopen (PN) or closing auction (AN) order collection period, in this structure the first four rows for Sell contains the four Limit orders and the last row of both sides is reserved for ATO (Market) orders. During Preopen or closing auction order collection, if ATO order exists then in Price field '0.00' will be sent in the last row of both sides. This is not applicable in 20 Depth (level 3)
Best Sell-Order quantity	CHAR [12]	Character	

3.7 Online - Call Auction Market Security Update

3.7.1 Reserved Market (Call Auction 2)

Multiple sessions of call auction market can be held on a trading day.

The call auction session shall consist of
- Order collection period (Order entry, modification and cancellation is allowed)
- Order matching period.

The computation of Indicative Opening Price (IOP) and matching logic shall be same as preopen session for Cash Market segment. In the call auction market, after the matching period is over, all the outstanding orders shall be cancelled.

This market consists of SME (Small & Medium Enterprise), IPO & Re-listed and illiquid securities.
For a detailed explanation please refer to section Call Auction 2.

3.7.2 Call Auction 2 (Touchline Market Update)

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'SN'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence Number
INFO DATA			
Symbol	CHAR [10]	Character	Exchange-assigned security code
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Market Type	CHAR [1]	Character	'G' = Call Auction 2
Timestamp	CHAR [11]	Character	Time expressed as seconds since 01-01-1970 00:00:00 IST.
Best Buy-Order price	CHAR [10]	Character	Best buy side's outstanding order price
Best Buy-Order Quantity	CHAR [12]	Character	Best buy side's outstanding order quantity
Buy BBMM Flag	CHAR [1]	Character	Refer to section BBMM Flag
Best Sell-Order price	CHAR [10]	Character	Best sell side's outstanding order price

Best Sell-Order quantity	CHAR [12]	Character	Best sell side's outstanding order quantity
Sell BBMM Flag	CHAR [1]	Character	Refer to section BBMM Flag
Last Traded Price (LTP)	CHAR [10]	Character	This represents the last traded price for security. In the absence of any trade during the day, the system will default to the previous day's last traded price; if unavailable, the base price is applied.
Total Traded Quantity (TTQ)	CHAR [12]	Character	This field contains the total quantity of security traded on the current day.
Indicative Traded Quantity	CHAR [12]	Character	During order collection period this field will contain Indicative Equilibrium Quantity
Security Status	CHAR [1]	Character	'S' = Suspended ' ' = Non-suspended
Opening Price	CHAR [10]	Character	This field contains the indicative opening price (IOP) of security for order collection period session and Final Open Price of security in matching period
High Price	CHAR [10]	Character	During the order collection period it will always be zero. Once matching starts it will be updated
Low Price	CHAR [10]	Character	During the order collection period it will always be zero. Once matching starts it will be updated
Close Price	CHAR [10]	Character	This field contains closing price of a security.
Average Trade Price	CHAR [10]	Character	Weighted the average price of the security i.e. value / quantity. During the order collection period it will always be zero. Once matching starts it will contain the Average Trade Price

First Open Price	CHAR [10]	Character	During first call auction order collection period this field will be zero. Once matching starts it will contain the First Trade Price. Once updated for all subsequent call auctions it will not change. This field may remain zero till the first trade happens
Total Turnover	CHAR [25]	Character	During the order collection period it will always be zero. Once matching starts it will be updated
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.7.3 Call Auction 2 (5 Depth Market Update)

This 5 Depth market update is available in level 2 and level 3 feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'SN'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence Number
INFO DATA			
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Market Type	CHAR [1]	Character	'G' = Call Auction 2
Timestamp	CHAR [11]	Character	Time expressed as seconds since 01-01-1970 00:00:00 IST.
5 Depth Buy order details	MARKET_DEPTH_BUY_ORDER_INFO [5]	Structure	Refer to the table given below MARKET_DEPTH_AUCTION_BUY_ORDER_INFO [5]
5 Depth Sell order details	MARKET_DEPTH_SELL_ORDER_INFO [5]	Structure	Refer to the table given below MARKET_DEPTH_AUCTION_SELL_ORDER_INFO [5]
Buy BBMM Order Exists	CHAR [1]	Character	Refer to section BBMM Flag
Sell BBMM Order Exists	CHAR [1]	Character	Refer to section BBMM Flag
Last Traded Price (LTP)	CHAR [10]	Character	This represents the last traded price for security. In the absence of any trade during the day, the system will default to the previous day's last traded price; if unavailable, the base price is applied.

Last Traded Quantity (LTQ)	CHAR 12]	Character	Quantity of the last trade in the security. If no trade occurs on the trading day, the previous day's LTQ or zero is sent.
Total Traded Quantity (TTQ)	CHAR [12]	Character	This field contains the total quantity of security traded on the current day.
Indicative Traded Quantity	CHAR [12]	Character	During order collection period this field will contain Indicative Equilibrium Quantity
Security Status	CHAR [1]	Character	'S' = Suspended ' ' = Non-suspended
Opening Price	CHAR [10]	Character	This field contains the indicative opening price (IOP) of security for order collection period session and Final Open Price of security in matching period
High Price	CHAR [10]	Character	During the order collection period it will always be zero. Once matching starts it will be updated
Low Price	CHAR [10]	Character	During the order collection period it will always be zero. Once matching starts it will be updated
Close Price	CHAR [10]	Character	This field contains the closing price of a security
Average Trade Price	CHAR [10]	Character	Weighted average price of the security. i.e. value / quantity During the order collection period it will always be zero. Once matching starts it will contain the Average Trade Price

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First Open Price	CHAR [10]	Character	During first call auction order collection period this field will be zero Once matching starts, it will contain the First Trade Price. Once updated for all subsequent call auctions, it will not change. This field may contain zero until the first trade happens
Total Buy Quantity	CHAR [12]	Character	This field contains the total quantity of buy orders in a security
Total Sell Quantity	CHAR [12]	Character	This field contains the total quantity of sell orders in a security
Total Turnover	CHAR [25]	Character	During the order collection period it will always be zero. Once matching starts, it will be updated
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

MARKET_DEPTH_AUCTION_BUY_ORDER_INFO [5]

Field Name	Data Type	Value	Brief Description
MARKET_DEPTH_AUCTION_BUY_ORDER_INFO [5]			
Best Buy-Order price	CHAR [10]	Character	Best 5 buy side's outstanding orders price, quantity & BBMM flag information. Refer to section BBMM Flag In the case of Call auction 2, the best 5 buy side's outstanding order information is sent
Best Buy-Order Quantity	CHAR [12]	Character	
Buy BBMM Flag	CHAR [1]	Character	

MARKET_DEPTH_AUCTION_SELL_ORDER_INFO [5]

Field Name	Data Type	Value	Brief Description
MARKET_DEPTH_AUCTION_SELL_ORDER_INFO [5]			
Best Sell-Order price	CHAR [10]	Character	Best 5 sell side's outstanding orders price, quantity & BBMM flag information. Refer to section BBMM Flag In the case of Call auction 2, the best 5 sell side's outstanding orders information is sent
Best Sell-Order Quantity	CHAR [12]	Character	
Sell BBMM Flag	CHAR [1]	Character	

3.8 Online - Broadcast Message

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

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

3.9 Online – CAS Reference Price Update

These packets consist of messages sent for CAS-enabled securities at the conclusion of the continuous trading session (CTS) and prior to the commencement of the CAS session for those securities.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CR'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Token Number	CHAR [10]	Character	Token number of the security. This is unique for a particular symbol-series combination.
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Reference Price	CHAR [10]	Character	The reference price of stock in CAS shall be determined based on the VWAP of the trades executed in the stock from 3:00 p.m. to 3:15 p.m. If no trade is executed in stock from 3:00 p.m. to 3:15 p.m., LTP of the stock during the day shall be taken as the reference price for CAS. In case there is no trade during the day, the closing price of the stock of the previous trading day shall be taken as the reference price for CAS. In case of corporate action, previous day's closing price shall be the adjustable closing price or the base price.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

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3.10 EOD – Market Statistics (Bhavcopy)

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

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CS'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Market Type	CHAR [1]	Character	'N'=Normal 'O'=Odd Lot 'S'= Spot 'A'=Auction 'G'=Call Auction 2
Trade High Price	CHAR [10]	Character	This field has the highest traded price.
Trade Low Price	CHAR [10]	Character	This field has the lowest traded price.
Opening Price	CHAR [10]	Character	Security open price for the day
Closing Price	CHAR [10]	Character	Security close price for the day
Last Traded Price	CHAR [10]	Character	Security last traded price for the day
Previous Close Price	CHAR [10]	Character	Security previous day's close price
Total Traded Quantity (TTQ)	CHAR [12]	Character	Volume traded today for the security
Total Traded Value	CHAR [25]	Character	Total traded value for the security
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

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3.11 EOD – Master Addition/Modification/Deletion

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

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CA' 'CM' 'CD'	'CA' = Security added 'CM' = Security modified 'CD' = Security deleted
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Security Description	CHAR [30]	Character	Security Name
Regular Lot	CHAR [6]	Character	Lot Size
Market Type	CHAR [1]	Character	'N' = Normal 'O' = Odd Lot 'S' = Spot 'A' = Auction 'C' = Call Auction 'G' = Call Auction 2
Tick Size	CHAR [6]	Character	Tick size of security
Face Value	CHAR [9]	Character	Security face value
Issue Capital	CHAR [12]	Character	Security issued capital
Market Index Participation	CHAR [1]	Character	'Y' = Yes 'N' = No
Last Update Date & Time	CHAR [20]	Character	Format: DD-MON-YYYY HH:MM:SS
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

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3.12 EOD – Corporate Action Update

After market close, this information is disseminated to client as the "End of Day" (EOD) feed.

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CU'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Symbol	CHAR [10]	Character	Exchange-assigned security code.
Series	CHAR [2]	Character	Exchange-defined trading category or series of a security.
Instrument Type	CHAR [1]	Character	'0' = Equities '1' = Preference Shares '2' = Debentures '3' = Warrants '4' = Miscellaneous '5' = Others
Issue Capital	CHAR [12]	Character	Issue size of the security.
Face Value	CHAR [9]	Character	Security Face value
Market Lot	CHAR [6]	Character	Security market lot
Dividend/Interest Rate	CHAR [6]	Character	Dividend/Interest Rate
Record Date	CHAR [10]	Character	It represents the cutoff date for shareholders to be eligible for specific corporate action.
Book Closure Start Date	CHAR [10]	Character	Date at which the record books in the company for shareholder names starts.
Book Closure End Date	CHAR [10]	Character	Date at which the record books in the company for shareholder names ends.
Ex-Date	CHAR [10]	Character	Last date of trading before any corporate action.
No Delivery Start Date	CHAR [10]	Character	Date from when delivery of shares is stopped for book closure.

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No Delivery End Date	CHAR [10]	Character	No delivery end date.
Dividend	CHAR [1]	Character	'D' or Blank
Rights Flag	CHAR [1]	Character	'R' or Blank
Bonus Flag	CHAR [1]	Character	'B' or Blank
Interest Flag	CHAR [1]	Character	'I' or Blank
AGM Flag	CHAR [1]	Character	'A' or Blank
EGM Flag	CHAR [1]	Character	'E' or Blank
Others Flag	CHAR [1]	Character	'O' or Blank
Corp Data Type	CHAR [1]	Character	'B' = Book Closure 'R'= Record Date 'N'= None
Corp Action Description	CHAR [25]	Character	Descriptive information related to the corporate action applicable to the security.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer to section checksum calculation
End Of Trailer	CHAR [1]	'\r'	Carriage Return

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3.13 BOD & EOD Checksum Information

This message gives information about the number of messages (i.e. count) sent for each BOD & EOD message. This message will be sent multiple times a day. (i.e. After complete dissemination of any BOD/ EOD messages this message will be sent.)

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CZ'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO DATA + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Data Code	SHORT	'CT'/'CA'/CM'/ 'CD'/'CS'/CU'/ 'CQ'	Message code for which the count is sent.
Messages Count	CHAR [10]	Character	Message count for Data Code.
INFO TRAILER			
Checksum	SHORT	Numeric	Checksum is not calculated, so it is sent as 0 (Zero).
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.14 EOD – End of Feed Information

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

Field Name	Data Type	Value	Brief Description
INFO HEADER			
Code	SHORT	'CE'	
Length	SHORT	Numeric	Size of (INFO HEADER + INFO TRAILER)
Sequence Number	LONG	Numeric	Application sequence number
INFO DATA			
Not associated with any data			
INFO TRAILER			
Checksum	SHORT	Numeric	Checksum is not calculated, so it is sent as 0 (Zero)
End Of Trailer	CHAR [1]	'\r'	Carriage Return

3.15 Heartbeat Message

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

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

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4 Steps for Decompressing the Data Packets

4.1 LZO Algorithm Details

The LZO stands for Lempel Ziv Oberhaumer. It is a data compression library which is suitable for data Decompression in real-time. This means it favors speed over compression ratio.
LZO is written in ANSI C. Both the source code and the compressed data format are designed to be portable across platforms. This algorithm is freely available on the internet (URL: https://www.oberhumer.com/opensource/lzo/). It is made available by free software foundation. The algorithm is tested on various operating systems like UNIX and Red Hat Linux.

LZO implements several algorithms with the following features.

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

4.2 Files required for LZO algorithm

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

4.3 Decompression steps

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

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

Use the following function of LZO to Decompress.

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


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

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

Algorithm:

```
ST_NIFO_HEADER *pstInfoHeader;


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

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


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5 Checksum Calculation Algorithm

The checksum algorithm shall be applied to all data packet checksum calculations in accordance with the following guidelines:

- The checksum shall be computed only on the INFO DATA portion of the packet. The iLength parameter supplied to the checksum algorithm shall represent the actual length of the INFO DATA.
- The Header and Trailer fields shall be excluded from the checksum calculation. The checksum shall be derived solely from the data contained within the INFO DATA section.
- No special processing shall be performed for the Header, Trailer, null bytes, or the Checksum field itself during checksum computation.
- For messages containing text, the checksum shall be calculated using the actual message content length rather than the fixed message buffer length (239 bytes).

  Examples:

  Message: "DS : BSE exclusive securities will be enabled for trading in NSE at 12:35"
  Actual message length: 73 bytes

  Message: "Block deal market has opened for 04 SEP 2026"
  Actual message length: 44 bytes

  In the above examples, the checksum shall be calculated using the actual message content length along with the applicable data fields contained within the INFO DATA section, excluding the Header and Trailer fields.

The checksum calculation routine followed for the Info Vendor Feed is provided below:

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

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

// End of defines
unsigned check_sum (cData, iLength)
char *cData ;
int iLength;
{
        unsigned uAccum = 0;
        unsigned uData;
```

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

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

        return(uAccum);
}
```

6 Notes

6.1 Normal Market Session

All orders which are of regular lot size or multiples thereof are traded in the Normal Market. Normal market consists of various book types of wherein orders are segregated as Regular lot orders, Special Term orders, Negotiated Trade Orders and Stop Loss order depending on their order attributes. The market type for this session is 'N'.

6.2 Auction Market Session

In the Auction Market, auctions are initiated by the Exchange on behalf of trading members for settlement-related reasons. There are 3 participants in this market.

- Initiator - the party who initiates the auction process is called an initiator
- Competitor - the party who enters orders on the same side as the initiator
- Solicitor - the party who enters orders on the opposite side as of the initiator

In the auction market the Open price and the Last Traded Price would be zero till the auction ends and the auction price is calculated by the system. Since Auction in any scrip is done at a fixed price the High Price, Low Price, Closing Price and Index values are zero for all scrips traded in the Auction Market. The market type for this session is 'A'.

6.3 Preopen Session

Preopen session will be conducted for the Normal Market segment. The session will be conducted before the normal market start time. Exchange may decide to allow all or selective securities in preopen session.
During the preopen session, only order entry, orders modification and order cancellation will be allowed. Once the preopen session ends, no order activity will be allowed and the final open price (i.e. equilibrium price based on accumulated buy and sell orders) will be computed. Preopen orders will be matched at this final open price resulting in trade execution.

Preopen orders that could not participate in the preopen matching for reasons such as a demand-supply gap, order prices worse than the equilibrium price etc. shall be carried forward to the normal market. The time priority of such orders shall be retained.

In the above context NSE – Market Feed (Level 1, Level 2 & Level 3) product sends messages in the following sequence.

1. Preopen session start (PO) – market type 'N'
2. Market order restriction starts in preopen (PR): This is sent when market orders restriction starts during preopen session.
3. Security Update Information (PN) – Indicative open price in open price field
4. Preopen session end (PC) - market type 'N'

5. Security Update Information (PN) – Derived final open price in open price field and current security information
6. Security Update Information (CV) – This contains latest order and trade information of securities up to the order book depth of 20.
7. Normal Market open (CO) - market type 'N'
8. Security Update Information (CN) – With current security.
9. Normal Market Close (CC) - market type 'N'

6.4 Call Auction Session 2

IPO, Relisting, and illiquid securities call auction are done through this session. It is like the preopen session. Multiple sessions of this can be held on a trading day. The market type for this session is 'G.' IPO/Relisted securities get transferred to normal market session after deriving the open price.

In the above context NSE – Market Feed (Level 1, Level 2 & Level 3) product sends messages in the following sequence in one call auction session.

1. Preopen session start (PO) – market type 'G'

Call Auction Security Update Information (SN) – Indicative open price in open price field.

2. Preopen session end (PC) - market type 'G'

Security Update Information (SN) – Derived final open price in open price field and current security information.

For more details, please refer to NSE Circular CMTR23063

6.5 Buy Back Flag & Market Maker (BBMM Flag)

In call auction sessions 2 the buy back and market maker orders are allowed. To identify the buy back or market maker orders BBMM flag is sent in SN messages. For the probable values of BBMM flag refer to the table given below

1. BuyBBMMOrderExists: Buy Back or Market Maker order exists at buy side but not in top five price points.
2. SellBBMMOrderExists: Buy Back or Market Maker order exist at sell side but not in top five price points.
3. Sell BBMM Flag: Buy Back or Market Maker order at that price point.
4. Buy BBMM Flag: Buy Back or Market Maker order at that price point.

Buy Back Order Exists	Market Maker Order Exists	BuyBBMMOrderExists/ SellBBMMOrderExists/ Sell BBMM Flag/ Buy BBMM Flag
No	No	'0'
Yes	No	'1'
No	Yes	'2'
Yes	Yes	'3'

E.g. If Buy Back and Market Maker orders exist at price point then the above fields will contain '3'.

6.6 Closing Auction Session (CAS)

Closing Auction orders are Regular lot orders to be placed only on CAS eligible securities when normal market is in closing auction. Only limit orders and market orders are allowed in CAS. None of the following terms are attached: DQ, All or None, Minimum Fill and Trigger Price.
Unmatched limit orders of CTS (Continuous Trading Session) are cancelled or carried forward to the CAS without any change in time priority for CAS eligible securities.
Order modifications/ cancellations for market orders will not be allowed during CAS Market order restriction period. The trader cannot cancel market order of CAS eligible token during CAS Market order restriction period.
After order collection period in CAS, the Closing Auction matching will be done. Once matching is completed, all the pending unmatched orders will be cancelled by the system.
For more details, please refer to NSE Circular CMTR73362

In the above context NSE – Market Feed (Level 1, Level 2 & Level 3) product sends messages in the following sequence in closing auction session.

1. Normal market closed for securities in CAS (TR) - This is sent when normal market has closed for securities participating in closing auction session.
2. Price band of securities revised for CAS (RC) - This is sent when price band of securities revised for Closing Auction Session.
3. Closing auction session starts (AO) This is sent when closing auction session starts.
4. Market order restriction starts in CAS (MR) - This is sent when market orders restriction starts during closing auction session.
5. Closing auction session end (AC) - This is sent when closing auction session has ended.
6. CAS Reference Price (CR) - These packets consist of messages sent for CAS-enabled securities at the conclusion of the continuous trading session and prior to the commencement of the CAS session for those securities.

7 Acronyms Used

BOD	Begin Of Day Information
EOD	End Of Day Information
ONLINE	Information Sent During Market Timing
CM	Cash Market
F&O	Future & Options Market
CD	Currency Derivatives Market
WDM	Wholesale & Debt Market
COM	Commodity Market
CBRICS	Corporate Bond Reporting and Integrated Clearing System
RFQ	Request For Quote
NSE IX	NSE International Exchange
MTBT	Multicast Tick By Tick
LTP	Last Traded Price
ATO	At The Opening
TTQ	Total traded Quantity
LTQ	Last Traded Quantity
EGR	Electronic Gold Receipts
CAS	Closing Auction Session
CTS	Continuous Trading Session
IOP	Indicative Opening Price
VWAP	Volume Weighted Average Price

8 FAQs

1) For Sequenced Data Messages, why are fields defined with a data type of short while the value is specified as a character?

   The data sent by the server consists of numeric values that represent the ASCII codes of the corresponding characters. At the client end, these ASCII values need to be converted into their respective character representations.

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

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

3) How do we interpret Security Eligibility per Market in CT message type and Master Data security.txt file?

   The security.txt file does not populate the market type. It contains 12 fields as depicted below:

   |6|1|2|0|2|0|2|1|1|0|1|0|

   There are 12 consecutive fields which indicate Security status and Eligibility for 6 Markets.

   In these 12 fields the set of the first 2 fields represents the Normal market, and the set of the next 2 fields represents the odd lot market and so on.

   The market types are in the following sequence:
   1.Normal Market
   2.Odd lot Market
   3.Closing Auction
   4.Auction Market
   5.Call Auction1 (Not Used)
   6.Call Auction2

   In Real Time feed CT packet, we populate Market type separately.
   For e.g. **N**,0,1, **O**,0,1, **S**,0,1, **A**,0,1, **C**,0,1, **G**,1,1,

   N: Market type, 0: Eligibility, 1: Security status
   Here 1 security status belongs to N market type.
   O: Market type, 0: Eligibility, 1: Security status
   S: Market type, 0: Eligibility, 1: Security status
   A: Market type, 0: Eligibility, 1: Security status
   C: Market type, 0: Eligibility, 1: Security status
   G: Market type, 1: Eligibility, 1: Security status

4) What is Level 1, Level 2 and Level 3 Data?

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

- Level 1 provides the best Bid and best Ask price.
- Level 2 offers up to the best 5 Bids and Asks prices.
- Level 3 market depth offers a view of the best 20 Bids and Asks prices.

5) What structures are available for level 1, level 2 and level 3 feeds?

Packets Sent	Code	Level 1	Level 2	Level 3
3.1 BOD - Master Information	'CT'	✔	✔	✔
3.2 INAV Symbol mapping to NSE Symbol	'CQ'	✔	✔	✔
3.3 Online - Market Status Message	'PO' 'PR' 'PC' 'CO' 'CC' 'CK' 'CL' 'TC' 'RC' 'AO' 'MR' 'AC'	✔	✔	✔
3.4 Online – Touchline Market Update	'PN' 'CN' 'AN'	✔	-	-
3.5 Online – 5 Depth Market Update	'PN' 'CN' 'AN'	-	✔	✔
3.6 Online – 20 Depth Market update	'CV'	-	-	✔
3.7.2 Call Auction 2 (Touchline Market Update)	'SN'	✔	-	-
3.7.3 Call Auction 2 (5 Depth Market Update)	'SN'	-	✔	✔
3.8 Online - Broadcast Message	'CB'	✔	✔	✔
3.9 Online – CAS Reference Price Update	'CR'	✔	✔	✔
3.10 EOD – Market Statistics (Bhavcopy)	'CS'	✔	✔	✔
3.11 EOD – Master Addition/Modification/Deletion	'CA' 'CM' 'CD'	✔	✔	✔
3.12 EOD – Corporate Action Update	'CU'	✔	✔	✔
3.13 BOD & EOD Checksum Information	'CZ'	✔	✔	-

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3.14 EOD – End of Feed Information	'CE'	✔	✔	✔
3.15 Heartbeat Message	'CH'	✔	✔	✔

6) How is Security Tick Size to be interpreted?

In Real Time CT (BOD – Master Information) packet, Tick Size is in paise. While in EOD – Master Addition/Modification/Deletion, Tick Size is in INR.

7) What does an extra 'CC' packet mean on Call Auction 2 (Market Type 'G')?

The following table illustrates different market type messages received in a typical CM trading day. Please note that there could be a minor difference in auction timing depending on the random closing time:

Sr. No.	Market Type	Start Code	Start Time	End Code	End Time
1	G	PO	09:00:00	PC	10:14:13
2	N	PO	09:00:00	PC	09:07:12
3	G	PO	10:30:00	PC	11:14:52
4	G	PO	11:30:00	PC	12:14:48
5	G	PO	12:30:00	PC	13:41:41
6	G	PO	13:30:00	PC	14:14:16
7	G	PO	14:30:00	PC	15:14:03
8	N	CO	09:15:00	CC	15:30:00
9	O	CO	09:15:00	CC	15:30:00
10	N	CK	15:40:00	CL	16:00:00
11	A	CO	14:30:00	CC	15:15:00
12	G			CC	15:15:22

Meanings of codes are provided below:

Code	Meaning
PO	PreOpen/Call Auction Start
PC	PreOpen/Call Auction End
CO	Market Open for Market Type field
CC	Market Close for Market Type field
CK	Post close session start
CL	Post close session end

As of now, there are 6 sessions of Periodic Call Auction (Market Type 'G') as depicted in rows 1, 3, 4, 5, 6 and 7.

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The end code 'CC' for Market Type 'G' in the last row is an informative message to indicate the completion of all sessions of Periodic Call Auctions (Market Type 'G').

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

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

9) Is Indicative NAV (INAV) for ETFs available in L1, L2 or L3 feeds?

Yes, INAV data for ETFs is available in L1, L2, L3 feeds under existing message types.

10) There are quotes available for ETFs on NSE website. Even INAV is available in the Price information area. What do they represent?

Let's take an example of Bank Nifty ETF (Aditya Birla Sun Life Bank Nifty Bank ETF). Please note that this example has been taken for representation purposes only. This helps in better understanding of how NSE and INAV symbols are handled. The same principle applies for other ETFs.

The price in the quote window represents the LTP for NSE Symbol (ABSLBANETF). The INAV field in the Price Information area represents the Indicative Net Asset

Value for this ETF represented by INAV symbol (ABSLBAINAV). INAV symbol (ABSLBAINAV) is not available on the NSE Website.

11) What message types and field therein do we use to capture the INAV value in L1, L2 and L3 feeds?

The following table outlines the message type and fields populated.

Feed Level	Symbol Type	Message Type	NSE Symbol	Fields Populated	Price field
L1	INAV	CN	ABSLBAINAV	LTP, Close Price	LTP
L2	INAV	CN	ABSLBAINAV	LTP, Close Price	LTP
L3	INAV	CN	ABSLBAINAV	LTP, Close Price	LTP

For INAV symbol, LTP field contains the INAV value.

12) Will there be an impact if the NSE INAV mapping (CQ) packets are not managed at vendor side application?

We do not foresee any impact on the existing application at the vendor's side. These packets are useful for those who consume INAVs on real-time basis which is disseminated in the feed.

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13) Why are INAV values disseminated after market close in 'CV' packets of CM level 3 feed?

INAV is not calculated after-market hours. However, some Asset Management Companies (AMCs) continue to publish INAV values through the NSE AMC INAV system after trading hours. In CM Level 3 feed, the INAV closing value is available in the 'CN' packet until 3:30 p.m. After 3:30 p.m., please refer to the 'CV' packet for the closing value.

14) How do we identify and handle BSE-listed securities when duplicates exist?

When ingesting and processing BSE-listed securities, our system applies predefined rules to identify BSE-exclusive instruments and systematically resolve any symbol duplication to ensure uniqueness within NSE systems.

Identification of BSE-exclusive securities:

- All BSE-exclusive securities are internally identified by appending the "$" character to the symbol in the NSE symbol field.
- This suffix is used by the system to distinguish BSE-exclusive securities from NSE-listed securities.

Handling of duplicate Symbols:
If a symbol with the "$" suffix already exists, the following system-driven resolution logic is applied to generate a unique symbol:

1. First Iteration:
   - The system compares the first nine characters of the incoming symbol.
   - If a duplicate is detected, the 9th character is removed and replaced with "$".
2. Second and Third iteration:
   - If duplication persists, the system continues truncating the symbol by one additional character from the right in each iteration (up to a maximum of three iterations).
   - After each truncation, "$" is appended to maintain the BSE-exclusive identifier.
3. Post Third iteration:
   - If a unique symbol cannot be generated even after three iterations, the system skips processing of the affected record.

Example:

Scenario	Original Symbol	Modified Symbol	Explanation
1	INDIAHOTE	INDIAHOTE$	Since symbol is less than 10 characters, suffix "$" appended in system.
2	INDIAHOTEL	INDIAHO$$	After considering first 9 characters and appending $, is already present in the system then 9th character "E" shall be replaced by "$".

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3	INDIAHOTELS	INDIAH$$$	After considering first 8 characters, as per scenario 2, is already present in the system then 8th character "T" shall be replaced by "$".

Additional Notes:

- The symbol resolution logic is fully automated and handled internally.
- All security packets may contain a mix of NSE-listed and BSE-exclusive securities, with BSE-exclusive securities identifiable through the applied symbol conventions.

15) Why do some CV packets appear with delayed timestamps for certain securities?

CV packets are disseminated on a per-security basis. If no updated CV packet is generated for a security within the expected interval (approximately 6–9 seconds), the system retransmits the most recent CV packet for that security. In such scenarios, the retransmitted packet may contain an older packet timestamp, while the dissemination time reflects the current broadcast time. All data within the packet remains unchanged.

This behavior is expected, particularly for illiquid securities where market activity is infrequent, and it ensures continuity of the CV feed even when no new updates are available.
The initial CV packet is disseminated within 6–9 seconds. Thereafter, subsequent packets—whether updated or retransmitted—are broadcast at 5-second intervals.

As per the current configuration, the CV packets for illiquid securities will be retransmitted twice.

16) What are the timings of Closing Auction Session (CAS) packets?

Below table represents the timings when CAS packets are disseminated:

Sr. No.	Message Type	Timings	Frequency
1	TC	15:15:00	1
2	CR	15:15:00 – 15:20:00	Once per security
3	RC	15:15:01	1
4	AO	15:20:00	1
5	AN	Received after AO	Multiple
6	MR	15:25:00	1
7	AC	15:28:00 - 15:30:00	1

9 Support Information

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