CORPORATE DATA

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NSE DATA & ANALYTICS LIMITED
EXCHANGE PLAZA,
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Revision History

Name	Description	Date
Version 2.3	Removal of TCP/IP Session Initialization, Login Request, Login Response.	11 November 2022
Version 2.4	• Addition of Code field in all Info headers • Addition of Data Type section • Increased CA attachment filename size from 100 to 200 bytes in Corporate Announcement & Quick Result	19 December 2024

Table of Contents

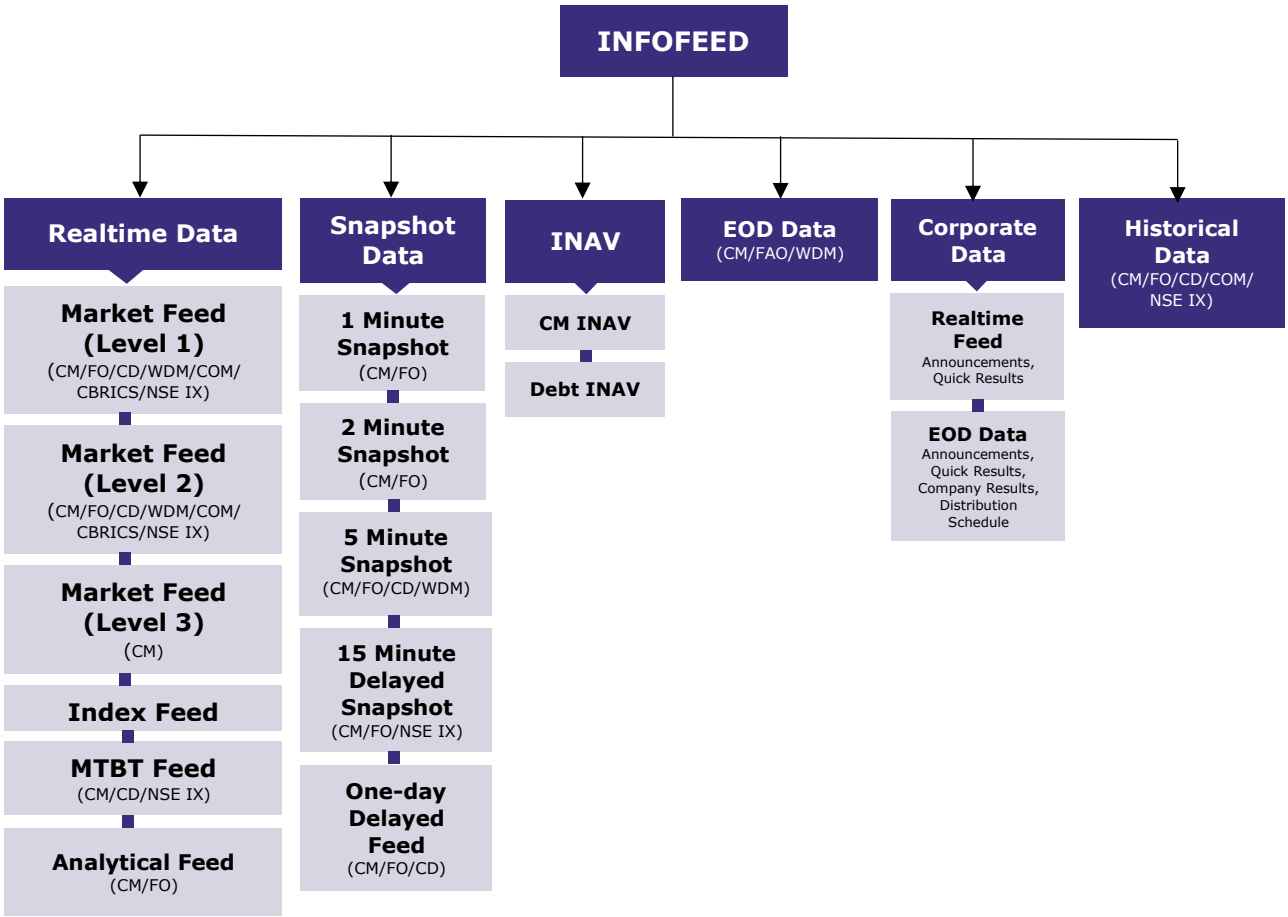
Corporate Data - Realtime Data Technical Specification

1. Introduction

NSE Data & Analytics Ltd. disseminates NSEIL's real time broadcast data to various information agencies. It provides 7 different types of data products viz.

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

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



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

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

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

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

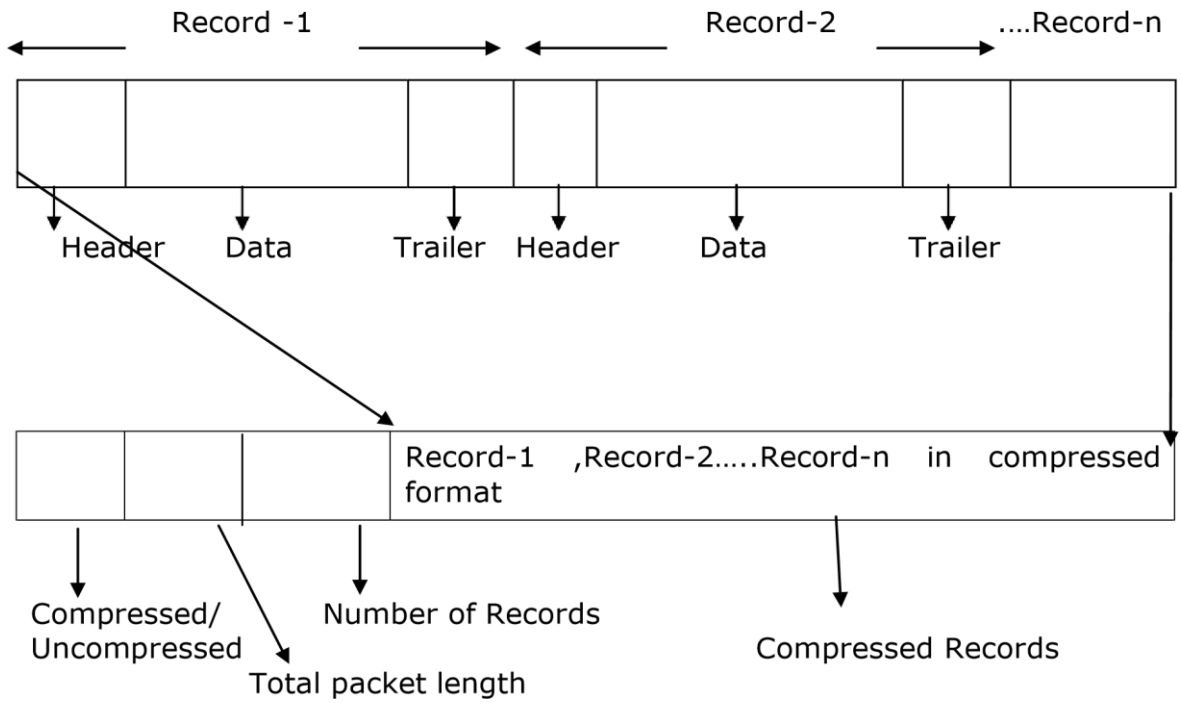
The feed consists of series of sequenced and unsequenced variable length compressed messages. The compression algorithm used over here is LZO – Compression.

In Realtime Corporate Data product information will be disseminated from 02:00 to 22:30 (IST) by the application as follows:

1. Corporate Announcements – (Realtime)
2. Company Results – (End of Day)
   a. Company Financial Result
   b. Segment wise Result
3. Distribution schedule – (End of Day)
   a. Shareholding Pattern Declaration
   b. Shareholding Pattern Details
   c. Promoters Shareholding Details
   d. Public Shareholding Details
   e. Non-Promoter-Non-Public Shareholding Details
   f. Details of Promoter Shareholding Which Remain Unclaimed
   g. Details of Shareholders Acting as Persons in Concert
   h. Details of Public Shareholding Which Remain Unclaimed

2. Connection Details

2.1 Packet Format



Compressed/Uncompressed:
This field tells whether packet is compressed or not compressed.

If this Field = 0 then Compressed.
else if Field = 1 then Uncompressed.

Number of Records:
This field tells the number of records present in the compressed packets.

Packet length:
This field specifies the total packet length.

```
Structure COM_HEADER
{
     char cCompOrNot;
    short iPackLen;
     short iNoOfPack;
};
```

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

2.2 Data Types

Data types used in feed:

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

3. Data Details

The real time data is disseminated in the form of multicast packets and each single packet is generated by the application with a definite structure i.e. Header, Data body and Trailer.

The Header

The header in turn consists of 3 fields – Code, Length and Sequence number. The details of these fields are explained as below.

- **Code** – It is a short data type field that provides the information about the type of data that each packet contains.
- **Length** – It is a 2-byte short data type field that provides the length of record within each packet of NSEIL real time data. This includes the length of Header, Data and Trailer.
- **Sequence Number** – It is a 4-byte ASCII field that provides the sequence number of each packet that is disseminated in NSEIL real time data. Corporate Announcement, Company Result and Distribution Schedule packets maintain its own sequence number. All the three sequence numbers will start from 1 every day. When there is no data to disseminate, application will send the heartbeat signal. Heartbeat sequence number is also maintained separately.

The Data Body

The following information is provided in data block -

a. Corporate Announcement
b. Company Result
c. Segment Wise Result
d. Shareholding Pattern Declaration
e. Shareholding Pattern Details
f. Promoters Shareholding Details
g. Public Shareholding Details
h. Non-Promoter-Non-Public Shareholding Details
i. Details of Promoter Shareholding Which Remain Unclaimed
j. Details of Shareholders Acting as Persons in Concert
k. End of Feed
l. Heartbeat Signal
m. Details of Public Shareholding Which Remain Unclaimed

The Trailer

- Trailer contains a 2-byte checksum and an end of trailer character.
- Checksum is calculated using the algorithm given in section Checksum Calculation
- End of trailer character is '\r'.

4. Data Structure Details

4.1 Corporate Announcement & Quick Result

Corporate Announcement & Quick Result packet will be sent by the application as and when any announcement or quick result is published by the Exchange.

Field Name	Data Type	Value	Brief Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0' = Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets * Size of (Info Header + Data + Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1004	Transcode
Length	SHORT	Numeric	Sizeof (Info Header + Data + Info Trailer)
Sequence Number	LONG	Numeric	CA Sequence number
DATA			
Symbol	CHAR [11]	Character	Security Symbol
CA Description	CHAR [65]	Character	Brief description about announcements or financial result update
CA Details	CHAR [2048]	Character	Details about the announcement or quick financial result
CA Date	CHAR [13]	Character	Announcement date (DDMMYYYYHHmm)
CA Attachment File Name	CHAR [200]	Character	Attachment filename
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

Corresponding Attachment file shall be available over SFTP. Please refer section About SFTP for information on SFTP Protocol.

4.2 Company Result

4.2.1 Company Financial Result

Company Financial Result packet will be sent by the application as and when any result is published on the Exchange.

Field Name	Data Type	Value	Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0' = Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1005	Transcode
Length	SHORT	Numeric	Sizeof (Info Header + Data + Info Trailer)
Sequence Number	LONG	Numeric	CR Sequence number
DATA			
Result Sequence Number	LONG	Numeric	This result record sequence number is referred in 'Segment Wise Result' packet structure
Symbol	CHAR [11]	Character	Security Symbol
Category	CHAR [1]	Character	'B' – Banking, 'N' - Nonbanking, 'A' - Alternative
From Date	CHAR [11]	Character	Result Period From [YYYY-MM-DD]
To Date	CHAR [11]	Character	Result Period To [YYYY-MM-DD]

Result Type	CHAR [3]	Character	Audited (A), Unaudited(U), Project Status Report
Period Type	CHAR [3]	Character	"Q1" = Quarter 1, "Q2" =Quarter 2, "Q3" =Quarter 3, "Q4" =Quarter 4, "H1" =Half Yearly, "AN" =Annual, "OT" =Others
Cumulative Noncumulative	CHAR [1]	Character	'C' = Cumulative, 'N' = Noncumulative
Consolidated Non Consolidated	CHAR [1]	Character	'C' = Consolidated, 'N' = Nonconsolidated
Net Sales Income	DOUBLE	Numeric	Net Sales Income
Other Income	DOUBLE	Numeric	Other Income
Total Income1	DOUBLE	Numeric	Total Income1
Increase in Stock in Trade	DOUBLE	Numeric	Increase in Stock in Trade
Consumption of raw materials	DOUBLE	Numeric	Consumption of raw materials
Employee Cost	DOUBLE	Numeric	Employee Cost
Total Expenditure1	DOUBLE	Numeric	Total Expenditure1
Other Expenditure	DOUBLE	Numeric	Other Expenditure
Total Expenditure2	DOUBLE	Numeric	Total Expenditure2
Interest	DOUBLE	Numeric	Interest
PBDT	DOUBLE	Numeric	Gross profit after interest
Depreciation	DOUBLE	Numeric	Depreciation
Profit (+)/Loss (-) from Ordinary Activities before Tax	DOUBLE	Numeric	Profit (+)/Loss (-) from Ordinary Activities before Tax
Tax Expenses	DOUBLE	Numeric	Tax Expenses
Other Provision	DOUBLE	Numeric	Other Provision
Misc expenditure w/o	DOUBLE	Numeric	Misc expenditure w/o

Net Profit (+)/Loss (-) for the Period	DOUBLE	Numeric	Net Profit (+)/Loss (-) for the Period
Non-Rec Income	DOUBLE	Numeric	Non-Rec Income
Non-Rec Expenses	DOUBLE	Numeric	Non-Rec Expenses
Adjusted net profit	DOUBLE	Numeric	Adjusted net profit
Face value of share (In Rs.)	DOUBLE	Numeric	Face value of share (In Rs.)
Paid-up equity share capital	DOUBLE	Numeric	Paid-up equity share capital
Reserves excluding revaluation reserves	DOUBLE	Numeric	Reserves excluding revaluation reserves
Dividend (%)	FLOAT	Numeric	Dividend (%)
Basic EPS after Extraordinary Items (In Rs.)	DOUBLE	Numeric	Basic EPS after Extraordinary Items (In Rs.)
Diluted EPS after Extraordinary Items (In Rs.)	DOUBLE	Numeric	Diluted EPS after Extraordinary Items (In Rs.)
Non-promoter shareholding (Nos.)	DOUBLE	Numeric	Non-promoter shareholding (Nos.)
Non-promoter shareholding (%)	FLOAT	Numeric	Non-promoter shareholding (%)
Public shareholding (Nos.)	DOUBLE	Numeric	Public shareholding (Nos.)
Public shareholding (%)	FLOAT	Numeric	Public shareholding (%)
Interest/discount on advances/bills	DOUBLE	Numeric	Interest/discount on advances/bills
Income on Investments	DOUBLE	Numeric	Income on Investments
balances with RBI and other interbank funds	DOUBLE	Numeric	balances with RBI and other interbank funds
Others	DOUBLE	Numeric	Others
Interest Earned	DOUBLE	Numeric	Interest Earned

Total Income2	DOUBLE	Numeric	Total Income2
Interest Expended	DOUBLE	Numeric	Interest Expended
Payment to and provisions for employees	DOUBLE	Numeric	Payment to and provisions for employees
Other operating expenses	DOUBLE	Numeric	Other operating expenses
Operating Expenses	DOUBLE	Numeric	Operating Expenses
Total Expenditures excluding Provisions & Contingencies	DOUBLE	Numeric	Total Expenditures excluding Provisions & Contingencies
Operating Profit before Provisions & Contingencies	DOUBLE	Numeric	Operating Profit before Provisions & Contingencies
Provisions (Other than Tax) & Contingencies	DOUBLE	Numeric	Provisions (Other than Tax) & Contingencies
Shares held by Government of India (%)	FLOAT	Numeric	Shares held by Government of India (%)
Capital Adequacy Ratio	DOUBLE	Numeric	Capital Adequacy Ratio
Gross Profit	DOUBLE	Numeric	0 If Result Is Banking or Non-Banking
Operating Profit before interest and depreciation	DOUBLE	Numeric	0 If Result Is Banking or Non-Banking
General Administrative Expenses	DOUBLE	Numeric	0 If Result Is Banking or Non-Banking
Sell distribution	DOUBLE	Numeric	0 If Result Is Banking or Non-Banking
Operating Profit after interest and depreciation	DOUBLE	Numeric	0 If Result Is Banking or Non-Banking
FRF Flag	CHAR [1]	Character	'V' = Revision, 'F' = Refilling, 'G' = Regrouping, 'N' = None (No Change)

FRF Link	INT	Numeric	FRF Link
Result Create Date	CHAR [21]	Character	For Revision/Refilling/Re grouping "On Date" Format (DD-MON- YYYY HH24:MI:SS)
Purchase of Traded Goods	DOUBLE	Numeric	Purchase of Traded Goods
Depreciation	DOUBLE	Numeric	Depreciation
Exceptional Items	DOUBLE	Numeric	Exceptional Items
Net Profit (+)/Loss (-) from ordinary Activities after Tax	DOUBLE	Numeric	Net Profit (+)/Loss (-) from ordinary Activities after Tax
Extraordinary Items	DOUBLE	Numeric	Extraordinary Items
Minority Interest	DOUBLE	Numeric	Minority Interest
Share of Associates	DOUBLE	Numeric	Share of Associates
Other related Items (Consolidated)	DOUBLE	Numeric	Other related Items (Consolidated)
Consolidated Net Profit (+)/Loss (-) for the Period	DOUBLE	Numeric	Consolidated Net Profit (+)/Loss (-) for the Period
Basic EPS before Extraordinary Items (In Rs.)	DOUBLE	Numeric	Basic EPS before Extraordinary Items (In Rs.)
Diluted EPS before Extraordinary Items	DOUBLE	Numeric	Diluted EPS before Extraordinary Items
Gross/Net NPA	DOUBLE	Numeric	Gross/Net NPA
Percentage Gross/Net NPA	FLOAT	Numeric	Percentage Gross/Net NPA
Return on Assets	DOUBLE	Numeric	Return on Assets
Operating Profit before Interest	DOUBLE	Numeric	Operating Profit before Interest
Operating Profit after Interest and Exceptional Items	DOUBLE	Numeric	Operating Profit after Interest and Exceptional Items
Other Operating Income	DOUBLE	Numeric	Other Operating Income

Profits from operations before Other Income, Interest & Exceptional Items	DOUBLE	Numeric	Profits from operations before Other Income, Interest & Exceptional Items
Other Income 2	DOUBLE	Numeric	Other Income
Profit before Interest & Exceptional Items	DOUBLE	Numeric	Profit before Interest & Exceptional Items
Interest 2	DOUBLE	Numeric	Interest
Profit after Interest but before Exceptional Items	DOUBLE	Numeric	Profit after Interest but before Exceptional Items
Exceptional Items 2	DOUBLE	Numeric	Exceptional Items
Result Remarks	CHAR [2001]	Character	Result Remarks
Segment Information Remarks	CHAR [2001]	Character	Segment Information Remarks
Date Time stamp	CHAR [15]	Character	DDMMYYYYHHMMSS format
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

4.2.2 Segment Wise Result

Segment wise result packet will be sent by application as and when it is published on the Exchange.

Field Name	Data Type	Value	Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0' = Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1006	Transcode
Length	SHORT	Numeric	Sizeof (Info Header + Data + Info Trailer)
Sequence Number	LONG	Numeric	CA Sequence number
DATA			
Company Result reference sequence Number	LONG	Numeric	Reference to the 'Company Result' record sequence number
Segment Type	CHAR [3]	Character	"CE" = Capital Employed, "RE" = Results, "RV" = Revenue
Primary Segment Name	CHAR [51]	Character	Primary Segment Name
Secondary Segment Name	CHAR [51]	Character	Secondary Segment Name
Segment Value	DOUBLE	Numeric	Segment Value
Field to be added or subtracted	CHAR [1]	Character	'A' = Added, 'S' = Subtracted
Date Time stamp	CHAR [15]	Character	DDMMYYYYHHMMSS format
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation

End Of Trailer	CHAR [1]	Character	'\r'

4.3 Distribution Schedule

4.3.1 Shareholding Pattern Declaration

Shareholding Pattern Declaration packet structure comes under the Distribution Schedule.

Field Name	Data Type	Value	Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0' = Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1007	Transcode
Length	SHORT	Numeric	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	LONG	Numeric	DS Sequence number
DATA			
Symbol	CHAR [11]	Character	Security symbol
Series	CHAR [3]	Character	Series type (e.g. EQ)
Security Name	CHAR [151]	Character	Security Name
Company Name	CHAR [151]	Character	Company Name
As On Date	CHAR [12]	Character	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format
Sr. No.	CHAR [6]	Character	Shareholder category code
Particulars	CHAR [101]	Character	Shareholder category description

Promotor & Promotor Group	CHAR [11]	Character	Shareholder category type
Public	CHAR [4]	Character	Shareholder category type
Non-Promotor Non-Public	CHAR [4]	Character	Shareholder category type
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

4.3.2 Shareholding Pattern Details

Shareholding Pattern details packet structure comes under the Distribution Schedule. This packet will be sent by the application as End of Day feed.

Field Name	Data Type	Value	Description
Compressed or not	CHAR [1]	Character	'0' = Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1008	Transcode
Length	SHORT	Numeric	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	LONG	Numeric	DS Sequence number
DATA			
Symbol	CHAR [11]	Character	Security symbol
Series	CHAR [3]	Character	Series type (e.g. EQ)
Security Name	CHAR [151]	Character	Security Name
Company Name	CHAR [151]	Character	Company Name
As On Date	CHAR [12]	Character	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format
Category	CHAR [51]	Character	Shareholder category code
Category of shareholder	CHAR [101]	Character	Shareholder category description
Number of shareholders	LONG LONG	Numeric	Number of shareholders
Number of shareholders	LONG LONG	Numeric	Number of fully paid-up equity shares held
Number of Partly paid-up equity shares held	LONG LONG	Numeric	Number of Partly paid- up equity shares held
Number of shares underlying	LONG LONG	Numeric	Number of shares underlying Depository Receipts

Depository Receipts			
Total number of shares held	LONG LONG	Numeric	Total number of shares held
Shareholding as a % of total number of shares (calculated as per SCRR, 1957) As a % of (A+B+C2)	DOUBLE	Numeric	Total Share held percentage
Number of Voting Rights held in each class of securities Class eg: X	LONG LONG	Numeric	Number of Voting Rights held in each class of securities Class eg: X
Number of Voting Rights held in each class of securities Class eg: Y	LONG LONG	Numeric	Number of Voting Rights held in each class of securities Class eg: Y
Number of Voting Rights held in each class of securities: total	LONG LONG	Numeric	Number of Voting Rights held in each class of securities: total
Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)	DOUBLE	Numeric	Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)
Number of Shares Underlying Outstanding convertible securities (including warrants)	LONG LONG	Numeric	Number of Shares Underlying Outstanding convertible securities (including Warrants)
Shareholding, as a % assuming full conversion of convertible securities (as a percentage of diluted share capital) As a % of (A+B+C2)	DOUBLE	Numeric	Shareholding, as a % assuming full conversion of convertible securities (as a percentage of diluted share capital) As a % of (A+B+C2)
Number of Locked in shares	LONG LONG	Numeric	Number of Locked in shares
Number of Locked in shares as a % of total Shares held	DOUBLE	Numeric	Number of Locked in shares as a % of total Shares held

Number of Shares pledged or otherwise encumbered	LONG LONG	Numeric	Number of Shares pledged or otherwise encumbered
Number of Shares pledged or otherwise encumbered as a % of total Shares held	DOUBLE	Numeric	Number of Shares pledged or otherwise encumbered as a % of total Shares held
Number of equity shares held in dematerialized form	LONG LONG	Numeric	Number of equity shares held in dematerialized form
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

4.3.3 Promoters Shareholding Details

Promoters Shareholding details packet structure comes under the Distribution Schedule. This packet will be sent by the application as End of Day feed.

Field Name	Data Type	Value	Description
COM HEADER			
Compressed or not	CHAR [1]	Character	'0'= Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1009	Transcode
Length	SHORT	Numeric	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	LONG	Numeric	DS Sequence number
DATA			
Symbol	CHAR [11]	Character	Security symbol
Series	CHAR [3]	Character	Series type (e.g. EQ)
Security Name	CHAR [151]	Character	Security Name
Company Name	CHAR [151]	Character	Company Name
As On Date	CHAR [151]	Character	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format
Category	CHAR [51]	Character	Shareholder category code
PAN	CHAR [11]	Character	PAN number of shareholder
Category of shareholder	CHAR [101]	Character	Shareholder category description
Number of shareholders	LONG LONG	Numeric	Number of shareholders

Number of fully paid-up equity shares held	LONG LONG	Numeric	Number of fully paid-up equity shares held
Number of Partly paid-up equity shares held	LONG LONG	Numeric	Number of Partly paid- up equity shares held
Number of shares underlying Depository Receipts	LONG LONG	Numeric	Number of shares underlying Depository Receipts
Total number of shares held	LONG LONG	Numeric	Total number of shares held
Shareholding as a % of total number of shares (calculated as per SCRR, 1957) As a % of (A+B+C2)	DOUBLE	Numeric	Total Share held percentage
Number of Voting Rights held in each class of securities Class eg: X	LONG LONG	Numeric	Number of Voting Rights held in each class of securities Class eg: X
Number of Voting Rights held in each class of securities Class eg: Y	LONG LONG	Numeric	Number of Voting Rights held in each class of securities Class eg: Y
Number of Voting Rights held in each class of securities: total	LONG LONG	Numeric	Number of Voting Rights held in each class of securities: total
Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)	DOUBLE	Numeric	Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)
Number of Shares Underlying Outstanding convertible securities (including Warrants)	LONG LONG	Numeric	Number of Shares Underlying Outstanding convertible securities (including Warrants)
Shareholding, as a % assuming full conversion of convertible securities (as a percentage of diluted share capital) As a % of (A+B+C2)	DOUBLE	Numeric	Shareholding, as a % assuming full conversion of convertible securities (as a percentage of diluted share capital) As a % of (A+B+C2)

Number of Locked in shares	LONG LONG	Numeric	Number of Locked in shares
Number of Locked in shares as a % of total Shares held	DOUBLE	Numeric	Number of Locked in shares as a % of total Shares held
Number of Shares pledged or otherwise encumbered	LONG LONG	Numeric	Number of Shares pledged or otherwise encumbered
Number of Shares pledged or otherwise encumbered as a % of total Shares held	DOUBLE	Numeric	Number of Shares pledged or otherwise encumbered as a % of total Shares held
Number of equity shares held in dematerialized form	LONG LONG	Numeric	Number of equity shares held in dematerialized form
Parent ID	LONG LONG	Numeric	Unique parent ID which is used for mapping and aggregation.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

Under Any Other Category in Category field, if subsequent packet has NULL field populated under Category code, in this case a new Category of shareholder will be defined. Subsequent packets will contain a unique Parent ID for mapping and aggregation of shareholding details.

4.3.4 Public Shareholding Details

Public Shareholding details packet structure comes under the Distribution Schedule. This packet will be sent by the application as End of Day feed.

Field Name	Data Type	Value	Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0' = Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1010	Transcode
Length	SHORT	Numeric	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	LONG	Numeric	DS Sequence number
DATA			
Symbol	CHAR [11]	Character	Security symbol
Series	CHAR [3]	Character	Series type (e.g. EQ)
Security Name	CHAR [151]	Character	Security Name
Company Name	CHAR [151]	Character	Company Name
As On Date	CHAR [12]	Character	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format
Category	CHAR [51]	Character	Shareholder category code
PAN	CHAR [11]	Character	PAN number of shareholder
Category of shareholder	CHAR [101]	Character	Shareholder category description
Number of shareholders	LONG LONG	Numeric	Number of shareholders

Number of fully paid-up equity shares held	LONG LONG	Numeric	Number of fully paid-up equity shares held
Number of Partly paid-up equity shares held	LONG LONG	Numeric	Number of Partly paid- up equity shares held
Number of shares underlying Depository Receipts	LONG LONG	Numeric	Number of shares underlying Depository Receipts
Total number of shares held	LONG LONG	Numeric	Total number of shares held
Shareholding as a % of total number of shares (Calculated as per SCRR, 1957) As a % of (A+B+C2)	DOUBLE	Numeric	Total Share held percentage
Number of Voting Rights held in each class of securities Class eg: X	LONG LONG	Numeric	Number of Voting Rights held in each class of securities Class eg: X
Number of Voting Rights held in each class of securities Class eg: Y	LONG LONG	Numeric	Number of Voting Rights held in each class of securities Class eg: Y
Number of Voting Rights held in each class of securities: total	LONG LONG	Numeric	Number of Voting Rights held in each class of securities: total
Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)	DOUBLE	Numeric	Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)
Number of Shares Underlying Outstanding convertible securities (including Warrants)	LONG LONG	Numeric	Number of Shares Underlying Outstanding convertible securities (including Warrants)
Shareholding, as a % assuming full conversion of convertible securities (as a percentage of	DOUBLE	Numeric	Shareholding, as a % assuming full conversion of convertible securities (as a percentage of diluted share capital) As a % of

diluted share capital) As a % of (A+B+C2)			(A+B+C2)
Number of Locked in shares	LONG LONG	Numeric	Number of Locked in shares
Number of Locked in shares as a % of total Shares held	DOUBLE	Numeric	Number of Locked in shares as a % of total Shares held
Number of Shares pledged or otherwise encumbered	LONG LONG	Numeric	Number of Shares pledged or otherwise encumbered
Number of Shares pledged or otherwise encumbered as a % of total Shares held	LONG LONG	Numeric	Number of Shares pledged or otherwise encumbered as a % of total Shares held
Number of equity shares held in dematerialized form	LONG LONG	Numeric	Number of equity shares held in dematerialized form
Parent ID	LONG LONG	Numeric	Unique parent ID which is used for mapping and aggregation.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

Under Any Other Category in Category field, if subsequent packet has NULL field populated under Category code, in this case a new Category of shareholder will be defined. Subsequent packets will contain a unique Parent ID for mapping and aggregation of shareholding details.

4.3.5 Non-Promoter Non-Public Shareholding Details

Non-Promoter – Non-Public shareholding details packet structure comes under the Distribution Schedule. This packet will be sent by the application as End of Day feed.

Field Name	Data Type	Value	Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0'= Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1011	Transcode
Length	SHORT	Numeric	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	LONG	Numeric	DS Sequence number
DATA			
Symbol	CHAR [11]	Character	Security symbol
Series	CHAR [3]	Character	Series type (e.g. EQ)
Security Name	CHAR [151]	Character	Security Name
Company Name	CHAR [151]	Character	Company Name
As On Date	CHAR [12]	Character	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format

Category	CHAR [51]	Character	Shareholder category code
PAN	CHAR [11]	Character	PAN number of shareholder
Category of shareholder	CHAR [101]	Character	Shareholder category description
Number of shareholders	LONG LONG	Numeric	Number of shareholders
Number of fully paid-up equity shares held	LONG LONG	Numeric	Number of fully paid-up equity shares held
Number of Partly paid-up equity shares held	LONG LONG	Numeric	Number of Partly paid- up equity shares held
Number of shares underlying Depository Receipts	LONG LONG	Numeric	Number of shares underlying Depository Receipts
Total number of shares held	LONG LONG	Numeric	Total number of shares held
Shareholding as a % of total number of shares (Calculated as per SCRR, 1957) As a % of (A+B+C2)	DOUBLE	Numeric	Total Share held percentage
Number of Voting Rights held in each class of securities Class eg: X	LONG LONG	Numeric	Number of Voting Rights held in each class of securities Class eg: X
Number of Voting Rights held in each class of securities Class eg: Y	LONG LONG	Numeric	Number of Voting Rights held in each class of securities Class eg: Y
Number of Voting Rights held in each class of securities: total	LONG LONG	Numeric	Number of Voting Rights held in each class of securities: total
Number of Voting Rights held in each class of securities:	DOUBLE	Numeric	Number of Voting Rights held in each class of securities:
Total as a % of (A+B+C)		Numeric	Total as a % of (A+B+C)

Number of Shares Underlying Outstanding convertible securities (including Warrants)	LONG LONG	Numeric	Number of Shares Underlying Outstanding convertible securities (including Warrants)
Shareholding, as a % assuming full conversion of convertible securities (as a percentage of diluted share capital) As a % of (A+B+C2)	DOUBLE	Numeric	Shareholding, as a % assuming full conversion of convertible securities (as a percentage of diluted share capital) As a % of (A+B+C2)
Number of Locked in shares	LONG LONG	Numeric	Number of Locked in shares
Number of Locked in shares as a % of total Shares held	DOUBLE	Numeric	Number of Locked in shares as a % of total Shares held
Number of Shares pledged or otherwise encumbered	LONG LONG	Numeric	Number of Shares pledged or otherwise encumbered
Number of Shares pledged or otherwise encumbered as a % of total Shares held	DOUBLE	Numeric	Number of Shares pledged or otherwise encumbered as a % of total Shares held
Number of equity shares held in dematerialized form	LONG LONG	Numeric	Number of equity shares held in dematerialized form
Parent ID	LONG LONG	Numeric	Unique parent ID which is used for mapping and aggregation.
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

Under Any Other Category in Category field, if subsequent packet has NULL field populated under Category code, in this case a new Category of shareholder will be defined. Subsequent packets will contain a unique Parent ID for mapping and aggregation of shareholding details.

4.3.6 Details of Promoter Shareholding Which Remain Unclaimed

This packet structure comes under the Distribution Schedule. It contains the details of Promoters Shareholding which remain unclaimed may be given here along with details such as number of shareholders, outstanding shares held in demat/unclaimed suspense account, voting rights which are frozen etc. This packet will be sent by the application as End of Day feed.

Field Name	Data Type	Value	Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0'= Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1011	Transcode
Length	SHORT	Numeric	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	LONG	Numeric	DS Sequence number
DATA			
Symbol	CHAR [11]	Character	Security symbol
Series	CHAR [3]	Character	Series type (e.g. EQ)
Security Name	CHAR [151]	Character	Security Name
Company Name	CHAR [151]	Character	Company Name
As On Date	CHAR [12]	Character	Distribution Schedule provided is recorded on this date.Date in DD-MMM- YYYY format
Number of shareholders	LONG LONG	Numeric	Number of shareholders
Number of Shares held	LONG LONG	Numeric	Number of shares held

INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

4.3.7 Details of Shareholders Acting as Persons In Concert

Details of Shareholders acting as persons in Concert packet structure comes under the Distribution Schedule. This packet will be sent by the application as End of Day feed.

Field Name	Data Type	Value	Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0'= Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1012	Transcode
Length	SHORT	Numeric	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	LONG	Numeric	DS Sequence number
DATA			
Symbol	CHAR [11]	Character	Security symbol
Series	CHAR [3]	Character	Series type (e.g. EQ)
Security Name	CHAR [151]	Character	Security Name
Company Name	CHAR [151]	Character	Company Name
As On Date	CHAR [12]	Character	Distribution Schedule provided is recorded on this date. Date in DD-MMM-YYYY format
Name of shareholder	CHAR [301]	Character	Name of shareholder
Name of PAC	CHAR [301]	Character	Name of PAC

Number of shareholders	LONG LONG	Numeric	Number of shareholders
Holding %	DOUBLE	Numeric	Holding %
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

4.3.8 Details of Public Shareholding Which Remain Unclaimed

This packet structure comes under the Distribution Schedule. It consists of details of Public Shareholding which remain unclaimed may be given here along with details such as number of shareholders, outstanding shares held in demat/unclaimed suspense account, voting rights which are frozen etc. This packet will be sent by the application as End of Day feed.

Field Name	Data Type	Value	Description
COMP HEADER			
Compressed or not	CHAR [1]	Character	'0'= Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets *Size of (Info Header+ Data+ Info Trailer))
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Code	SHORT	1013	Transcode
Length	SHORT	Numeric	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	LONG	Numeric	DS Sequence number
DATA			
Symbol	CHAR [11]	Character	Security symbol
Series	CHAR [3]	Character	Series type (e.g. EQ)
Security Name	CHAR [151]	Character	Security Name
Company Name	CHAR [151]	Character	Company Name

As On Date	CHAR [12]	Character	Distribution Schedule provided is recorded on this date. Date in DD-MMM-YYYY format
Number of shareholders	LONG LONG	Numeric	Number of shareholders
Number of Shares held	LONG LONG	Numeric	Number of Shares held
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section 6. Checksum Calculation
End Of Trailer	CHAR [1]	Character	‘\r’

4.4 End of the Feed

This packet will indicate that the online feed dissemination is complete and offline data dissemination will start.

Field Name	Data Type	Value	Description
COM HEADER			
Compressed or not	CHAR [1]	Character	'0' = Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets * Size of (Info Header + Data + Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Length	SHORT	Numeric	Sizeof (Info Header + Data + Info Trailer)
Sequence Number	LONG	Numeric	Always 0
DATA			
Not associated with any data.			
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

4.5 Heartbeat Signal

The Heartbeat packets are sent throughout the day from 02:00 to 22:30 (IST) This packet indicates to the Info-Vendors that data packets are received from the application. A separate sequence number will be maintained for Heartbeat signal.

Field Name	Data Type	Value	Description
COM HEADER			
Compressed or not	CHAR [1]	Character	'0' = Compressed, '1' = Uncompressed
Packet Length	SHORT	Numeric	Number of Packets * Size of (Info Header + Data + Info Trailer)
Number of Packets	SHORT	Numeric	Number of records
INFO HEADER			
Length	SHORT	Numeric	Sizeof (Info Header + Data + Info Trailer)
Sequence Number	LONG	Numeric	Heartbeat packet sequence number
DATA			
Not associated with any ASCII data.			
INFO TRAILER			
Checksum	SHORT	Numeric	Refer section Checksum Calculation
End Of Trailer	CHAR [1]	Character	'\r'

5 Steps for Decompressing the Data Packets

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.
- Compression is fast.
- Requires 64 KB of memory for compression.
- Allows you to dial up extra compression at a speed cost in the Compressor.
- The speed of the decompression is not reduced.
- Includes compression levels for generating pre-compressed data which achieve a quite competitive compression ratio.
- There is also a compression level which needs only 8 KB for Compression.
- Algorithm is thread safe.
- Algorithm is lossless.
- LZO supports overlapping compression and in-place decompression.

Files required for LZO algorithm.

- Include files, source files (src) provided by LZO - LZO.lib

Decompression steps:

1. Receive the packet in the temporary buffer i.e. array of characters.
2. First field will identify whether the packet is compressed or not.
3. If this field is 0 then Decompress it using LZO algorithm else if 1 don't decompress it and proceed in normal way as it is being done today.
4. The second field is packet length.
5. The third field contains the number of records in the packet.
6. If compressed use following function of LZO to Decompress.

```
r = lzo1z_decompress ((unsigned char *) cInputBuf, ipLength, (unsigned char*)
cOutputBuf, opLength, NULL);
```

lzo1z_decompress: Function which decompresses the data packet receive.
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

7. After decompression data will be available in Output Buffer.
8. Map the outputbuf to existing Header structure according to **iCode field available in header structure.**
9. Look for Record size in the length field and Code.
10. Steps to recover data from OutputBuf is as follows.

Algorithm:

```
Length_of_Record = Header->length;
Sequence_no = Header->Sequence_num;
For I = 0 to Number of records (obtained in step 4)
Begin
Bytes_to_seek = Length_of_Record * I
Seek to number of Bytes_to_seek
Map (Length_of_Record) of Bytes to proper structure according to iCode
as found in Header part.
Do the required processing….
….
End
End for Loop.
```

6 Checksum Calculation

Checksum is calculated for the Data part of the packet.
The **Checksum routine** followed for Info Vendor Feed is as follows:

```
  // Following are the macros 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);
}
```

7 Example: Function for Decompression.

```
lzo_decomp (char cInputBuf [], unsigned int ipLength, char cOutputBuf [],
            unsigned *opLength, unsigned short * lzo_errorcode)
{
     int r;
     char mess [50];
     r = lzo1z_decompress ((unsigned char *) cInputBuf, ipLength,
               (unsigned char *) cOutputBuf, opLength, NULL);

     if ( r == LZO_E_OK)
     {
           print (mess," Decompressed %lu Bytes back into %lu Bytes\n",
                  (long) ipLength, (long) *opLength);  return true;
     }
      else

      {

           OutputDebug ("Internal error - decompression failed");
          return false;
      }
}
```

8 Annexure-1

Distribution Schedule Category Detail

Category Id	Category Code	Master Class	Main Class	Sub Class
6	a)	Shareholding Pattern Details	Promoter & Promoter Group	
7	a)	Shareholding Pattern Details	Public	
8	a)	Shareholding Pattern Details	Non-Promoter-Non Public	
9	b)	Shareholding Pattern Details	Non-Promoter-Non Public	Shares underlying DRs
10	c)	Shareholding Pattern Details	Non-Promoter-Non Public	Shares held by Employee Trusts
11	a)	Shareholding of Promoter and Promoter Group	Indian	
12	(b)	Shareholding of Promoter and Promoter Group	Indian	Individuals/Hindu Undivided Family
13	(c)	Shareholding of Promoter and Promoter Group	Indian	Central Government/ State Government(s)
14	(d)	Shareholding of Promoter and Promoter Group	Indian	Financial Institutions/ Banks
15	(e)	Shareholding of Promoter and Promoter Group	Indian	Any Other(specify)
16	(f)	Shareholding of Promoter and Promoter Group	Indian	Sub-Total (A)(1)

17	(a)	Shareholding of Promoter and Promoter Group	Foreign	
18	(b)	Shareholding of Promoter and Promoter Group	Foreign	Individuals (Non-Resident Individuals/ Foreign Individuals)
19	(c)	Shareholding of Promoter and Promoter Group	Foreign	Government
20	(d)	Shareholding of Promoter and Promoter Group	Foreign	Institutions
21	(e)	Shareholding of Promoter and Promoter Group	Foreign	Foreign Portfolio Investor
22	(f)	Shareholding of Promoter and Promoter Group	Foreign	Any Other (specify)
23	(g)	Shareholding of Promoter and Promoter Group	Foreign	Sub-Total (A)(2)
24	(h)	Shareholding of Promoter and Promoter Group	Foreign	Total Shareholding of Promoter and Promoter Group (A)= (A)(1) +(A)(2)
25	(a)	Public shareholding	Institutions	
26	(b)	Public shareholding	Institutions	Mutual Funds
27	(c)	Public shareholding	Institutions	Venture Capital funds

28	(d)	Public shareholding	Institutions	Alternate Investment funds
29	(e)	Public shareholding	Institutions	Foreign Venture capital investors
30	(f)	Public shareholding	Institutions	Foreign Portfolio Investors
31	(g)	Public shareholding	Institutions	Financial Institutions/Banks
32	(h)	Public shareholding	Institutions	Insurance Companies
33	(i)	Public shareholding	Institutions	Provident Funds/Pension Funds
34	(j)	Public shareholding	Institutions	Any Other (specify)
35	(k)	Public shareholding	Institutions	Sub-Total (B)(1)
36	(a)	Public shareholding	Central Government/State Government(s) / president of india	Central Government/ State Government(s)/ president of India
37	b)	Public shareholding	Central Government/State Government(s) / president of india	Sub-Total (B)(2)

38	a)	Public shareholding	Non-institutions	
39	b)	Public shareholding	Non-institutions	Individuals
40	c)	Public shareholding	Non-institutions	Individual shareholders holding nominal share capital up to Rs.2 lakhs.
41	(d)	Public shareholding	Non-institutions	Individual shareholders holding nominal share capital in excess of Rs.2 lakhs.
42	(e)	Public shareholding	Non-institutions	NBFCs registered with RBI
43	(f)	Public shareholding	Non-institutions	Employee Trusts
44	(g)	Public shareholding	Non-institutions	Overseas Depositories (holding DRs) (balancing figure)
67	(h)	Public shareholding	Non-institutions	Any Other(specify)
45	(i)	Public shareholding	Non-institutions	Sub-Total (B)(3)
46	(j)	Public shareholding	Non-institutions	Total Public Shareholding (B)= (B)(1) +(B)(2) +(B)(3)
61	(a)	Non-Promoter-Non-Public Shareholder	Custodian/DR Holder	Name of DR Holder (if available)
63	(b)	Non-Promoter-Non-Public Shareholder	Employee Benefit Trust (under SEBI (share-based Employee Benefit)	Employee Benefit Trust (under SEBI (share-based Employee Benefit) regulations,2014

			regulations,2014)	
64	(c)	Non Promoter- Non-Public Shareholder	Total Non-Promoter- Non Public Shareholding (C)= (C)(1) +(C)(2)	Total Non-Promoter- Non Public Shareholding (C)= (C)(1) +(C)(2)

9 About SFTP (Secure File Transfer Protocol)

The file transfer takes place over SFTP (Secure FTP) protocol over the Internet.

The Info Vendor requires to provide the Exchange with the SSH RSA Public Key of their machine for receiving login details form the Exchange.

The following details will be provided once the request is processed by the Exchange:

- Server IP
- SSH Service Port
- User ID
- File Path

General information on SFTP has been provided in the following sections for popular OS platforms.

9.1 SFTP on Linux platform

The OpenSSH suite, which comes pre-installed in most Linux distributions, can be used for transferring files securely using SFTP.

The SSH key-pair is generally generated in the ".ssh" directory in the user's home directory.

It is highly recommended that you consult your systems administrator to generate/locate the key-pair and set up SFTP for you.

Continue reading for information on how to generate the key-pair.

9.1.1 Generation of the SSH RSA key-pair on Linux

- Generate the new key-pair with following command:

  ssh-keygen -t rsa -C "user@host"

- You will receive the following prompt:

  Generating public/private rsa key pair.
  "Enter file in which to save the key".

  Press the Enter to continue with the defaults.

- You will receive the following prompt:

  Enter file in which to save the key e key
  (/host/users/user/.ssh/id_rsa):

Press the Enter to continue with the defaults.

- If a file already exists with the same name, then you will receive the following prompt:

  /host/users/user/.ssh/id_rsa already exists.
  Overwrite (y/n)?

  Type "y" and press Enter to overwrite.

- You will be prompted to enter a passphrase as follows:

  Enter passphrase (empty for no passphrase):

  Press Enter to continue without a passphrase.

  You will be prompted to re-enter the passphrase:

  Enter same passphrase again:

  Press Enter again to continue without a passphrase.

- After you enter a passphrase, you will be presented with the "Fingerprint" (or ID) of your SSH key.

  It will look something like this:

  Your identification has been saved in /host/users/user/.ssh/id_rsa.
  Your public key has been saved in /host/users/user/.ssh/id_rsa.pub.
  The key fingerprint is:
  87:c4:85:90:91:16:39:de:c2:26:49:4a:b3:38:80:97 user@host

  After generating public key, user needs to share the Public Key file with exchange for requesting the credentials.

NOTE: In above steps the words "host" and "user" are used to represent the hostname and username of the machine. This is used for demo purpose only. The same will differ as per your server and usernames.

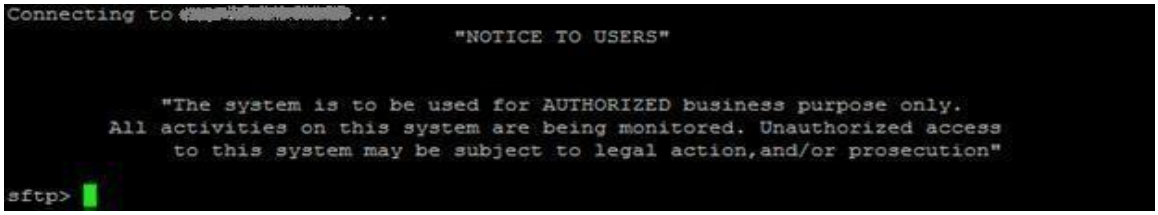
9.1.2 SFTP Login

Login to the Exchange Server over SFTP using the following command:

sftp -o PORT=6010 remote_user@remote_host

Where remote user is the User ID provided to you by the Exchange upon sharing your Public Key and remote host is the Exchange Server IP.

You should get the SFTP prompt as below, upon successful login:



9.1.3 Fetching files over SFTP

The SFTP "get" command may be used at the SFTP prompt for fetching the files while logged into the host over SFTP.

9.1.4 Ending the SFTP session

The SFTP "bye" command may be used for terminating the session.

9.1.5 SFTP commands help

Help may be obtained with SFTP commands by typing the "help" command at the SFTP prompt.

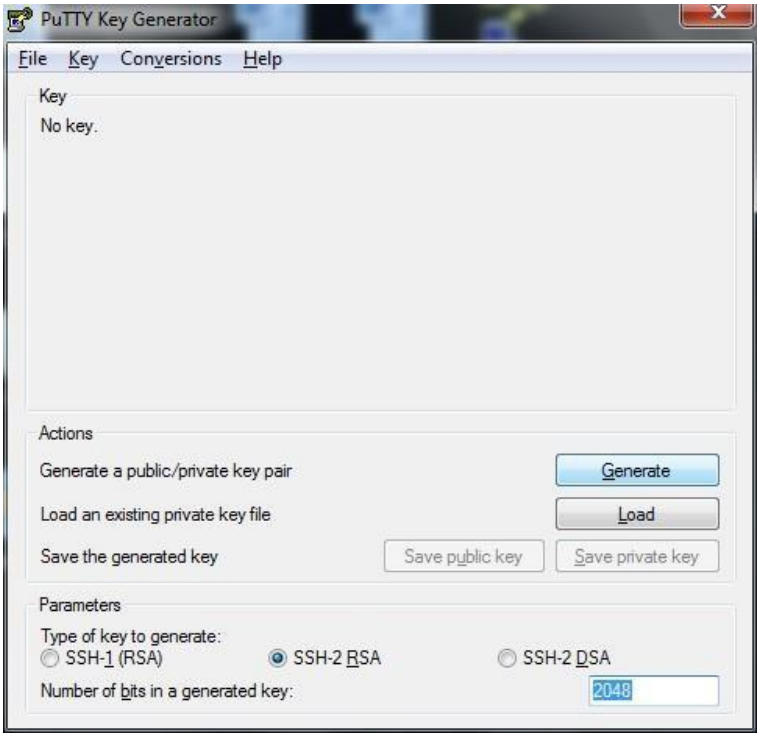
9.2 SFTP on Windows platform

9.2.1 Generation of the SSH RSA key-pair on Windows

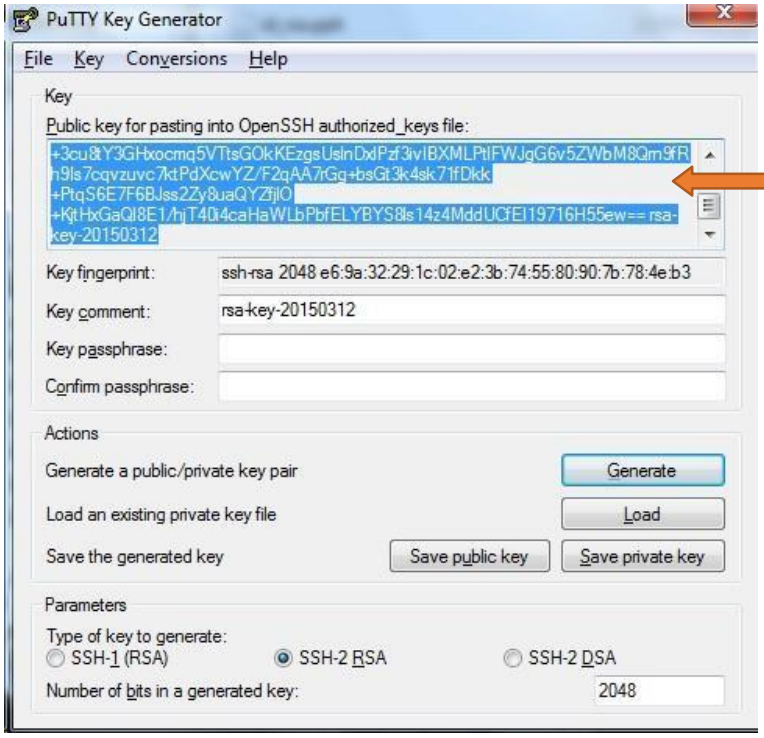
This guide explains how to generate the SSH RSA key-pair using the PuttyGen application.

Download the PuttyGen application (freely available on the Internet). Then follow these steps to generate the key-pair:

- Start the PuttyGen application.
  You will be presented with a dialog which looks something like this:



- Select "SSH2RSA" with 2048 bit size or greater.
- Press the "Generate" button.
- After generating the key, you will be shown the screen below. Keep the "Key passphrase" and "Confirm passphrase" as blank.



SSH RSA Public Key should be copied from here after generation

- Create a blank file with the name "id_rsa.pub".
  This will be the public key file which will be populated with your Public Key and shared with the Exchange.

- Copy the public key content as presented on the screen (selected area in the below screenshot) and paste into newly created public key file (id_rsa.pub) and save the file.

- Share this Public Key File (id_rsa.pub) with the Exchange when requesting for SFTP credentials.

9.2.2 SFTP Client Software on Windows

There are multiple SFTP Client Programs (paid for and free) available for transferring files over SFTP.

One such software is WinSCP, available for free from the WinSCP website. This program is intuitive, user friendly and can be used in interactive mode (GUI) as well as from the command line (for automation/batch processing).

Information on using WinSCP can be found on the WinSCP website.

9.3 Further support

Apart from the above guide, many of the online resources can be referred on the World Wide Web for more information on how to set up and use SFTP at the Client's site on various OS platforms.

Note:
This "About SFTP" section is intended as a guide used to understand and become familiarized with this transfer protocol. It may be noted that the Exchange does not provide SFTP software or support for configuring and using SFTP at Client site.

10 Notes

10.1 Field layout

- All the character (i.e. Byte) array fields are terminated with '\0'.

- All the structures fields are packed at a boundary of 1 byte. This can be done as shown below.

```
#pragma pack(1)
 typedef struct
{ short iCode
…
}ST_INFO_HEADER;
#pragma pack()
```

10.2 Byte Endianness

- If the client-side application is running on Big-endian type of a machine,then that client needs to send all the fields by reversing its byte order. For reversing the byte order following sample program can be used

  Sample code for reversing the byte order of any multi-byte data type field.

```
void Twiddle(char *buffer, int buffer_size)
{
     char *twiddle_buffer;
     int i;
     /*allocate the buffer for twiddling bytes */
      twiddle_buffer = (char* ) malloc(buffer_size);
     /* copy the buffer into a temporary buffer for
           twiddling.*/ memcpy(twiddle_buffer, buffer,
           buffer_size);
     /* reverse the bytes */
       for( i=0; i < buffer_size; i++)
     {
           buffer[i] = twiddle_buffer[buffer_size -i -
                 1];
     }
        /* free the buffer after twiddling */
       free(twiddle_buffer);
}
```

  e.g. The code field in Info header structure is 1000.
  Then its byte can be reversed by calling the above function as shown below

```
short iCode = 1000;
Twiddle((char*)&iCode , sizeof(short));
```

11 Support Information

Name	Email	Contact Number
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