

CORPORATE DATA

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Revision History

Name	Description	Date
Version 2.3	1. Removal of TCP/IP Session Initialization, Login Request, Login Response.	11 November 2022

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REAL TIME DATA TECHNICAL SPECIFICATION

CORPORATE DATA

1. INTRODUCTION

NSE Data & Analytics Ltd. disseminates NSEIL's real time broadcast data to various information agencies. It provides the 3 different types of data to vendors, i.e. Real Time Data, Snapshot Data and End of Day Data. The real time data is a packet broadcast available in multicast format, whereas the snapshot data and End of day data is available in the form of files. The Infofeed server provides NSEIL real time broadcast data. The information agencies connect to the Infofeed Server through 2 Mbps Leased Lines. These leased lines are terminated on Infofeed Router and their data specific pneumatic calls are forwarded to Infofeed server. The Infofeed server accepts these pneumatic calls and creates a socket connection. The multicast data flows to the information agencies through these socket connections.

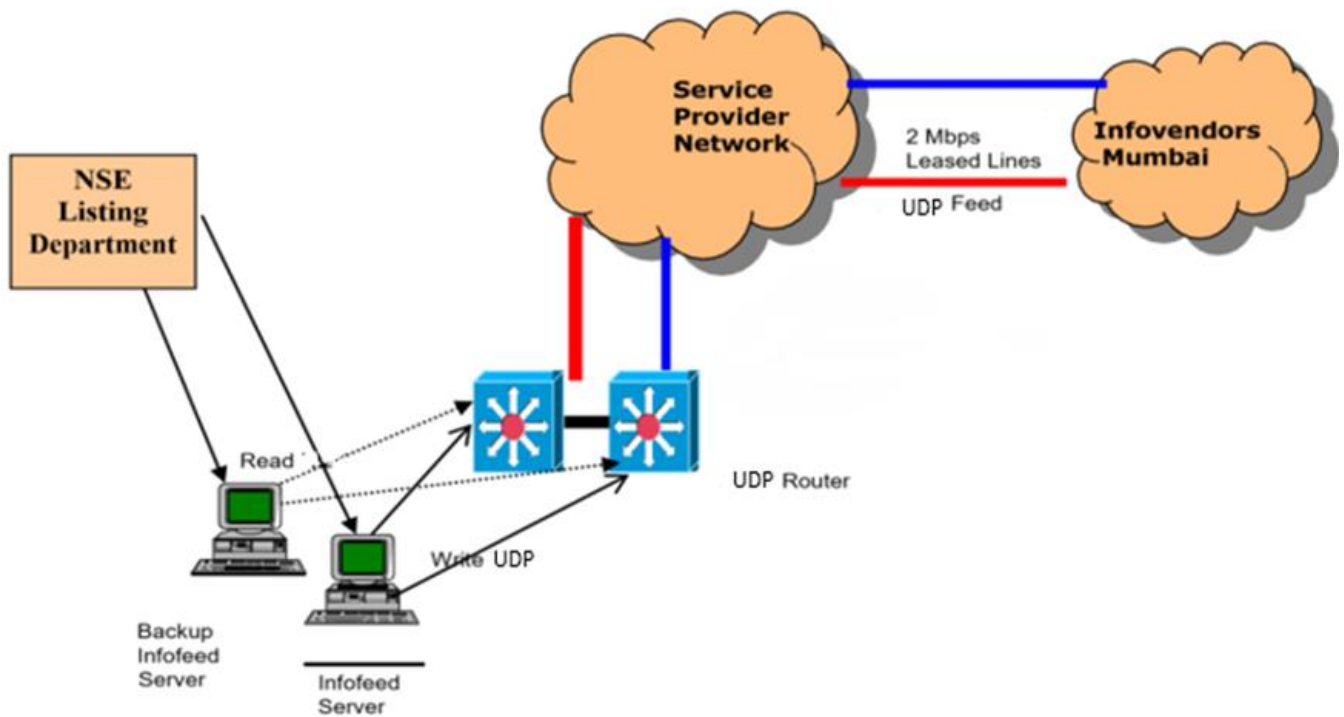
In real time Corporate Data product following information will be disseminates by Infofeed server.

1. Corporate Announcements – (Online)
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

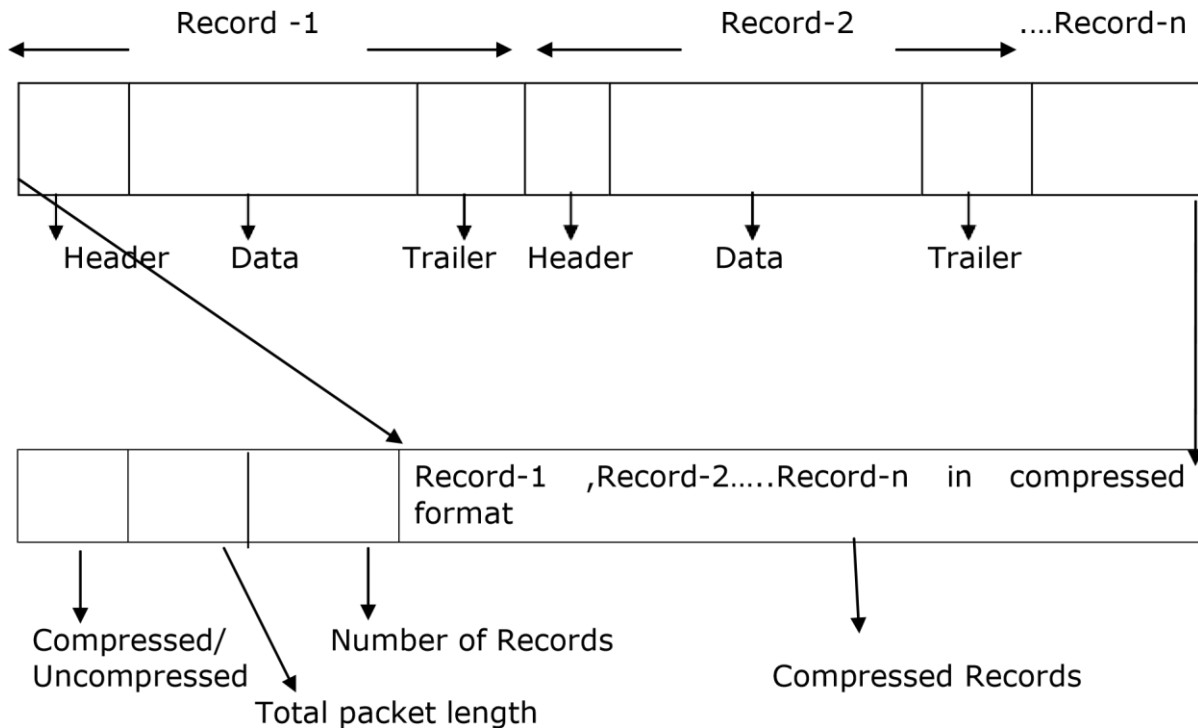
2. CONNECTION DETAILS

2.1 STRUCTURAL DIAGRAM

The structural diagram of Real Time data connection has been explained below



2.2 PACKET FORMAT



Compressed/Uncompressed:

This field tells whether packet is compressed or not compressed.

If this Field = 0 then Compressed.

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 cCmpOrNot; short
  iPackLen; short
  iNoOfPack;
};
  
```


- g) As the data packets are sent in compressed format there is a need to decompress them. The compression algorithm used is LZ0.
- h) The Decompression algorithm used should be LZ0



2.3 STEPS FOR DECOMPRESSING FEED

- LZO Algorithm Details:
- LZO is a data compression library which is suitable for data de-/compression in real-time. This means it favours speed over compression ratio.
- LZO is written in ANSI C. Both the source code and the compressed data format are designed to be portable across platforms.

LZO implements a number of algorithms with the following feature

- Decompression is simple and *very* fast.
- Requires no memory for decompression.
- Compression is pretty 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

For more information on LZO library and downloads visit:

http://www.nseindia.com/content/press/prs_whatsnew.htm#2

Specifications for utilizing on-line broadcast information **Decompression**

steps:

- Receive the packet in the temporary buffer i.e. array of characters.
- First field will identify whether the packet is compressed or not.
- 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.
- The second field is packet length.
- The third field contains the number of records in the packet. □ 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

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

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.



3. DATA DETAILS

The real time data is disseminated in the form of multicast packets and each single packet generated by Infofeed system 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.

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, infofeed server will send the heartbeat signal. Heartbeat sequence number is also maintained separately.

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

TRAILER

Trailer contains a 2-byte checksum and an end of trailer character.
Checksum is calculated using the algorithm given in point no 6.
End of trailer character is '\r'

4. DATA STRUCTURE DETAILS

4.1 CORPORATE ANNOUNCEMENT

Corporate Announcement packet will be sent by the Infofeed server application as and when any announcement is published by NSE.

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or Not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	CA Sequence number
DATA		
Symbol	CHAR (11 Bytes)	Security Symbol
CA Description	CHAR (65 Bytes)	Brief Description about announcements or financial result update
CA Details	CHAR (2048 Bytes)	Details about the announcement
CA Date	CHAR (13 Bytes)	Announcement date

CA Attachment File Name	CHAR (100 Bytes)	Attachment File Name*
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6
End Of Trailer	CHAR (1 Byte)	'\r'

**Corresponding Attachment file shall be available over SFTP. Please refer section 9 for information on SFTP Protocol.*

4.2 COMPANY RESULT

4.2.1 COMPANY FINANCIAL RESULT

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

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	CR Sequence number
DATA		

Result Sequence Number	Long (4 Bytes)	This result record sequence no is referred in 'Segment Wise Result' packet structure
Symbol	CHAR (11 bytes)	Security Symbol
Category	CHAR (1 byte)	B-Banking and N-Nonbanking, A-Alternative
From Date	CHAR (11 bytes)	YYYY-MM-DD. Result Period From
To Date	CHAR (11 bytes)	YYYY-MM-DD. Result Period To
Result Type	CHAR (3 bytes)	Audited (A), Unaudited(U), Project Status Report
Period Type	CHAR (3 bytes)	Quarter 1= Q1, Quarter 2= Q2, Quarter 3= Q3, Quarter 4= Q4, Half Yearly =H1, Annual (AN), Others (OT)
Cumulative Noncumulative	CHAR (1 byte)	C, N
Consolidated Non Consolidated	CHAR (1 byte)	C, N
Net Sales Income	Double (8 bytes)	Net Sales Income
Other Income	Double (8 bytes)	Other Income
Total Income1	Double (8 bytes)	Total Income1
Increase in Stock in Trade	Double (8 bytes)	Increase in Stock in Trade



Consumption of raw materials	Double (8 bytes)	Consumption of raw materials
Employee Cost	Double (8 bytes)	
Total Expenditure1	Double (8 bytes)	excluding other exp
Other Expenditure	Double (8 bytes)	
Total Expenditure2	Double (8 bytes)	
Interest	Double (8 bytes)	
PBDT	Double (8 bytes)	Gross profit after interest
Depreciation	Double (8 bytes)	Depreciation
Profit (+)/Loss (-) from Ordinary Activities before Tax	Double (8 bytes)	Profit (+)/Loss (-) from Ordinary Activities before Tax
Tax Expenses	Double (8 bytes)	Tax Expenses
Other Provision	Double (8 bytes)	Other Provision
Misc. expenditure w/o	Double (8 bytes)	Misc. expenditure w/o
Net Profit (+)/Loss (-) For the Period	Double (8 bytes)	Net Profit (+)/Loss (-) For the Period
Non-Rec Income	Double (8 bytes)	Non-Rec Income
Non-Rec Expenses	Double (8 bytes)	Non-Rec Expenses
Adjusted net profit	Double (8 bytes)	Adjusted net profit
Face value of share (In Rs.)	Double (8 bytes)	Face value of share (In Rs.)
Paid-up equity share capital	Double (8 bytes)	Paid-up equity share capital
Reserves excluding revaluation reserves	Double (8 bytes)	Reserves excluding revaluation reserves
Dividend (%)	Float (4 Bytes)	Dividend (%)

Basic EPS after Extraordinary Items (In Rs.)	Double (8 bytes)	Basic EPS after Extraordinary Items (In Rs.)
Diluted EPS after Extraordinary Items (In Rs.)	Double (8 bytes)	Diluted EPS after Extraordinary Items (In Rs.)
Non-promoter shareholding (Nos.)	Double (8 bytes)	Non-promoter shareholding (Nos.)

Non-promoter shareholding (%)	Float (4 Bytes)	Non-promoter shareholding (%)
Public shareholding (Nos.)	Double (8 bytes)	Public shareholding (Nos.)
Public shareholding (%)	Float (4 Bytes)	Public shareholding (%)
Interest/discount on advances/bills	Double (8 bytes)	Interest/discount on advances/bills
Income on Investments	Double (8 bytes)	Income on Investments
balances with RBI and other interbank funds	Double (8 bytes)	balances with RBI and other interbank funds
Others	Double (8 bytes)	Others
Interest Earned	Double (8 bytes)	Interest Earned
Total Income ²	Double (8 bytes)	Total Income ²
Interest Expended	Double (8 bytes)	Interest Expended
Payment to and provisions for employees	Double (8 bytes)	Payment to and provisions for employees
Other operating expenses	Double (8 bytes)	Other operating expenses
Operating Expenses	Double (8 bytes)	Operating Expenses



Total Expenditures excluding Provisions & Contingencies	Double (8 bytes)	Total Expenditures excluding Provisions & Contingencies
Operating Profit before Provisions & Contingencies	Double (8 bytes)	Operating Profit before Provisions & Contingencies
Provisions (Other than Tax) & Contingencies	Double (8 bytes)	Provisions (Other than Tax) & Contingencies
Shares held by Government of India (%)	Float (4 Bytes)	Shares held by Government of India (%)
Capital Adequacy Ratio	Double (8 bytes)	Capital Adequacy Ratio
Gross Profit	Double (8 bytes)	0 If Result Is Banking Or Non-Banking)
Operating Profit before interest and depreciation	Double (8 bytes)	0 If Result Is Banking Or Non-Banking
General Administrative Expenses	Double (8 bytes)	0 If Result Is Banking Or Non-Banking
Sell distribution	Double (8 bytes)	0 If Result Is Banking Or Non-Banking
Operating Profit after interest and depreciation	Double (8 bytes)	0 If Result Is Banking Or Non-Banking)
FRF Flag	CHAR (1 byte)	V-Revision, F-Refilling, G-Regrouping, N- None (No Change)
FRF Link	INT (4 bytes)	



Result Create Date	CHAR (21 bytes)	For Revision/Refilling/Re grouping "On Date" Format (DD-MON-YYYY HH24:MI: SS)
Purchase of Traded Goods	Double (8 bytes)	Purchase of Traded Goods
Depreciation	Double (8 bytes)	Depreciation
Exceptional Items	Double (8 bytes)	Exceptional Items
Net Profit (+)/Loss (-) From ordinary Activities after Tax	Double (8 bytes)	Net Profit (+)/Loss (-) From ordinary Activities after Tax
Extraordinary Items	Double (8 bytes)	Extraordinary Items
Minority Interest	Double (8 bytes)	Minority Interest
Share of Associates	Double (8 bytes)	Share of Associates
Other related Items (Consolidated)	Double (8 bytes)	Other related Items (Consolidated)
Consolidated Net Profit (+)/Loss (-) for the Period	Double (8 bytes)	Consolidated Net Profit (+)/Loss (-) for the Period
Basic EPS before Extraordinary Items (In Rs.)	Double (8 bytes)	Basic EPS before Extraordinary Items (In Rs.)
Diluted EPS before Extraordinary Items	Double (8 bytes)	Diluted EPS before Extraordinary Items
Gross/Net NPA	Double (8 bytes)	Gross/Net NPA
Percentage Gross/Net NPA	Float (4 Bytes)	Percentage Gross/Net NPA
Return on Assets	Double (8 bytes)	Return on Assets
Operating Profit before Interest	Double (8 bytes)	Operating Profit before Interest
Operating Profit after Interest and Exceptional Items	Double (8 bytes)	Operating Profit after Interest and Exceptional Items

Other Operating Income	Double (8 bytes)	Other Operating Income
Profits from operations before Other Income, Interest & Exceptional Items	Double (8 bytes)	Profits from operations before Other Income, Interest & Exceptional Items
Other Income 2	Double (8 bytes)	Other Income
Profit before Interest & Exceptional Items	Double (8 bytes)	Profit before Interest & Exceptional Items
Interest 2	Double (8 bytes)	Interest
Profit after Interest but before Exceptional Items	Double (8 bytes)	Profit after Interest but before Exceptional Items
Exceptional Items 2	Double (8 bytes)	Exceptional Items
Result Remarks	CHAR (2001 bytes)	Result Remarks
Segment Information Remarks	CHAR (2001 bytes)	Segment Information Remarks
Date Time stamp	CHAR (15 bytes)	DDMMYYYYHHMMSS format
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer Point no 6
End Of Trailer	CHAR (1 Byte)	'\r'



4.2.2 SEGMENT WISE RESULT

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

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	CA Sequence number
DATA		
Company Result reference sequence Number	Long (4 Bytes)	Reference to the 'Company Result' record sequence number
Segment Type	CHAR (3 Bytes)	CE=Capital Employed RE=Results and RV=Revenue
Primary Segment Name	CHAR (51 bytes)	Primary Segment Name
Secondary Segment Name	CHAR (51 bytes)	Secondary Segment Name
Segment Value	Double (8 bytes)	Segment Value



Field to be added or subtracted	CHAR (1 byte)	A-Added, S-Subtracted
Date Time stamp	CHAR (15 bytes)	DDMMYYYYHHMMS S format
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6
End Of Trailer	CHAR (1 Byte)	'\r'

4.3 DISTRIBUTION SCHEDULE

4.3.1 SHAREHOLDING PATTERN DECLARATION

Shareholding Pattern Declaration packet structure comes under the Distribution Schedule.

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not s	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	DS Sequence number
DATA		
Symbol	CHAR (11 bytes)	Security symbol

Series	CHAR (3 bytes)	Series type (e.g. EQ)
Security Name	CHAR (151 bytes)	Security Name
Company Name	CHAR (151 bytes)	Company Name
As On Date	CHAR (12 bytes)	Distribution Schedule provided is recorded on this date. Date in DD-MMM-YYYY format
Sr. No.	CHAR (6 bytes)	Shareholder category code
Particulars	CHAR (101 bytes)	Shareholder category description
Promotor & Promotor Group	CHAR (11 bytes)	Shareholder category type
Public	CHAR (4 bytes)	Shareholder category type
Non-Promotor Non Public	CHAR (4 bytes)	Shareholder category type
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6.
End Of Trailer	CHAR (1 Byte)	'\r'

4.3.2 SHAREHOLDING PATTERN DETAILS

Shareholding Pattern details packet structure comes under the Distribution Schedule. This packet will be sent by the Infofeed server as End Of Day Feed

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed

Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	DS Sequence number
DATA		
Symbol	CHAR (11 bytes)	Security symbol
Series	CHAR (3 bytes)	Series type (e.g. EQ)
Security Name	CHAR (151 bytes)	Security Name
Company Name	CHAR (151 bytes)	Company Name
As On Date	CHAR (12 bytes)	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format
Category	CHAR (51 bytes)	Shareholder category code
Category of shareholder	CHAR (101 bytes)	Shareholder category description
Nos. of shareholders	Integer (8 bytes)	Nos. of shareholders
No. of fully paid-up equity shares held	Integer (8 bytes)	No. of fully paid-up equity shares held
No. of Partly paid-up equity shares held	Integer (8 bytes)	No. of Partly paid- up equity shares held



No. of shares underlying Depository Receipts	Integer (8 bytes)	No. of shares underlying Depository Receipts
Total nos. shares held	Integer (8 bytes)	Total nos. shares held
Shareholding as a % of total no. of shares (Calculated as per SCRR, 1957) As a % of (A+B+C2)	Double (8 bytes)	Total Share held percentage
Number of Voting Rights held in each class of securities Class e.g.: X	Integer (8 bytes)	Number of Voting Rights held in each class of securities Class e.g.: X
Number of Voting Rights held in each class of securities Class e.g.: Y	Integer (8 bytes)	Number of Voting Rights held in each class of securities Class e.g.: Y
Number of Voting Rights held in each class of securities: total	Integer (8 bytes)	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 (8 bytes)	Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)
No. of Shares Underlying Outstanding convertible securities (including Warrants)	Integer (8 bytes)	No. of Shares Underlying Outstanding convertible securities (including Warrants)
Shareholding, as a % assuming full conversion of convertible securities (as a	Double (8 bytes)	Shareholding, as a % assuming full conversion of convertible securities (as a



percentage of diluted share capital) As a % of (A+B+C2)		percentage of diluted share capital) As a % of (A+B+C2)
Number of Locked in shares	Integer (8 bytes)	Number of Locked in shares
Number of Locked in shares as a % of total Shares held	Double (8 bytes)	Number of Locked in shares as a % of total Shares held
Number of Shares pledged or otherwise encumbered	Integer (8 bytes)	Number of Shares pledged or otherwise encumbered
Number of Shares pledged or otherwise encumbered as a % of total Shares held	Double (8 bytes)	Number of Shares pledged or otherwise encumbered as a % of total Shares held
Number of equity shares held in dematerialized form	Integer (8 bytes)	Number of equity shares held in dematerialized form
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6
End Of Trailer	CHAR (1 Byte)	'\r'

4.3.3 PROMOTERS SHAREHOLDING DETAILS

Promoters Shareholding details packet structure comes under the Distribution Schedule. This packet will be sent by the Infofeed server as End Of Day Feed

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not sss	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed

Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	DS Sequence number
DATA		
Symbol	CHAR (11 bytes)	Security symbol
Series	CHAR (3 bytes)	Series type (e.g. EQ)
Security Name	CHAR (151 bytes)	Security Name
Company Name	CHAR (151 bytes)	Company Name
As On Date	CHAR (12 bytes)	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format
Category	CHAR (51 bytes)	Shareholder category code
PAN	CHAR (11 bytes)	PAN no of shareholder
Category of shareholder	CHAR (101 bytes)	Shareholder category description
Nos. of shareholders	Integer (8 bytes)	Nos. of shareholders
No. of fully paid-up equity shares held	Integer (8 bytes)	No. of fully paid-up equity shares held
No. of Partly paid-up equity shares held	Integer (8 bytes)	No. of Partly paid- up equity shares held



No. of shares underlying Depository Receipts	Integer (8 bytes)	No. of shares underlying Depository Receipts
Total nos. shares held	Integer (8 bytes)	Total nos. shares held
Shareholding as a % of total no. of shares (Calculated as per SCRR, 1957) As a % of (A+B+C2)	Double (8 bytes)	Total Share held percentage
Number of Voting Rights held in each class of securities Class e.g.: X	Integer (8 bytes)	Number of Voting Rights held in each class of securities Class e.g.: X
Number of Voting Rights held in each class of securities Class e.g.: Y	Integer (8 bytes)	Number of Voting Rights held in each class of securities Class e.g.: Y
Number of Voting Rights held in each class of securities: total	Integer (8 bytes)	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 (8 bytes)	Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)
No. of Shares Underlying Outstanding convertible securities (including Warrants)	Integer (8 bytes)	No. of Shares Underlying Outstanding convertible securities (including Warrants)
Shareholding, as a % assuming full conversion of convertible securities (as a percentage of	Double (8 bytes)	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	Integer (8 bytes)	Number of Locked in shares
Number of Locked in shares as a % of total Shares held	Double (8 bytes)	Number of Locked in shares as a % of total Shares held
Number of Shares pledged or otherwise encumbered	Integer (8 bytes)	Number of Shares pledged or otherwise encumbered
Number of Shares pledged or otherwise encumbered as a % of total Shares held	Double (8 bytes)	Number of Shares pledged or otherwise encumbered as a % of total Shares held
Number of equity shares held in dematerialized form	Integer (8 bytes)	Number of equity shares held in dematerialized form
Parent ID	Integer (8 bytes)	Unique parent ID which is used for mapping and aggregation.
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6
End Of Trailer	CHAR (1 Byte)	'\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 Infofeed server as End Of Day Feed.

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not	CHAR (1 byte)	0 = Compressed,

		1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	DS Sequence number
DATA		
Symbol	CHAR (11 bytes)	Security symbol
Series	CHAR (3 bytes)	Series type (e.g. EQ)
Security Name	CHAR (151 bytes)	Security Name
Company Name	CHAR (151 bytes)	Company Name
As On Date	CHAR (12 bytes)	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format
Category	CHAR (51 bytes)	Shareholder category code
PAN	CHAR (11 bytes)	PAN no of shareholder
Category of shareholder	CHAR (101 bytes)	Shareholder category description
Nos. of shareholders	Integer (8 bytes)	Nos. of shareholders



No. of fully paid-up equity shares held	Integer (8 bytes)	No. of fully paid-up equity shares held
No. of Partly paid-up equity shares held	Integer (8 bytes)	No. of Partly paid-up equity shares held
No. of shares underlying Depository Receipts	Integer (8 bytes)	No. of shares underlying Depository Receipts
Total nos. shares held	Integer (8 bytes)	Total nos. shares held
Shareholding as a % of total no. of shares (Calculated as per SCRR, 1957) As a % of (A+B+C2)	Double (8 bytes)	Total Share held percentage
Number of Voting Rights held in each class of securities Class e.g.: X	Integer (8 bytes)	Number of Voting Rights held in each class of securities Class e.g.: X
Number of Voting Rights held in each class of securities Class e.g.: Y	Integer (8 bytes)	Number of Voting Rights held in each class of securities Class e.g.: Y
Number of Voting Rights held in each class of securities: total	Integer (8 bytes)	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 (8 bytes)	Number of Voting Rights held in each class of securities: Total as a % of (A+B+C)
No. of Shares Underlying Outstanding	Integer (8 bytes)	No. of Shares Underlying Outstanding convertible



convertible securities (including Warrants)		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 (8 bytes)	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	Integer (8 bytes)	Number of Locked in shares
Number of Locked in shares as a % of total Shares held	Double (8 bytes)	Number of Locked in shares as a % of total Shares held
Number of Shares pledged or otherwise encumbered	Integer (8 bytes)	Number of Shares pledged or otherwise encumbered
Number of Shares pledged or otherwise encumbered as a %	Double (8 bytes)	Number of Shares pledged or otherwise encumbered as a
of total Shares held		% Of total Shares held
Number of equity shares held in dematerialized form	Integer (8 bytes)	Number of equity shares held in dematerialized form
Parent ID	Integer (8 bytes)	Unique parent ID which is used for mapping and aggregation.
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer Point no 6



End Of Trailer	CHAR (1 Byte)	'\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 Infofeed server as End of Day Feed.

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	DS Sequence number
DATA		
Symbol	CHAR (11 bytes)	Security symbol
Series	CHAR (3 bytes)	Series type (e.g. EQ)

Security Name	CHAR (151 bytes)	Security Name
Company Name	CHAR (151 bytes)	Company Name
As On Date	CHAR (12 bytes)	Distribution Schedule provided is recorded on this date. Date in DD- MMM- YYYY format
Category	CHAR (51 bytes)	Shareholder category code
PAN	CHAR (11 bytes)	PAN no of shareholder
Category of shareholder	CHAR (101 bytes)	Shareholder category description
Nos. of shareholders	Integer (8 bytes)	Nos. of shareholders
No. of fully paid-up equity shares held	Integer (8 bytes)	No. of fully paid-up equity shares held
No. of Partly paid-up equity shares held	Integer (8 bytes)	No. of Partly paid-up equity shares held
No. of shares underlying Depository Receipts	Integer (8 bytes)	No. of shares underlying Depository Receipts
Total nos. shares held	Integer (8 bytes)	Total nos. shares held
Shareholding as a % of total no. of shares (Calculated as per SCRR, 1957) As a % of (A+B+C2)	Double (8 bytes)	Total Share held percentage
Number of Voting Rights held in each class of securities Class e.g.: X	Integer (8 bytes)	Number of Voting Rights held in each class of securities Class e.g.: X



Number of Voting Rights held in each class of securities Class e.g.: Y	Integer (8 bytes)	Number of Voting Rights held in each class of securities Class e.g.: Y
Number of Voting Rights held in each class of securities: total	Integer (8 bytes)	Number of Voting Rights held in each class of securities: total
Number of Voting Rights held in each class of securities:	Double (8 bytes)	Number of Voting Rights held in each class of securities:
Total as a % of (A+B+C)		Total as a % of (A+B+C)
No. of Shares Underlying Outstanding convertible securities (including Warrants)	Integer (8 bytes)	No. 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 (8 bytes)	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	Integer (8 bytes)	Number of Locked in shares
Number of Locked in shares as a % of total Shares held	Double (8 bytes)	Number of Locked in shares as a % of total Shares held
Number of Shares pledged or otherwise encumbered	Integer (8 bytes)	Number of Shares pledged or otherwise encumbered
Number of Shares pledged or	Double (8 bytes)	Number of Shares pledged or



otherwise encumbered as a % of total Shares held		otherwise encumbered as a % of total Shares held
Number of equity shares held in dematerialized form	Integer (8 bytes)	Number of equity shares held in dematerialized form
Parent ID	Integer (8 bytes)	Unique parent ID which is used for mapping and aggregation.
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6.
End Of Trailer	CHAR (1 Byte)	'\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 Infofeed server as End of Day Feed

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed



Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	DS Sequence number
DATA		
Symbol	CHAR (11 bytes)	Security symbol
Series	CHAR (3 bytes)	Series type (e.g. EQ)
Security Name	CHAR (151 bytes)	Security Name
Company Name	CHAR (151 bytes)	Company Name
As On Date	CHAR (12 bytes)	Distribution Schedule provided is recorded on this date. Date in DD-MMM- YYYY format
No. of shareholders	Integer (8 bytes)	No. of shareholders
No of Shares held	Integer (8 bytes)	No of Shares held
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6.
End Of Trailer	CHAR (1 Byte)	'\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 Infofeed server as End Of Day Feed

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or Not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	DS Sequence number
DATA		
Symbol	CHAR (11 bytes)	Security symbol
Series	CHAR (3 bytes)	Series type (e.g. EQ)
Security Name	CHAR (151 bytes)	Security Name
Company Name	CHAR (151 bytes)	Company Name



As On Date	CHAR (12 bytes)	Distribution Schedule provided is recorded on this date. Date in DD-MMM-YYYY format
Name of shareholder	CHAR (301 bytes)	Name of shareholder
Name of PAC	CHAR (301 bytes)	Name of PAC
No. of shareholders	Integer (8 bytes)	No. of shareholders
Holding %	Double (8 bytes)	Holding %
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6
End Of Trailer	CHAR (1 Byte)	'\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 Infofeed server as End of Day Feed

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or Not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer))
No of Packets	Short Integer (2 Bytes)	No of records

INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	DS Sequence number
DATA		
Symbol	CHAR (11 bytes)	Security symbol
Series	CHAR (3 bytes)	Series type (e.g. EQ)
Security Name	CHAR (151 bytes)	Security Name
Company Name	CHAR (151 bytes)	Company Name
As On Date	CHAR (12 bytes)	Distribution Schedule provided is recorded on this date. Date in DD- MMM-YYYY format
No. of shareholders	Integer (8 bytes)	No. of shareholders
No of Shares held	Integer (8 bytes)	No of Shares
		held
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6
End Of Trailer	CHAR (1 Byte)	'\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	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		
Compressed or not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	Always 0
DATA		
Not associated with any data.		
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6
End Of Trailer	CHAR (1 Byte)	'\r'

4.5 HEARTBEAT SIGNAL

The Heartbeat packets are sent throughout the day from 07:30 a.m. to 10:30 p.m. This packet indicates to the Info-Vendors that data packets are received from the Infofeed server.

A separate sequence number will be maintained for Heartbeat signal

FIELD	DATA TYPE / LENGTH	DESCRIPTION
COM HEADER		



Compressed or Not	CHAR (1 byte)	0 = Compressed, 1 = Uncompressed
Packet Length	Short Integer (2 Bytes)	No of Packets *Size of (Info Header+ Data+ Info Trailer)
No of Packets	Short Integer (2 Bytes)	No of records
INFO HEADER		
Length	Short Integer (2 Bytes)	Sizeof (Info Header +Data + Info Trailer)
Sequence Number	Long (4 Bytes)	Heartbeat packet sequence no
DATA		
Not associated with any ASCII data.		
INFO TRAILER		
Check Sum	Short Integer (2 Bytes)	Refer point no 6
End Of Trailer	CHAR (1 Byte)	'\r'



5 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 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 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;
  }
}
```

7 ANNEXURE-1

Distribution Schedule Category Detail

CATEGORY ID	CATEGORY MASTER 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 ³	Indian	
12	(b)	Shareholding of Promoter and Promoter Group ³	Indian	Individuals/Hindu Undivided Family
13	(c)	Shareholding of Promoter and Promoter Group ³	Indian	Central Government/ State Government(s)
14	(d)	Shareholding of Promoter and Promoter Group ³	Indian	Financial Institutions/ Banks
15	(e)	Shareholding of Promoter and Promoter Group ³	Indian	Any Other(specify)

16	(f)	Shareholding of Promoter and Promoter Group ³	Indian	Sub-Total (A)(1)
17	(a)	Shareholding of Promoter and Promoter Group ³	Foreign	
18	(b)	Shareholding of Promoter and Promoter Group ³	Foreign	Individuals (Non- Resident Individuals/ Foreign Individuals)
19	(c)	Shareholding of Promoter and Promoter Group ³	Foreign	Government
20	(d)	Shareholding of Promoter and Promoter Group ³	Foreign	Institutions
21	(e)	Shareholding of Promoter and Promoter Group ³	Foreign	Foreign Portfolio Investor
22	(f)	Shareholding of Promoter and Promoter Group ³	Foreign	Any Other (specify)
23	(g)	Shareholding of Promoter and Promoter Group ³	Foreign	Sub-Total (A)(2)
24	(h)	Shareholding of Promoter and Promoter Group ³	Foreign	Total Shareholding of Promoter and Promoter Group (A)= (A)(1) +(A)(2)
25	(a)	Public shareholding ⁴	Institutions	
26	(b)	Public shareholding ⁴	Institutions	Mutual Funds



27	(c)	Public shareholding ⁴	Institutions	Venture Capital funds
28	(d)	Public shareholding ⁴	Institutions	Alternate Investment funds
29	(e)	Public shareholding ⁴	Institutions	Foreign Venture capital investors
30	(f)	Public shareholding ⁴	Institutions	Foreign Portfolio Investors
31	(g)	Public shareholding ⁴	Institutions	Financial Institutions/Banks
32	(h)	Public shareholding ⁴	Institutions	Insurance Companies
33	(i)	Public shareholding ⁴	Institutions	Provident Funds/Pension Funds
34	(j)	Public shareholding ⁴	Institutions	Any Other (specify)
35	(k)	Public shareholding ⁴	Institutions	Sub-Total (B)(1)
36	(a)	Public shareholding ⁴	Central Government/State Government(s)/ president of India	Central Government/ State Government(s)/ president of India
37	b)	Public shareholding ⁴	Central Government/State Government(s)/ president of India	Sub-Total (B)(2)



38	a)	Public shareholding ⁴	Non-institutions	
39	b)	Public shareholding ⁴	Non-institutions	Individuals
40	c)	Public shareholding ⁴	Non-institutions	Individual shareholders holding nominal share capital up to Rs.2 lakhs.
41	(d)	Public shareholding ⁴	Non-institutions	Individual shareholders holding nominal share capital in excess of Rs.2 lakhs.
42	(e)	Public shareholding ⁴	Non-institutions	NBFCs registered with RBI
43	(f)	Public shareholding ⁴	Non-institutions	Employee Trusts
44	(g)	Public shareholding ⁴	Non-institutions	Overseas Depositories (holding DRs) (balancing figure)
67	(h)	Public shareholding ⁴	Non-institutions	Any Other(specify)
45	(i)	Public shareholding ⁴	Non-institutions	Sub-Total (B)(3)
46	(j)	Public shareholding ⁴	Non-institutions	Total Public Shareholding (B)= (B)(1) +(B)(2) +(B)(3)
61	(a)	Non Promoter-Non-Public Shareholder ⁵	Custodian/DR Holder	Name of DR Holder (if available)

63	(b)	Non-Promoter-Non-Public Shareholder ⁵	Employee Benefit Trust (under SEBI (share-based Employee Benefit) regulations,2014)	Employee Benefit Trust (under SEBI (share-based Employee Benefit) regulations,2014)
64	(c)	Non Promoter-Non-Public Shareholder ⁵	Total Non-Promoter- Non Public Shareholding (C)= (C)(1) +(C)(2)	Total Non-Promoter- Non Public Shareholding (C)= (C)(1) +(C)(2)



8 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.

8.1 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.

8.1.1 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
(/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.

Your 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 host name and username of the machine. This is used for demo purpose only. The same will differ as per your server and usernames.

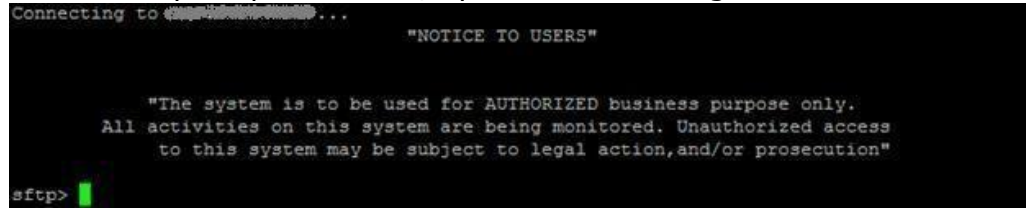
8.1.2 SFTP Login

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:



```
Connecting to [redacted]...  
"NOTICE TO USERS"  
  
"The system is to be used for AUTHORIZED business purpose only.  
All activities on this system are being monitored. Unauthorized access  
to this system may be subject to legal action, and/or prosecution"  
  
sftp>
```

8.1.3 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.

8.1.4 Ending the SFTP session

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

8.1.5 SFTP commands help

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

8.2 SFTP on Windows platform

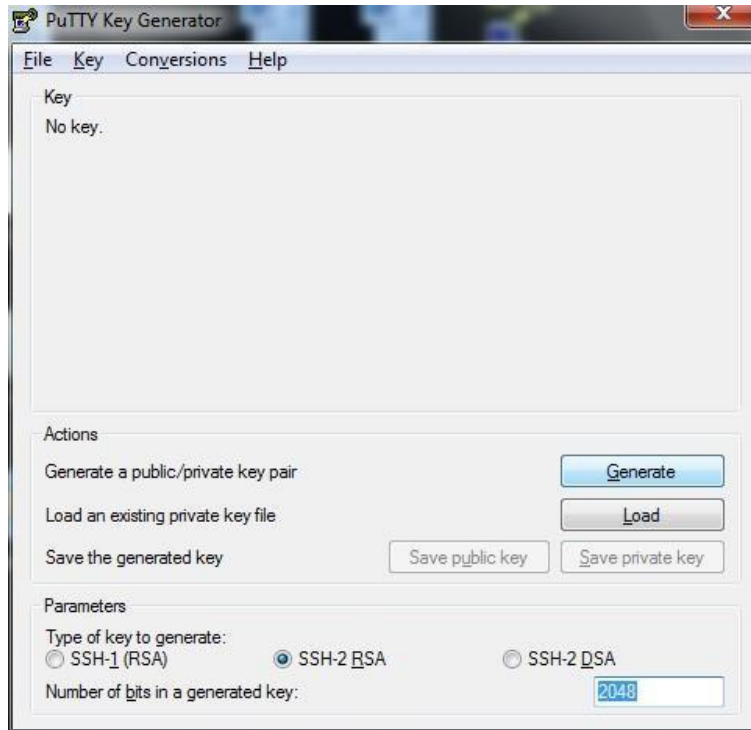
8.2.1 Generation of the SSH RSA key-pair on Windows

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:

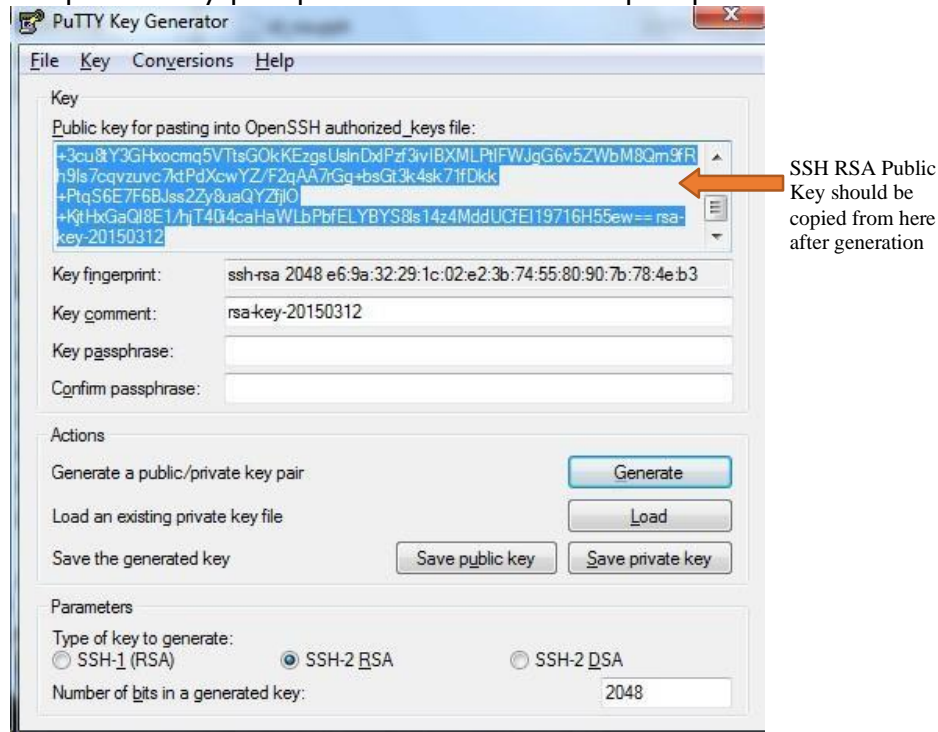
- Start the PuttyGen application.
You will be presented with a dialog which looks something like this:





- 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.



- 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.

8.2.2 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.

8.3 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.

9 NOTES

- 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()
```

- If the client-side application is running on Big-endian type of 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));
```

10 SUPPORT INFORMATION

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

