GENERAL INFORMATION ON
BORSA İSTANBUL
DATA DISSEMINATION
INFRASTRUCTURE

CONTENTS

General Information on Borsa Istanbul Data Dissemination Infrastructure   PUBLIC

1   SCOPE AND AIM

This document is aimed at providing general information on Borsa İstanbul's data dissemination communication infrastructure to the Data vendors that have already connected/will connect to Borsa İstanbul data dissemination systems.

2   IT NETWORK ARCHITECTURE

2.1   Borsa İstanbul Main Building

In Borsa İstanbul's main building, a location with electricity, air-conditioning and cabinet infrastructure provided by Borsa İstanbul is allocated for Data vendors. Data vendors shall keep the systems and/or communication equipment they use to receive data at these allocated cabinets. The cabinets allocated by Borsa İstanbul are 19", 42RU high. The cabinets are divided into two sections of 21RU height, and each section is fed by two separate UPS systems. Energy feeds are finished at PDUs that contain 8 units each of schuko type power sockets (220V-16A).

Data vendors that prefer to use Borsa İstanbul cabinets and not to keep equipment within the building may connect to the structure over MetroEthernet lines as well. In such case, integration with the structure using the infrastructure of the telecommunications operators that have connections to Borsa İstanbul building is possible.

As shown in the structure detailed in Figure-1, Borsa İstanbul provides three Ethernet connections to each Data vendor's cabinet or MetroEthernet connection. Through these connections supported by 10/100/1000 Mbps, Data vendors connect to Borsa İstanbul's key/router equipment that carries out data dissemination, and receive market data.

Two of these three connections (MAIN and BACKUP) will be used for all market data that the Data vendor is authorized to receive, as well as recovery requests. These two connections will fully back up each other and will be capable of carrying completely the same data.

The third connection, on the other hand, is for test purposes, and is designed to be used for the initial connection tests, development and problem solving procedures. Borsa İstanbul communication infrastructure is designed on full redundancy basis.

Borsa İstanbul's responsibility goes as far as the end of the Ethernet cable that provides connection to the Data vendor's cabinet or MetroEthernet network. From this point on, the responsibility of receiving, processing, carrying and backing up of data lies with Data vendors.
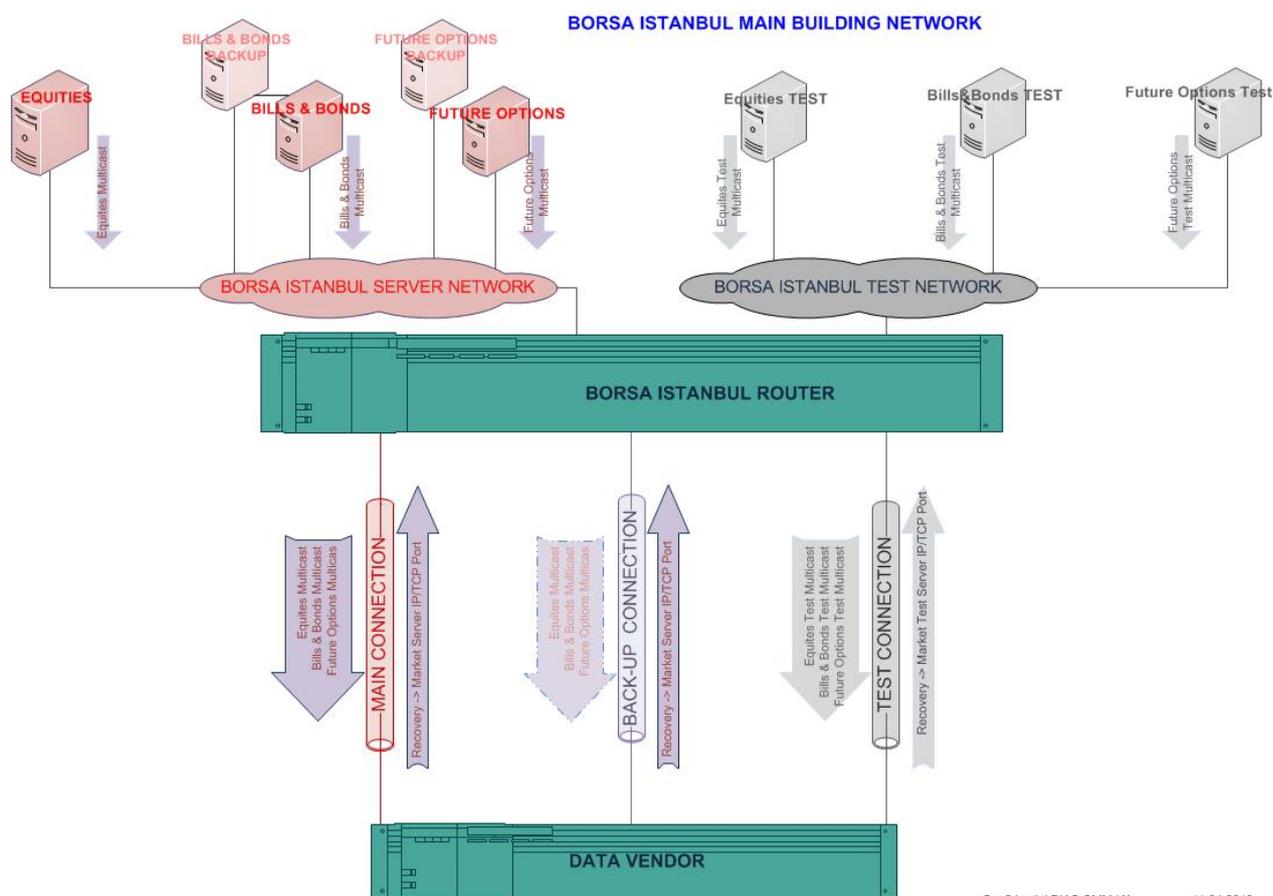
Figure 1 Borsa İstanbul Main Building data dissemination connection scheme

Data for all the markets that the Data vendor is authorized to receive will be disseminated over both of the active connections, namely MAIN and BACKUP. Market data will be sent to the Data vendors statically over the MAIN and BACKUP connections. Content of the data sent through MAIN and BACKUP connections is identical.

Information on recovery is available under "4- General Operation Rules of Recovery".

Backup system IP addresses are also allocated for the data dissemination of the Debt Securities Market and Futures and Options Market. There is no backup data dissemination system IP address for the Equity Markets.

Data vendors will access Borsa İstanbul data dissemination systems via the IP addresses to be allocated by Borsa İstanbul and there will be no access through another IP address. Data vendors may apply only ping (access to the connection point) tests on Borsa İstanbul key/router equipment and will have access to the relevant market server through the permitted TCP port only, and the structure will not be accessible from any other IP address and TCP/UDP port.

Connection IP addresses, multicast dissemination IP addresses and port information for the current Markets will be determined by Borsa İstanbul.

2.2 DISASTER RECOVERY NETWORK

Borsa İstanbul uses Türk Telekom A.Ş.'s data center located in Ankara Ümitköy for disaster recovery purposes. Data vendors will be connected to the data dissemination infrastructure located at Borsa İstanbul Disaster Recovery Network via the point to point MetroEthernet circuits over Türk Telekom A.Ş.'s network, with no backup. Data vendors will determine the line speeds of the MetroEthernet circuits they will connect to the Disaster Recovery Network in consideration of the data characteristics given below.

3 IMPORTANT ASPECTS ABOUT DATA DISSEMINATION TRAFFIC CHARACTERISTICS

In determining the capacity of the system and/or connection equipment through which Data vendors will receive Borsa İstanbul data and also the capacity of the lines through which such received data will be carried to the Data vendors' headquarters, it is important to know about Borsa İstanbul's market data dissemination traffic pattern. Traffic graphs related to the Markets and the issues that Data vendors must pay special attention on such traffic graphs are explained below.

Equity Market data dissemination means sending all data completely at once –refresh- in order to inform the Data vendors of the situation in the Market at the beginning and end of the sessions. Normally, the band width is under 1 Mbps (Figure-2). However, at times of "refresh", momentary values of 6 Mbps are observed (Figure-3). Futures & Options Market data may from time to time reach a peak value of approximately 4 Mbps. It is important for the Data vendors to consider burst traffic in determining equipment and line connection capacity.
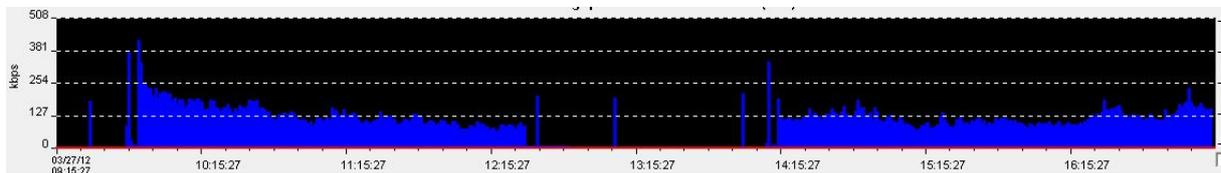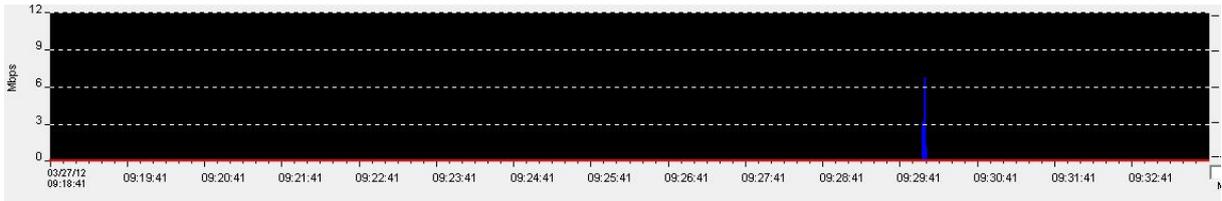

Figure-2 Typical daily data flow

Figure-3 Equity Market momentary refresh data flow

Data subject to dissemination are carried in small packages. Intensive traffic made up of momentary small packages (refresh) may experience losses even if it is under the given capacity of the equipment in question. Figure-4 displays the frame length distribution of the data subject to dissemination. Due to this characteristic, recovery process is very important. Active operation of the system is attained only if the recovery process is in full operation.
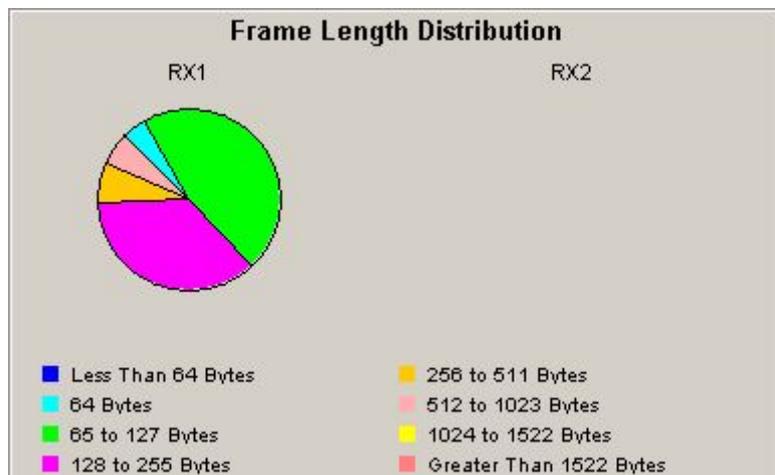

Figure-4- Frame Length Distribution

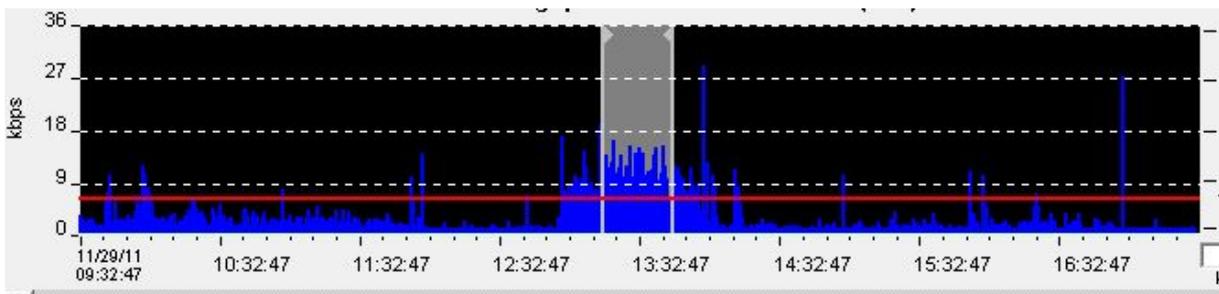Typical dissemination traffic pattern in the other Markets is given in Figures 5 & 6.

Figure-5 Typical data dissemination pattern for Debt Securities Market

The approximate maximum number of data dissemination messages created in Borsa İstanbul markets as of October 10, 2013 is given in the table below.

	No. of Peak Messages (seconds)	Total No. of Messages (Daily)	Average No. of Messages (seconds)
Equity Market Data Dissemination	2,000	3,000,000	150
Debt Securities Market Data Dissemination	1,000	100,000	5
Futures and Options Market Data Dissemination	4,000	500,000	25

Required band width may change as the types of markets and types of data dissemination increase. The changes will be advised to the Data vendors, who will be asked to adapt to such changes within the specified time period.

Tests on the test connection, which require intensive data flow, are planned to be held outside the market hours, if possible. However, Data vendors are recommended to make an effort to diminish the risk of data flowing from the test connection to fill the current wide area connections. It is recommended that the data coming from the test connection is interrupted and put on if necessary, or test data is put off by prioritization.

4   GENERAL OPERATION PRINCIPLES OF RECOVERY

For the recovery operations on Borsa İstanbul Markets data dissemination, access to recovery service from a single system IP address will be provided. For Equity Market data dissemination, Data vendors may establish only one recovery connection over each connection line. For the Debt Securities Market and Futures and Options Market, the total number of connections that may be provided over both lines is determined as 2 (subject to change). Connection is provided through TCP/IP data communication protocol.

For the Equity Market Data Dissemination, the number of recoveries for Data vendors during a trading session is limited to 9,999. In the event that the number of recovery requests in one session approaches this limit or the number of total number of packages subject to recovery is more than ~5% of the daily number of packages sent, Data vendors are prevented from recovery temporarily. Connection is re-established after Data vendors notify Borsa İstanbul that their recovery problems have been solved.

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5   TEST PROCEDURE

Data vendors that have completed the connection procedure and that have been provided access to test environments are required to successfully complete the test procedures for transition to the production environment.

- Unicast and multicast neighborhood will be established in the connection points. Such neighborhood will be confirmed through access test (ping) and multicast protocols in the connection equipment.

- In order to measure the package losses in multicast data dissemination, Data vendors are required to log the packages they receive during the test period and send such to Borsa İstanbul Data Dissemination Support Unit. The relevant unit will perform analyses on such logs, as a result of which, Borsa İstanbul may either request the company to send logs again or decide that the company has passed the multicast data package loss ratio compliance test.

- For package losses experienced during multicast data transmission, the recovery procedure must have been realized by the Data vendor and must be running smoothly. In the test environment provided for the Data vendors, Data vendors will be checked to see whether they can make at least one successful recovery request in the desired format.

6   PUBLIC DISCLOSURE PLATFORM (PDP) NEWS SYSTEM

PDP News Broadcast System means the entire infrastructure applications that provide data dissemination from PDP systems to the world. This system provides data dissemination through XML packages, one of the most frequently used technologies for integration purposes in data dissemination. Other systems may have recourse to PDP Publication Guide for integration with PDP systems.

6.1   Connection to PDP Data Dissemination Systems

- Borsa İstanbul data dissemination support unit will provide the Data vendor a user name and password for access to PDP data dissemination test and production applications.

- Data vendors need to access the PDP data dissemination test/production server's IP address over the Internet in order to connect to the PDP data dissemination test/production system. Data vendors must advise their Internet IP addresses to Borsa İstanbul data dissemination support unit to ensure access.

6.2 PDP News System Test Procedure

Data vendor must complete the following phases:

- Ensure connection to the data dissemination test server using the user code and password.

- After connecting to the data dissemination test server, receive the XML data regarding the test messages indicated by the data dissemination support unit, and process such XML data in its systems smoothly.

- Send the display of the XML interpretations of the test messages on their screens to those officials responsible for the PDP system.

- Have Borsa İstanbul data dissemination support unit to check the access logs in the PDP server.

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