

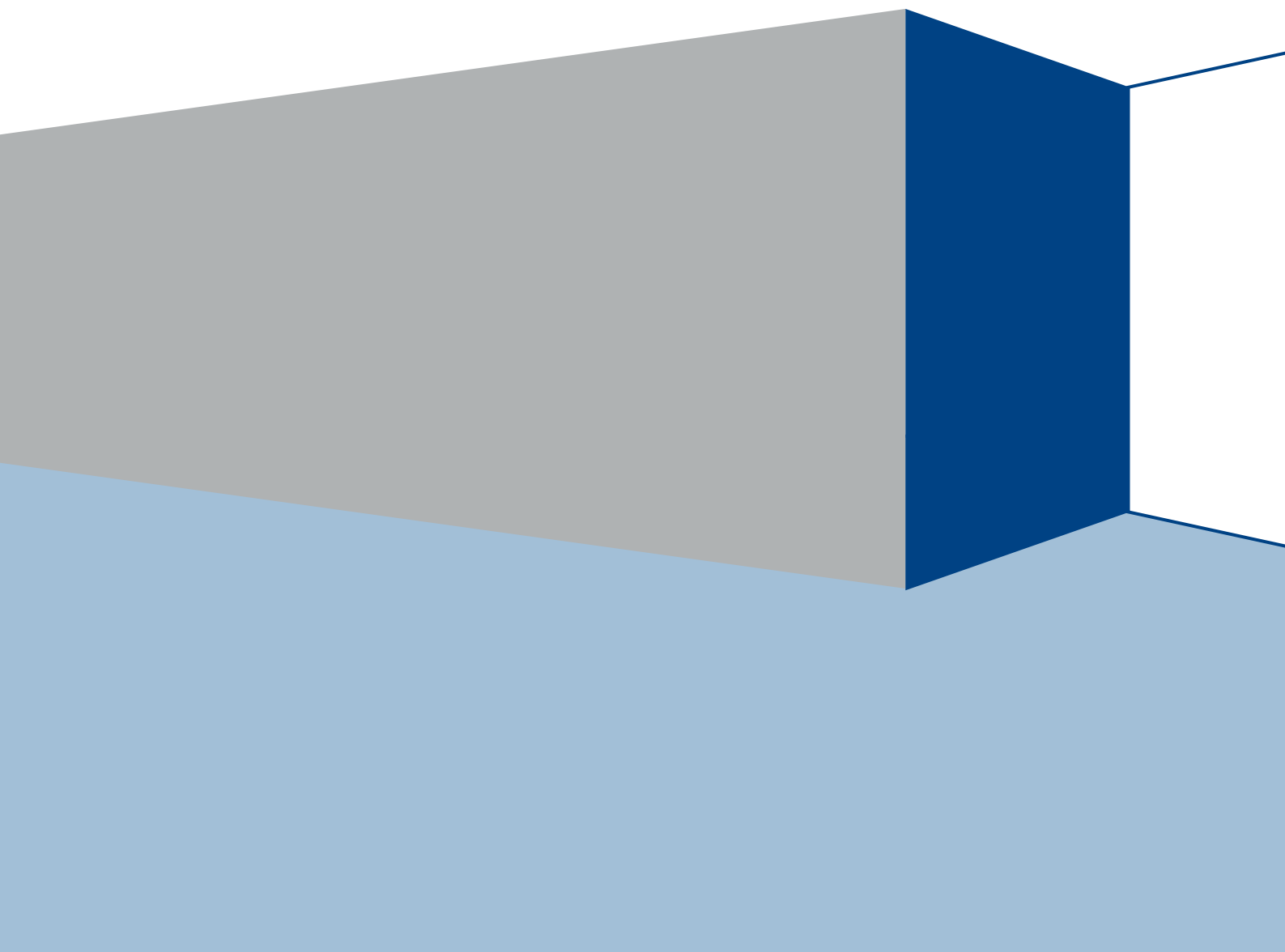


London
Stock Exchange

Service and Technical Description

Blt Network Service

Issue 1.1 · January 2012



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1 Introduction

BiT Network is the fully-managed private network used by the Borsa Italiana to provide access to our trading and information systems.

With the addition of new markets and continuing organic growth, there is a clear requirement for increased bandwidth to support access to all Borsa Italiana platforms and services.

1.1 Purpose of this document

The purpose of this document is to provide customers with an overview of the new 40Mb/100Mb/1Gb Bit Network service (the “Service”).

This document provides details on the service and its introduction, including the delivery timescales, service deployment model and types of equipment used including appropriate power, space and cooling requirements

This document constitutes a supplement to, and forms part of, the Technical Specification set of documents published by Borsa Italiana.

1.2 Associated Documentation

Further information on each of these services can be found in a range of documents from the Exchange’s website:

Millennium Exchange

<http://www.borsaitaliana.it/borsaitaliana/intermediari/gestione-mercati/migrazionemillenniumit-mit/millenniumitmigration.en.htm>

Access to Millennium exchange production and test services will be available via the Bit Network service.

TradElect™ and Infolect®

This document serves as an addition to Network Specification document TIS103 which can be found on the Exchange’s website:

<http://www.borsaitaliana.it/borsaitaliana/intermediari/gestione-mercati/mercatibit-tradelect/mercatibit-tradelect.en.htm>

MDF/DDM+

<http://www.borsaitaliana.it/borsaitaliana/intermediari/gestione-mercati/mdf-ddmplus/mdf-ddmplus.en.htm>

IDEM SOLA

<http://www.borsaitaliana.it/borsaitaliana/intermediari/gestione-mercati/migrazioneidem/migrazioneidem.en.htm>

Blt Clearing Station (BCS)

<http://www.borsaitaliana.it/borsaitaliana/intermediari/gestione-mercati/bcs-bitclearingstation/bcs.en.htm>

Blt Trading Station (BTS)

<http://www.borsaitaliana.it/borsaitaliana/intermediari/gestione-mercati/bts-bittradingstation/bts.en.htm>

2 Technical Configuration

2.1 Service Description

The service is composed of one (in case of non resilient service, not available for 1Gb service) or two lines (in case of resilient service). In case of resilient services, the lines are provided by two different carriers (chosen by Borsa Italiana).

The available bandwidth sizes are:

- 40 Mb (resilient or non resilient)
- 100 Mb (resilient or non resilient)
- 1 Gb (resilient only)

2.2 Physical Connection

The new service will be delivered by fibre optical or copper cable directly to customer sites. The circuit will have RJ45 presentation for the customer's network service access point.

The customer's network service access point at the Network Layer will be a pair of **Juniper EX-3200** switches.

The Physical SAP service connection is delivered over copper, using the standard RJ45 physical socket, auto MDI/MDI-X.

2.3 Physical Cabling and Connectivity

The equipment that is installed within the client site includes transmission and IP (Internet Protocol) equipment. As mentioned elsewhere in the document, the actual location of the equipment may vary depending on what is already installed at a customer site and what accommodation is available at the site; however the actual connectivity between the IP devices doesn't really change.

2.3.1 Device Names

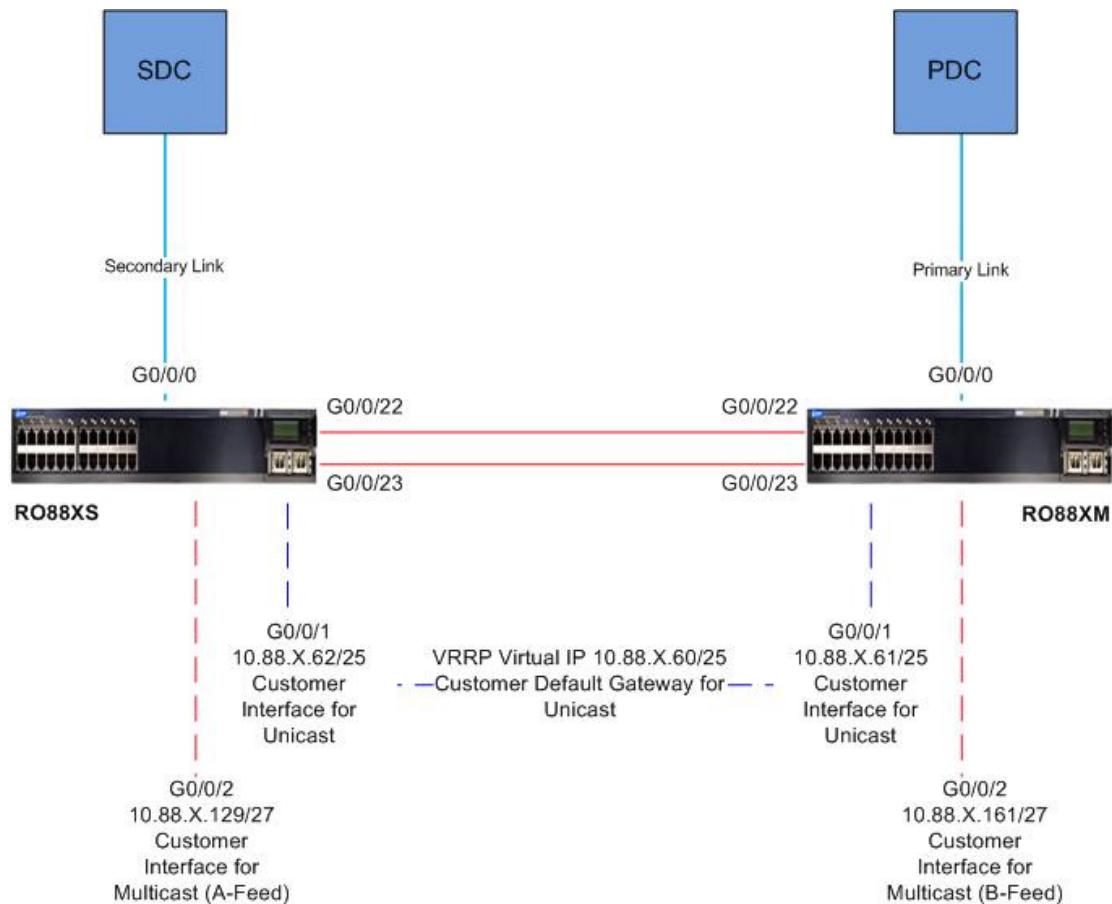
The devices are labeled as follows:

- Primary Juniper EX-3200 switch: RO88XXXM
- Secondary Juniper EX-3200 switch: RO88XXXS

Where XXX is the Blt Network Code (001, 002, etc.).

2.3.2 Production Connectivity

- RJ45 copper connection from the transmission equipment connects to each Juniper EX-3200 on port GigabitEthernet 0/0/0.
- The two Juniper EX-3200 connect together using two copper straight cables:
 - One between port GigabitEthernet 0/0/22 of each device
 - One between port GigabitEthernet 0/0/23 of each deviceThis is effectively the resilient path which is used in case of the failure of one WAN link (this is shown as black on the diagram below).
- The client LAN interconnect is connected to
 - GigabitEthernet 0/0/1 on both Juniper EX-3200 for the Unicast traffic
 - GigabitEthernet 0/0/2 on both Juniper EX-3200 for the Multicast traffic



2.4 Customer IP Addressing

The Exchange will assign blocks of registered addressing for use. The customer will be given two /25 VLANs (configured on two different interfaces, as shown in the above picture):

- **VLAN 1**, for Unicast Traffic:
 - subnet is 10.88.X.0/25
 - 10.88.X.61 is the physical address of the customer interface of the primary customer device (G0/0/1)
 - 10.88.X.62 is the physical address of the customer interface of the secondary customer device (G0/0/1)
 - 10.88.X.60 is the VRRP Virtual IP address (customer gateway)
- **VLAN 2**, for **A Feed** Multicast Traffic:
 - subnet is 10.88.X.128/27
 - 10.88.X.129 is the physical address of the customer interface of the primary customer device (G0/0/1)
- **VLAN 3**, for **B Feed** Multicast Traffic:
 - subnet is 10.88.X.160/27
 - 10.88.X.161 is the physical address of the customer interface of the secondary customer device (G0/0/1)

The customer is free to assign other addresses (belonging to the above subnets) as source IP for to test and production services.

2.4.1 Separation between Interconnection Subnet and Service Subnet

It is **optionally** possible access to Unicast Services only from VLANs different from **VLAN 1** (10.88.X.0/25), these Subnets:

- will have to be assigned by Borsa Italiana
- will belong to 10.88.0.0/16
- the default gateway for accessing these subnets will be 10.88.X.1

2.5 Millennium Exchange Services

The Millennium Exchange Services will feature active/active primary (A Stream) and secondary (B Stream) of market data being delivered at the same time.

Both streams will contain identical market data however the source and group IP Multicast addresses will be different.

The two streams of data will be sourced from the Primary and Secondary LSE data centres and therefore there will be a generally consistent time differential between receiving the A and B stream.

Each feed will have its own source IP address with different multicast destination addresses; all of these addresses will be registered.

Reply and Recovery services will be provided separately through the two lines (Reply and Recovery services for A Stream through the primary line and Reply and Recovery services for B Stream through the secondary line). These services will be provided through the **VLAN 1** (dedicated to Unicast Traffic).

Multicast will be forwarded statically to customer without any dynamic multicast routing protocol.

2.6 SOLA/BTS/BCS Services

The SOLA/BTS/BCS Services provide a unicast connection to the SOLA/BTS/BCS central systems located in the Milan Primary datacentre. The unicast connections are routed as follows:

- the standard path is the Primary Link
- in case of failure of the Primary Link, connections are routed via the Secondary Link to the Primary Datacentre
- in case of failure of activation of the Disaster Recovery site (for SOLA/BTS/BCS services, located in London at LSE primary Datacentre):
 - connections are routed through the Primary Link via the Primary Datacentre (if the Primary Link is available and the Primary Datacentre is available as network hop) to London via the Borsa Italiana-LSE backbone
 - if the Primary Link is not available, connections are routed through the Secondary Link via to the Secondary Datacentre and then (via the Primary-Secondary Datacentre connection) via the Primary Datacentre (if the Primary Datacentre is available as network hop) to London via the Borsa Italiana-LSE backbone
 - if the Primary Datacentre is not available, connections are routed through the Secondary Link via the Secondary Datacentre to London via the Borsa Italiana-LSE backbone

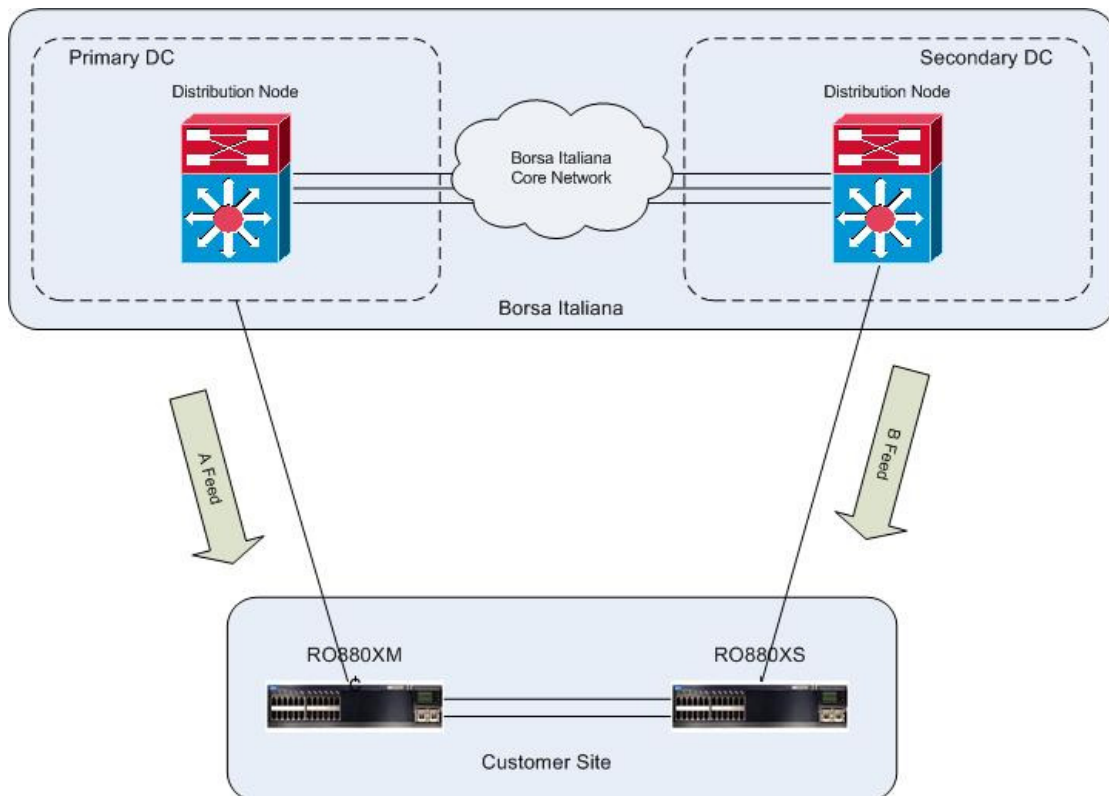
2.7 MDF/DDM+ Services

The MDF/DDM+ Services provide a unicast connection to the MDF/DDM+ central systems located in the Milan Primary Datacentre. The unicast connections are routed as follows:

- the standard path is the Primary Link
- in case of failure of the Primary Link, connections are routed via the Secondary Link to the Primary Datacentre
- in case of failure of activation of the Disaster Recovery site (in the Secondary Datacentre):
 - connections are routed through the Primary Link via the Primary Datacentre (if the Primary Link is available and the Primary Datacentre is available as network hop) to the Secondary Datacentre
 - if the Primary Link is not available, connections are routed through the Secondary Link via to the Secondary Datacentre
 - if the Primary Datacentre is not available, connections are routed through the Secondary Link to to the Secondary Datacentre

2.8 Traffic Flow Diagram

The diagram below depicts the topology and traffic flows for Millennium IT:



3 Customer Support

3.1 Client Technology Services Italy

The Client Technology Services Italy will provide its 1st line technical support via its Service-Desk:

Service-Desk@borsaitaliana.it

Toll Free: 0080026772000

From mobile: +39 02 45411399

4 How to Order

Member firms have to request the line over the BIt Club website. Service Providers or Information Vendors will have to sign a specific request form, please contact Clients-Services (Clients-Services@borsaitaliana.it) for further details.



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