

# Borsa Italiana new connectivity options – Technical Description

## 1 CONNECTIVITY SERVICE VIA THE NEW CLIENT MANAGED CONNECTIVITY

The Borsa Italiana production and test environments can be reached via the new Client Managed Connectivity (CMC), connecting to the port(s) of some CMC devices (referred to in the following as "Client Access Port(s)") in the Euronext PoPs at Interxion LON1 and Equinix LD4 (referred to as the "Euronext PoPs") or in the Euronext production data centre at Aruba IT-DC3 (referred to as the "Production Data Centre").

The client can choose to use the existing ports already in place for the connection to Euronext markets or to order new ones.

In order to access Borsa Italiana, a physical connection must be made between the Client's equipment and CMC devices. Clients can choose their preferred carrier.

The IP addresses and multicast groups are the ones currently used for accessing Borsa Italiana via the other available connectivity options. Details are available at:

- a) Millennium IT: <https://www.borsaitaliana.it/borsaitaliana/gestione-mercato/migrazionemillenniumit-mit/millenniumitmigration.htm>
- b) SOLA – IDEM: <https://www.borsaitaliana.it/borsaitaliana/gestione-mercato/migrazioneidem/migrazioneidem.htm>
- c) Group Ticker Plant: <https://www.borsaitaliana.it/borsaitaliana/gestione-mercato/group-ticker-plant/overview.htm>

### 1.1 PHYSICAL CONNECTION DETAILS

#### 1.1.1 Production Data Centre and Euronext PoPs

The Euronext Production Data Centre is located at:

Aruba IT3  
Via San Clemente 53  
24036 Ponte San Pietro (BG)  
Italy

The Euronext PoPs are hosted in the following facilities:

Interxion LON1  
11, Hanbury Street  
London E1 6QR  
UK

and

Equinix LD4  
2, Buckingham Ave  
Slough SL1 4NB  
UK

### 1.1.2 CMC Access in Production Data Centre (Aruba IT-DC3)

The physical connection between Clients' equipment and Borsa Italiana equipment (CMC devices) must be delivered at the Production Data Centre within the Meet Me Rooms (MMRs) where the carriers chosen by the Clients have a point of presence.

Euronext Colocation Clients wishing to be connected via CMC in the Production Data Centre need to order a Cross-Connect to the MMR for each Client Access Port required.

Clients with a point of presence in the Production Data Centre and wishing to be connected via CMC in the Production Data Centre need to order a circuit from their preferred carrier, which must reach at least the carrier's first available node (outside the Production Data Centre), existing as per the date of this policy, before terminating in the Production Data Centre's MMRs.

Within the Production Data Centre, Clients can choose one or more Client Access Ports, through which Clients can receive unicast services and multicast services (Feed A or Feed B on each port).

### 1.1.3 CMC Access – Connection via Euronext PoPs (Interxion LON1 and Equinix LD4)

The physical connection between Clients' equipment and Borsa Italiana equipment (CMC devices) must be delivered at the Euronext PoPs within the Meet Me Rooms (MMRs) where the carriers chosen by the Clients have a point of presence. In the case that Clients have a point of presence in the Euronext PoPs, the connections can be realised by Clients via cross-connects subject to prior written consent from Borsa Italiana.

In both cases, Clients need to terminate their circuit or cross-connect at the demarcation point, in the Euronext PoPs, assigned by Borsa Italiana.

Within each Euronext PoP, Clients can choose one or more Client Access Ports, through which Clients can receive unicast services and multicast services (Borsa Italiana Feed A is available at Interxion LON1 only, Borsa Italiana Feed B is available at Equinix LD4 only).

### 1.1.4 Physical handoff

For all CMC cross connects, either in the Production Data Centre or in the Euronext PoPs, the required physical handoffs are single-mode fibre with LC connectors.

Bandwidth options for Client Access Ports are:

- ✓ 100 Mbps
- ✓ 1 Gbps
- ✓ 10 Gbps.

Within the Production Data Centre, Borsa Italiana will provide the cross-connect from the carrier's demarcation point or, for Colocation Clients only, from the Client's demarcation point in the Meet Me Room (MMR), to the Client Access Port provided on the Borsa Italiana equipment.

Clients with a CMC access in the Production Data Centre must communicate to Borsa Italiana, as soon as practical, their demarcation points in the MMR (for Colocation Clients only) or the circuit termination details provided by the Carrier.

Within the Euronext PoPs, Clients are responsible for terminating their circuit or Cross-Connects at the demarcation point assigned by Borsa Italiana.

Borsa Italiana will communicate to the Clients the demarcation points in the MMRs to be provided to the Carrier or used by the Client itself for the cross-connect in the Euronext PoPs.

Below is the list of MMRs to be used at each Data Centre and Euronext PoPs:

- Production Data Centre:
  - Blue Room (primary)
  - Yellow Room (secondary)
  
- Interxion LON1 PoP:
  - 205G (primary)
  - 214C (secondary)
  
- Equinix LD4 PoP:
  - MER North LD4.2 (primary)
  - MER South LD4.2 (secondary)

For Clients that have two circuits/cross-connects connected to the same Data Centre or Euronext PoP, the Clients must deliver the primary circuit/cross-connect to the MMR classified as "primary" within the corresponding Data Centre or Euronext PoP, and the secondary one to the MMR classified as "secondary".

For Clients that have only one circuit/cross-connect in the Production Data Centre or Euronext PoP, the MMR in which to deliver the circuit must be agreed with Borsa Italiana.

The following requirements are valid for all CMC Services (either in the Data Centres or in the Euronext PoPs).

## 1.2 SECURITY CONTROLS

It is the responsibility of the Client to implement security controls between the Client equipment at the Client site and CMC devices at the Production Data Centre or Euronext PoPs.

It is expected that Clients will use firewalls to implement security controls between the CMC devices and their own networks. Any firewall installed between the Client and the CMC devices must be able to allow IP multicast packets to pass through.

Borsa Italiana will implement the following security controls to minimise the risk of unauthorised access to the network:

- (a) Incoming and outgoing filters ensure a Client can exchange only pre-defined and agreed-upon routing information.
- (b) Each Client Access Port will maintain an access list of allowable IP addresses and only packets from addresses in that list will be permitted through the Client Access Port.

## 1.3 NETWORK CONFIGURATION

Borsa Italiana uses TCP/IP (Transmission Control Protocol/Internet Protocol) for network connectivity. The Exchange currently only supports IPv4.

### 1.3.1 Logical Interfaces

Borsa Italiana will provide an L3 router port over each Client Access Port. Borsa Italiana uses L3 point-to-point logical connections.

Clients should configure the relevant local L3 interfaces on their devices for valid connectivity.

To enable Clients to confirm connectivity between their own Client equipment and Borsa Italiana equipment, Borsa Italiana supports ICMP 'ping' messages to the Borsa Italiana Interface IP address.

### 1.3.2 Point to Point IP Addressing and Routing

Borsa Italiana will assign IP addressing for the network links between Client equipment and Borsa Italiana equipment as follows.

For each network link between the Client equipment and the assigned Client Access Port on the CMC device, Borsa Italiana will provide a /30 RFC1918 address range. The highest usable IP address within each range will always be reserved for the Client Access Port of the point to point network link.

IP Ranges are as follows:

- 10.54.0.0/16
- 10.55.0.0/16
- 10.56.0.0/16
- 10.57.0.0/16

Borsa Italiana reserves the right to assign different ranges to Clients. Upon client request and on a non-discriminatory basis, Borsa Italiana may evaluate and accept exceptions to the aforementioned ranges.

Client routing from the Client Access Port until the Client's equipment is the responsibility of the Client.

BGPv4 is the routing protocol to be used between Borsa Italiana equipment and Client equipment, for the dynamic propagation of routing information, and is available on all Client Access Ports.

Euronext will use a public registered AS number and assign to each Client a private AS number.

### 1.3.3 Client IP Addressing

The Client subnets that will directly interface with Borsa Italiana Services will be provided by Borsa Italiana.

As standard, the following subnets are offered to the Clients for each their geographical and logical sites:

- 1x subnet /26, split as follows:
  - The lowest /27 subnet for access Production environment
  - The highest /27 subnet for access EUA Environment
- In the case of Service Providers ordering direct Client Access Ports, when technically applicable, a specific /26 subnet for each End User will be allocated.

IP ranges for the Clients' subnets will be as follows:

- 10.52.0.0/16
- 10.54.0.0/16
- 10.55.0.0/16
- 10.56.0.0/16
- 10.57.0.0/16
- 10.205.0.0/16

For all CMC connections, Clients must present themselves to the Production and EUA environments with addresses that belong to the given subnet.

Where Clients use a different private addressing scheme, or if there is conflict between the IP addresses allocated by Borsa Italiana and the Client's network, then Network Address Translation (NAT) must be performed. Any NAT device should employ static address translation. Responsibility for NAT is with the Client.

Upon client request and on a non-discriminatory basis, Euronext may evaluate and accept exceptions to the above network configurations.

In the case that Clients decide to use the same Client Access Ports used for accessing Euronext, the same source IPs will be assigned by Borsa Italiana and Euronext. In all other cases a different subnet will be assigned for accessing Borsa Italiana and Euronext.

### 1.3.4 Network failover

For rapid failover detection, Borsa Italiana supports BFD (Bi-directional Forwarding Detection) between the Client Access Port on the CMC device and the Client equipment.

The network has been designed to be resilient through the use of its optimised network infrastructure.

If there is a failure of the primary Client Access Port, which should be the prioritised connection for traffic with Borsa Italiana under normal market conditions, then network connectivity with Borsa Italiana will automatically be maintained via the secondary Client Access Port (if any). Any physical investigation work related to a Client Access Port will be performed outside of market hours.

The initial failover configuration must be agreed between the Client and Borsa Italiana, as well as to any change to the initial configuration.

It is recommended that Clients with resilient connections undertake regular failover testing to verify that all functionality behaves as expected on both primary and secondary connections.

## 2 CONNECTIVITY SERVICES VIA THE NEW EURONEXT COLOCATION SERVICES

The Borsa Italiana production and test environments can be reached via the Euronext Colocation Services at Aruba IT-DC3.

### 2.1 PHYSICAL CONNECTION DETAILS

For the connection to Borsa Italiana, Borsa Italiana will provide two Client Access Ports in the patch panel of the Colocation Cabinet chosen by the Client for this connection.

On the two ports, Clients receive Feed A on the primary port and Feed B on the secondary port. In normal conditions unicast traffic is active on the primary port only.

IP addresses and multicast groups are the ones currently used in the Borsa Italiana colocation and are available at the following links:

- a) Millennium IT: <https://www.borsaitaliana.it/borsaitaliana/gestione-mercato/migrazione-millennium-it-mit/millennium-it-migration.htm>
- b) SOLA – IDEM: <https://www.borsaitaliana.it/borsaitaliana/gestione-mercato/migrazione-idem/migrazione-idem.htm>
- c) Group Ticker Plant: <https://www.borsaitaliana.it/borsaitaliana/gestione-mercato/group-ticker-plant/overview.htm>

#### 2.1.1 Physical handoff

The required physical handoff is single-mode fibre with LC connectors. Bandwidth available is 10 Gbps.

### 2.2 SECURITY CONTROLS

It is the responsibility of the Client to implement security controls between the Client equipment at the Client site and CMC devices at the Production Data Centre or Euronext PoPs.

It is expected that Clients will use firewalls to implement security controls between the CMC devices and their own networks. Any firewall installed between the Client and the CMC devices must be able to allow IP multicast packets to pass through.

Borsa Italiana will implement the following security controls to minimise the risk of unauthorised access to the network:

- (a) Incoming and outgoing filters ensure a Client can exchange only pre-defined and agreed-upon routing information.
- (b) Each Client Access Port will maintain an access list of allowable IP addresses and only packets from addresses in that list will be permitted through the Client Access Port.

## 2.3 NETWORK CONFIGURATION

Borsa Italiana uses TCP/IP (Transmission Control Protocol/Internet Protocol) for network connectivity. The Exchange currently only supports IPv4.

A full explanation of IP is beyond the scope of this document. Clients are advised to refer to the Internet Engineering Task Force website for more detailed technical information about the Internet Protocol: [www.ietf.org](http://www.ietf.org)

### 2.3.1 Logical Interfaces

Borsa Italiana will provide an L3 router port over each Client Access Port. Borsa Italiana uses L3 point-to-point logical connections.

Clients should configure the relevant local L3 interfaces on their devices for valid connectivity.

To enable Clients to confirm connectivity between their own Client equipment and Borsa Italiana equipment, Borsa Italiana supports ICMP 'ping' messages to the Borsa Italiana Interface IP address.

### 2.3.2 Point to point IP Addressing and Routing

Borsa Italiana will assign IP addressing for the network links between Client equipment and Borsa Italiana equipment as follows.

For each network link between the Client Equipment and the assigned Client Access Port on the CMC device, Borsa Italiana will provide a /30 RFC1918 address range. The highest usable IP address within each range will always be reserved for the Borsa Italiana Client Access Port of the point to point network link.

IP Ranges are the following:

- 10.54.0.0/16
- 10.55.0.0/16
- 10.56.0.0/16
- 10.57.0.0/16

All IP addressing relating to Borsa Italiana Markets and Services will be made available to Clients as part of the onboarding process.

Borsa Italiana reserves the right to assign different ranges to Clients. Upon client request and on a non-discriminatory basis, Borsa Italiana may evaluate and accept exceptions to the aforementioned ranges.

Client routing from the Client Access Port until the Client's Equipment is the responsibility of the Client.

BGPv4 is the routing protocol to be used between Borsa Italiana Equipment and Client Equipment, for the dynamic propagation of routing information, and is available on all Client Access Ports.

Borsa Italiana will use a public registered AS number and assign to each Client a private AS number.

### 2.3.3 Client IP Addressing

The Client subnets that will directly interface with Borsa Italiana Services will be provided by Borsa Italiana and it will be different from the subnets used by the clients to access Euronext markets.

As standard, the following subnets are offered to the Clients for each of their geographical and logical site:

- 1x subnet /26, split as follows:
  - The lowest /27 subnet for access Production environment
  - The highest /27 subnet for access EUA Environment
- In the case of Service Providers ordering direct Client Access Ports, when technically applicable, a specific /26 subnet for each End User will be allocated.

IP ranges for the Clients' subnets will be as follows:

- 10.52.0.0/16
- 10.54.0.0/16
- 10.55.0.0/16
- 10.56.0.0/16
- 10.57.0.0/16
- 10.205.0.0/16

For all CMC Services, Clients must present themselves to the Production and EUA environments with addresses that belong to the given subnet.

Where Clients use a different private addressing scheme or if there is conflict between the IP addresses allocated by Borsa Italiana and the Client's network, then Network Address Translation (NAT) must be performed. Any NAT device should employ static address translation.

Responsibility for NAT is with the Client.

Upon client request and on a non-discriminatory basis, Borsa Italiana may evaluate and accept exceptions to the above network configurations.

### 2.3.4 Network failover

For rapid failover detection, Borsa Italiana supports BFD (Bi-directional Forwarding Detection) between the Client Access Port on the CMC device and the Client equipment.

The Borsa Italiana network has been designed to be resilient through the use of its optimised network infrastructure.

If there is a failure of the primary Client Access Port, which should be the prioritised connection for traffic with Borsa Italiana under normal market conditions, then network connectivity with Borsa Italiana will automatically be maintained via the secondary Client Access Port (if any). Any physical investigation work related to a Client Access Port will be performed outside of market hours.



The initial failover configuration must be agreed between the Client and Borsa Italiana, as well as to any change to the initial configuration.

It is recommended that Clients with resilient connections undertake regular failover testing to verify that all functionality behaves as expected on both primary and secondary connections.