

# **EURONEXT CLIENT MANAGED CONNECTIVITY (CMC)**

Service and Technical Description

2 JULY 2021

## PREFACE

---

### PURPOSE

The purpose of this Policy is to provide Clients with a detailed definition of the Euronext Client Managed Connectivity (CMC) service. This document is published by Euronext ("Euronext"). Other relevant documentation is also available from the website at

**[connect2.euronext.com/membership/resources/it-documentation](https://connect2.euronext.com/membership/resources/it-documentation)**

Capitalised terms used in this document though not defined herein shall either (I) have the same meaning as ascribed thereto in the legal documentation made available by Euronext in relation to its Client Managed Connectivity Service which governs the provision of the Client Managed Connectivity Service once executed by a Client and Euronext, or (ii) – in case not defined therein – the Rules.

---

### TARGET AUDIENCE

This document should be read by all Members and Non-Members interested in connecting to Euronext Markets.

This proprietary confidential document is the property of Euronext and constitutes Confidential Information of Euronext. Neither this document nor its contents may be disclosed to a third party, nor may it be copied, published, reproduced or used without Euronext's prior written consent.

Euronext uses reasonable efforts to arrange for that the data and other material in this Policy are correct and complete but does not accept liability for any error herein or omissions herefrom.

In addition, the information contained in this document does not constitute any representations or warranties by Euronext and does not alter the terms of any Other Euronext Agreements.

The development of Euronext products and services is continuous and published information may not be up to date or may change. It is important to check the current position with Euronext.

---

### WHAT'S NEW?

The following lists only the most recent modification made to this revision/version. For the Document History table, see the Appendix.

<b>REVISION NO./ VERSION NO.</b>	<b>DATE</b>	<b>AUTHOR</b>	<b>CHANGE DESCRIPTION</b>
0.1	June	Euronext	First Draft

This document may be amended at any time, and areas impacting service provision will in principle be effective following a 30 days' notice (in accordance with the General Terms and Conditions).

Euronext will distribute revised documentation to all Clients electronically once updated.

---

## **ASSOCIATED DOCUMENTS**

The following lists the associated documents, which either should be read in conjunction with this document or which provide other relevant information for the user:

For all Clients:

- Connectivity Services Order Form
- Connectivity Services Price List
- Euronext Data Centre Services General Terms and Conditions
- Connectivity Services Specific Terms
- This Policy

For Service Providers:

- Service Provider accreditation agreement

## CONTENTS

<b>1. SERVICE DESCRIPTION .....</b>	<b>6</b>
<b>2. OPEN CONNECTIVITY MODEL.....</b>	<b>7</b>
2.1 Client Access Options.....	7
2.1.1 Options for Clients .....	7
2.1.2 CMC Access .....	7
2.1.3 CMC Access – Connection via Euronext POPs .....	8
2.1.4 Connection via Service Providers.....	9
<b>3. TECHNICAL DESCRIPTION .....</b>	<b>10</b>
3.1 PHYSICAL CONNECTION DETAILS .....	10
3.1.1 CMC Access .....	10
3.1.2 CMC Access – Connection via Euronext PoPs.....	10
3.1.3 Physical handoff.....	11
3.2 SAP Requirements.....	11
3.2.1 Client side.....	11
3.2.2 Data Centre/PoP .....	12
3.3 Security Controls.....	12
3.4 Network configuration .....	12
3.4.1 Logical Interfaces.....	12
3.4.2 Euronext IP Addressing .....	13
3.4.3 Client IP Addressing .....	13
3.4.4 Routing.....	14
3.4.5 Network failover .....	14
<b>4. TESTING POLICY.....</b>	<b>15</b>
<b>5. GLOSSARY .....</b>	<b>16</b>



---

## 1. SERVICE DESCRIPTION

Client Managed Connectivity (CMC) provides an optimised network infrastructure, offering resiliency and scalability, to allow Clients to access Euronext Markets and Services with additional choice, flexibility and control. Euronext has an open connectivity model allowing Clients to select their preferred Carrier to support their Data and Markets access.

Euronext provides Clients with a choice of scalable physical access ports on which to terminate their chosen Carrier, underpinned by a resilient and scalable network infrastructure. Access ports can be provided in the Euronext Production and DR Data Centres directly or in the Euronext Points of Presence (PoPs) connected to the Euronext Production and DR Data Centres via the Euronext network.

---

## 2. OPEN CONNECTIVITY MODEL

The Euronext open connectivity model has been established to provide Clients with greater choice and flexibility when connecting directly to Euronext Markets.

In this model, Clients contract directly with their preferred Carrier for physical circuits between the Clients' premises and Euronext Production and DR Data Centres or between the Clients' premises and Euronext PoPs. In the case that Clients' sites and Euronext sites are in the same premises, the connections can be realised by Clients via cross-connects.

Prior to entering into any contractual arrangements for circuit provision from the Carrier, Clients should contact their Euronext Sale Representative to make sure that requirements are fully understood and can be met.

Clients should ensure that any circuits provided by Carriers can support the transportation of standard Ethernet frames.

---

### 2.1 CLIENT ACCESS OPTIONS

---

#### 2.1.1 Options for Clients

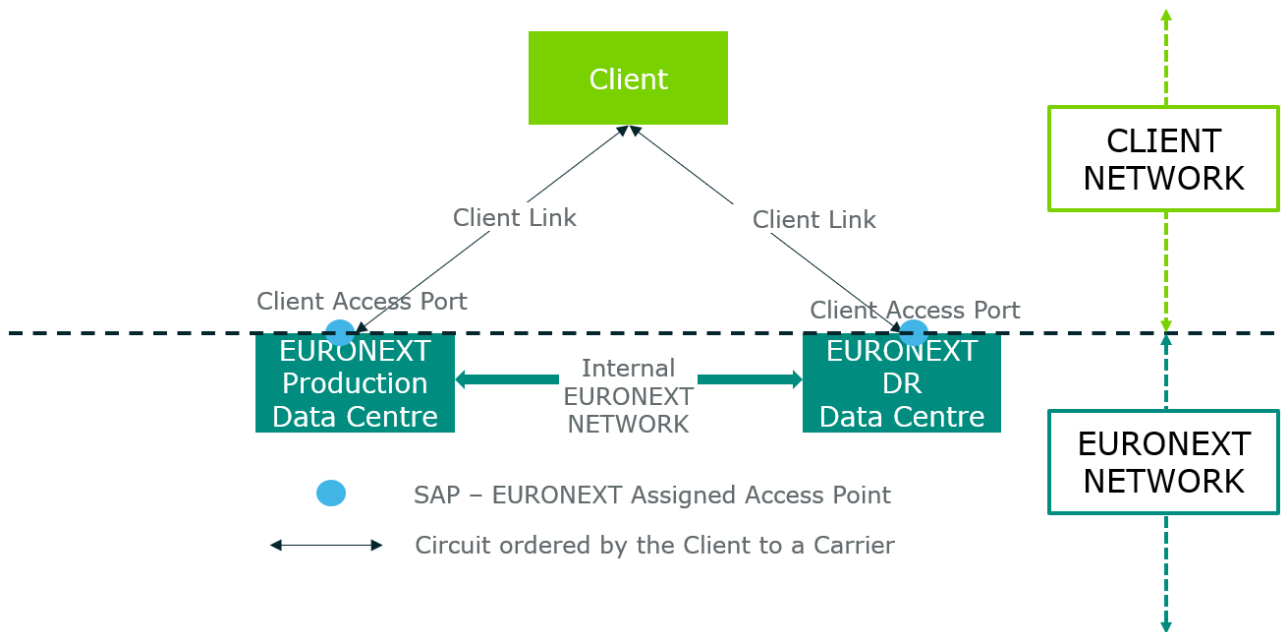
- Choice of access speeds from 100Mb to 10Gb
- Resilient or singular set-up, providing access to Production, EUA and DR facilities
- Support for all existing and future Euronext services
- Provides a secure environment supporting mission critical and sensitive transactions

---

#### 2.1.2 CMC Access

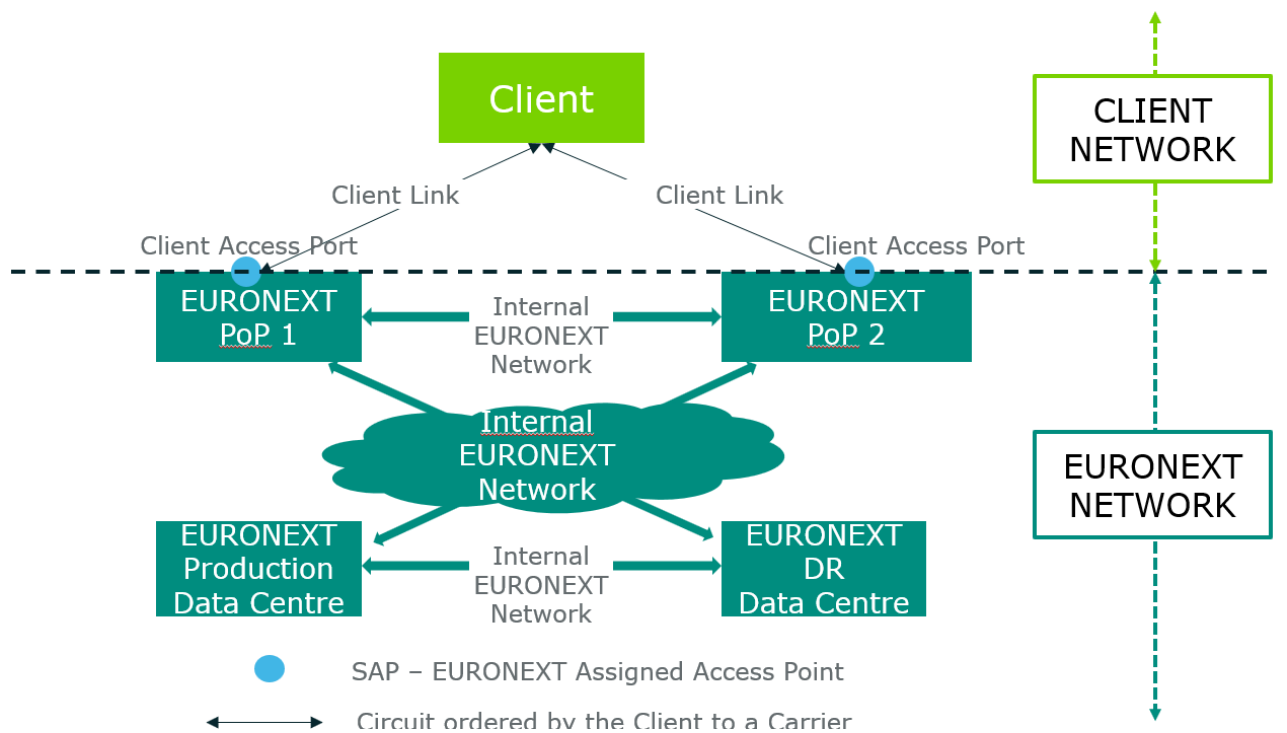
In this case, Clients' links will be connected directly to Client Access Ports in the Euronext Production and DR Data Centres.

Below an example of a Client configuration for CMC Access.



### 2.1.3 CMC Access – Connection via Euronext POPs

Markets and Services available across Euronext suite of products can be reached via the Euronext network, connecting to the CMC Access Point in the Euronext PoPs. Below an example of a Client configuration for CMC Access – Connection via Euronext PoPs.

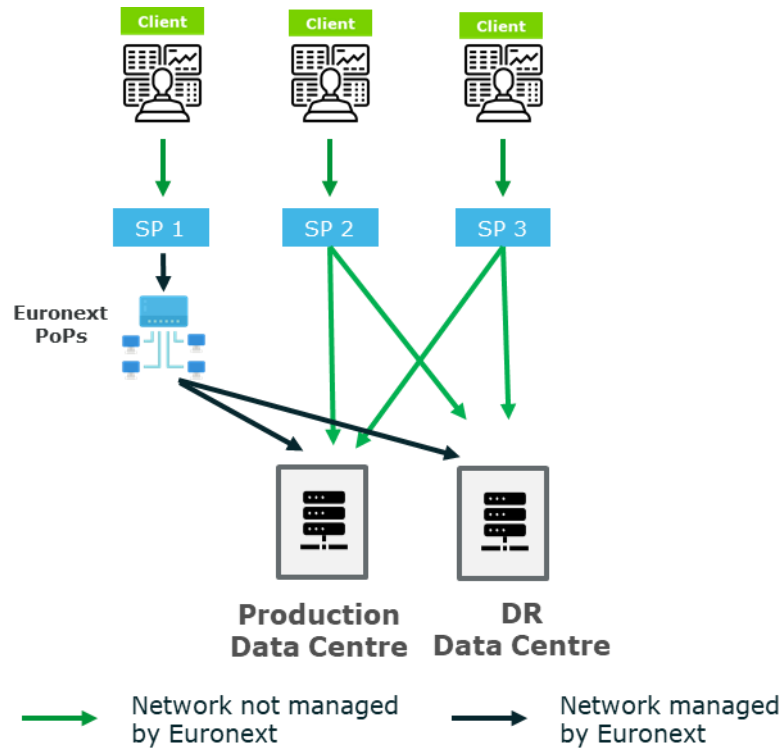




### 2.1.4 Connection via Service Providers

Another option for Clients to be connected to Euronext Markets and Services is via Service Providers, who have CMC Accesses in place.

Below some examples of possible connections via Service Providers:



---

## 3. TECHNICAL DESCRIPTION

This section describes the interface provided by Euronext to Clients who wish to access the Euronext Markets and related services, using the Client Managed Connectivity Service.

Clients should make sure they understand and complete any additional obligations required of particular Euronext Services before ordering connectivity.

---

### 3.1 PHYSICAL CONNECTION DETAILS

In order to access Euronext Services, a physical connection must be made between Clients' Equipment and Euronext Equipment.

---

#### 3.1.1 CMC Access

The physical connection between Clients' Equipment and Euronext Equipment must be delivered to the Production and/or DR Data Centres from a Carrier's Point of Presence within the Meet Me Room (MMR) in premises where the Production and DR Data Centres are located. In the case that Clients' sites and Euronext sites are in the same premises, the connections can be realised by Clients via cross-connects.

Within the primary Data Centre, Clients can choose one or more Client Access Ports, through which Clients can receive unicast services and multicast services (Feed A and B). Within the DR Data Centre, Clients can receive unicast services and multicast services on a Client Access Port only in case of activation of the Euronext DR.

Although Euronext strongly recommends choosing resilient solutions, according to Service Providers' minimum requirements and/or Clients' needs, several options are available, from the fully redundant solution to the non-resilient solution.

---

#### 3.1.2 CMC Access – Connection via Euronext PoPs

The physical connection between Clients' and Euronext Equipment must be delivered to the Euronext PoPs from Carrier's Points of Presence, which are located in the MMR within the same premises of the Euronext PoPs.

In the case that Clients' sites and Euronext sites are in the same premises, the connections can be realised by Clients via cross-connects.

Within each PoP, Clients can choose one or more Client Access Ports, through which Clients can receive unicast services and multicast services (Feed A and B).

Although Euronext strongly recommends choosing resilient solutions, according to Service Providers' minimum requirements and/or Clients' needs, several options are available, from the fully redundant solution to the non-resilient solution.

---

### 3.1.3 Physical handoff

For all CMC Services, either in the Data Centres or in the PoPs, the required physical handoff at the relevant Euronext Data Centres/PoPs are single-mode fibre with LC connectors.

Bandwidth options for Client Access Ports are:

- 100 Mbps
- 1 Gbps
- 10 Gbps.

---

## 3.2 SAP REQUIREMENTS

For all CMC Services, Client access to Euronext Markets and Services is made via a Service Access Point (SAP). Clients are responsible for providing their own switching/routing Client Equipment at their site. For physical access circuits between the Client site and Euronext sites, Clients are responsible for direct contractual relationship with the Carriers. Within Production and DR Data Centres or PoPs, Euronext will provide the cross-connects between the Client circuits at the Production and DR Data Centres or at the PoPs from the Carrier's demarcation point in the Meet Me Room (MMR) to the Client Access Ports provided on the Euronext Equipment.

The SAP provides both the physical and logical interface to the IP Network.

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

---

### 3.2.1 Client side

Clients should ensure that adequate facilities exist for the installation of the equipment supporting their SAP and the associated communications equipment e.g. the Carrier's circuits or the cross-connects. It is suggested that Clients should be vigilant and ensure that power supplies of the correct rating, adequate ventilation and appropriate environmental conditions are in place for their connectivity.

---

### 3.2.2 Data Centre/PoP

Clients must communicate to Euronext as soon as practical, the circuit termination details provided by the Carrier, or their demarcation points in the case that the Client's sites are in the same premises of the Production and DR Data Centres or the PoPs.

Euronext Data Centres/PoPs locations may vary from time to time, and Euronext will confirm the responsibilities for the Cross-Connects between the demarcation point of the Client's circuit in the MMR and the Euronext-assigned Client Access Port.

---

### 3.3 SECURITY CONTROLS

It is the responsibility of the Client to implement security controls between the Client Equipment at the Client site and Euronext Equipment at the Euronext Data Centres/PoPs.

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

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

- (a) Incoming and outgoing filters ensure a Client SAP 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.

---

### 3.4 NETWORK CONFIGURATION

Euronext 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)

---

#### 3.4.1 Logical Interfaces

Euronext will provide a L3 router port over each Client Access Port. Euronext 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 Euronext Equipment, Euronext supports ICMP 'ping' messages to the Euronext Interface IP address.

---

### 3.4.2 Euronext IP Addressing

Euronext will assign IP addressing for the network links between Client Equipment and Euronext Equipment as follows.

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

IP Ranges are the following:

- 10.54.00/16
- 10.55.0.0/16

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

---

### 3.4.3 Client IP Addressing

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

As standard, the following subnets are offered to the Clients for each SAP:

- 1x subnet /24, split as follows:
  - The lowest /25 subnet for access Production environment
  - The highest /25 subnet for access EUA Environment
- In the case of Service Providers ordering direct Client Access Ports, when technically applicable, a specific /24 subnet for each End User will be allocated.

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

- 10.54.00/16
- 10.55.0.0/16

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 there is conflict between the IP addresses allocated by Euronext 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.

The subnet is dedicated to a single Client SAP and cannot be used elsewhere on the Euronext network or via another Client SAP.

---

### 3.4.4 Routing

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 Euronext 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.

The /30 address range assigned to the L3 point-to-point connection determines the BGP peers on the subnet.

The highest usable IP address in the subnet will always be the Euronext BGP peer, whilst Clients should assign the next usable IP address to their BGP peer.

---

### 3.4.5 Network failover

For rapid failover detection, Euronext supports BFD (Bi-directional Forwarding Detection) between the Client Access Port on the Euronext Equipment and the Client Equipment.

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

Euronext is able to provide Client Access Ports at both Production and DR Data Centre, as well as Euronext PoPs.

If the primary Client Access Port, which should be the prioritised connection for traffic with Euronext under normal market conditions, fails, then network connectivity with Euronext will automatically be maintained via the secondary Client Access Port. Any physical investigation work related to a Client Access Port will be performed outside of market hours.

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.

---

## **4. TESTING POLICY**

Before asking for the enablement to Euronext Markets, Clients have to test their CMC accesses by performing an ICMP ping test to each BGP Peer.

After the enablement of the Production and/or Test Environment, Clients with resilient solutions are required to perform a fail over test over the links.

---

## 5. GLOSSARY

AS: Autonomous System

BFD: Bi-directional Forwarding Detection

BGP: Border Gateway Protocol

CMC: Client Managed Connectivity

ICMP: Internet Control Message Protocol

POP: Point Of Presence

SAP: Service Access Point