EURONEXT CLEARING

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Preface

PURPOSE

This document sets out the Euronext Clearing System technical guidelines. It describes the different access points and their interfaces, as well as the ways in which Clients can connect to the Clearing House Systems and prepare their integration with Euronext Clearing. Additionally, this document contains details of the first set of Reports. Future versions will include sections related to Throttling, and High Availability and Business Continuity functionalities.

Connectivity details, such as endpoints, will be provided in a dedicated separate document, to be released in due course.

TARGET AUDIENCE

All Euronext Clients that will adopt Euronext Clearing as their Clearing House.

WHAT'S NEW?

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

REVISION NO./ VERSION NO.	DATE	AUTHOR	CHANGE DESCRIPTION
1.4	15/07/2022	Euronext	First version

Contents

1 INTRODUCTION

Euronext is extending its competitive European offer to include clearing services, thus completing the value chain operated by the Euronext Group.

As announced on 9 November 2021, Euronext will make Euronext Clearing (formerly CC&G) the CCP of choice for the Euronext cash equity, listed derivatives and commodities markets. It will continue to offer an open access CCP model for cash equity clearing.

By providing clearing solutions across its markets, Euronext will directly manage the clearing of its cash and derivatives trading flows. Euronext Clearing will be positioned as a European clearing house.

Euronext Clearing is therefore building a new system to offer clearing services to the European markets. The content of this document focuses on clearing for cash equities, and aims to provide a technical overview of the new clearing system, which will be released in 2023.

This first version of the document covers the following topics:

- Generic information regarding connectivity;
- Introduction on Application Programming Interfaces (APIs); and
- Introduction on reporting and details on a subset of reports.

Some sections of this document are not yet finalised and will be completed or further clarified in a later version of the document as work on the clearing migration progresses. These sections are:

- Application Programming Interface ;
- List of ;
- ***Error! Reference source not found.***Failover management; and
- Throttling.

1.1 Glossary

This section provides a list of some terms and abbreviations commonly used in this document. Please note that some of these terms are described in more detail in the dedicated sections within this document, or in the associated Euronext Clearing Systems specifications.

- IdP: Identity Provider used by Euronext Clearing to verify the identity of the end users and machine users.
- Client application: application that requests resources from one of the Euronext Clearing services.

- Client Credentials: credentials released by the IdP to the Client to perform the first phase of the machine-to-machine authentication.
- GUI: Graphical User Interface, web interface for end users.
- API: Application Programming Interface.
- Technical User: privileged user in the Client's organisation in charge of managing the Client Credentials.
- JSON: JavaScript Object Notation, textual data format used for communications.
- JWT: Json Web Token, token used to share security information between two parties.
- SSH: Secure Shell, network protocol.
- SFTP: Secured File Transfer Protocol, protocol for file transfer with secured connections.
- PDC: Primary Data Centre.
- SDC: Secondary Data Centre.
- DR: Disaster Recovery site.
- RTO: Recovery Time Objective.

1.2 Overview

The Euronext Clearing systems manage the entire clearing process starting with the collection of market data and ending with the settlement phase.

Clearing Members can interact with the Euronext Clearing system to access clearing data, perform dispositive actions or manage collateral, as well as interacting with the risk management systems to monitor margins and perform simulations. These actions can be carried out through several communication channels.

While providing a common information set, each channel addresses specific use cases and should therefore be deemed complementary to the others.

The following channels are available:

- **Graphical User Interface (GUI) channel:** displays the user's real-time clearing data on a web browser. It also provides dispositive features that enable the Clearing Member to interact with the settlement and collateral management workflows. Additionally, it allows the user to interact with the risk management system for margin calculation and simulations on portfolios. Detailed information on the GUI will be provided in a dedicated User Guide.
- **Application Programming Interface (API) channel**: enables the interoperability of the clearing system with the Clearing Member's own systems. It is based on a machine-to-machine protocol and provides all the informative and dispositive functions that are made available for human users via the GUI. For further details see section 2.1.

- **Secured File Transfer Protocol (SFTP) channel:** allows Clearing Members to retrieve reports generated by the Clearing System. For further details see section 3.3.
- **FIX connection:** provides real-time trade confirmation. For further details see section 3.5.1.

1.3 Authentication and Authorisation

This section explains the authentication method and authorisation procedure for each of the Client Access Points (with the exception of the GUI, which will be detailed in a dedicated User Guide).

1.3.1 API

1.3.1.1 API Manager for Client Credentials

The authentication of end users and machine users is based on the OpenID Connect Protocol which uses the JSON Web Token (JWT).

In order to obtain a JWT for machine-to-machine access, Clearing Members must generate private credentials. The Identity Provider (IdP) needs these private credentials to identify the client's application and return a valid JWT.

The JWT is composed of three parts, separated by a dot:

1. **Header**: specifies the type of the token and the algorithm that is used.
2. **Payload**: the payload contains the claims. There is a set of registered claims, for example: iss (issuer), exp (expiration time), sub (subject), and aud (audience). The payload can also include extra attributes that define custom claims, such as employee role.
3. **Signature**: to create the signature part, the encoded header and encoded payload are signed by using the signature algorithm from the header. The signature is used to verify that the token was not corrupted along the way.

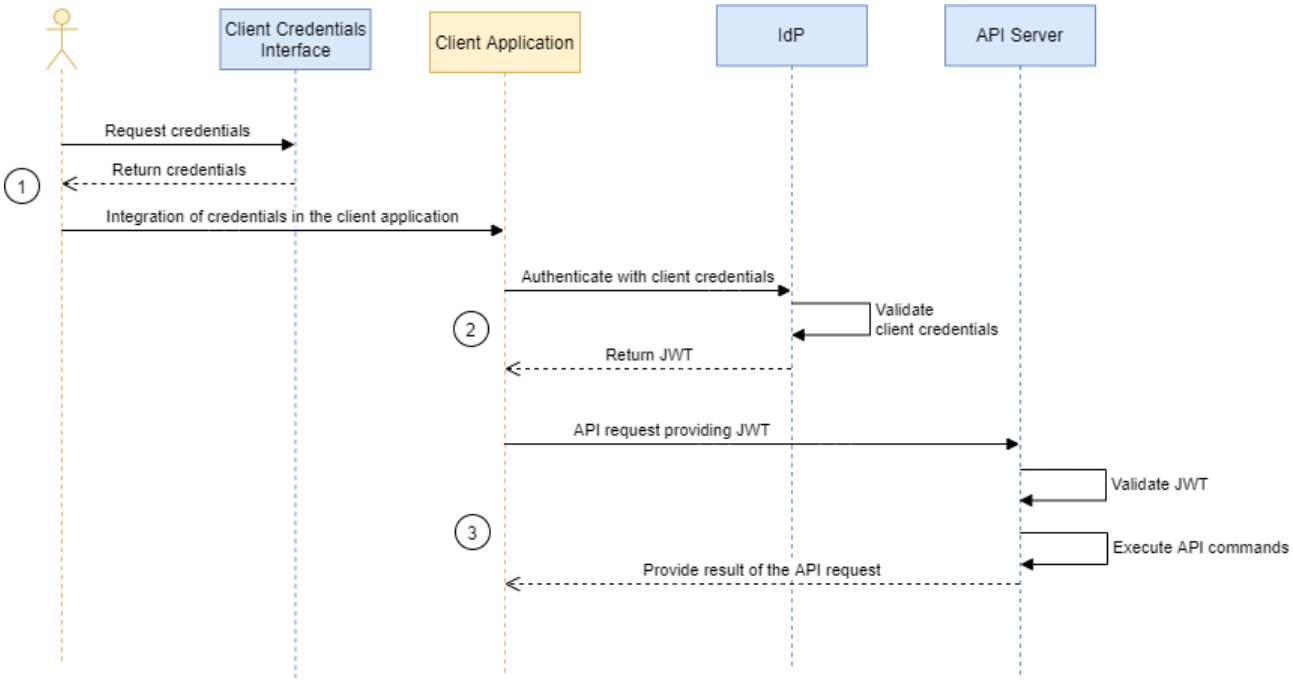
The claims are used to represent an identity and its associations. Euronext Clearing has customised the JWT in order to include claims which specify permissions and the Member Code associated to the users/machine.

Below is an example of a decoded JWT that could be proposed by Euronext Clearing:


```
{
 "ver": 1,
 "jti": "AT.Oxmd9AABJgivAypz9KjIVBL1GqIEGCzSSXL9qztAvmI",
 "iss": "https://euronextclearing.com/oauth2/aus3j5mpv9p0lpqx6417",
 "aud": "eu-core-h2m-audience",
 "iat": 1657197886,
 "exp": 1657198486,
```

```
  "cid": "0oa3j5zmmk03Q1B2p417",
  "uid": "00u3lp7ytdMe8pWge417",
  "scp": [
    "openid",
    "profile"
  ],
  "auth_time": 1657197886,
  "sub": "name.surname@company.com",
  "perms": [
    "auth.margindeltaposition.fetch",
    "auth.margindeltaposition.actions",
    "auth.clientcredentials.fetch",
    "auth.clientcredentials.actions",
    "auth.defaultfundlog.fetch",
    "auth.collateraleligibleinstruments.fetch",
    "auth.collateral.fetch",
    "auth.collateraloperations.cashrestitutionrequest",
    "auth.collateraloperations.securityrestitutionrequest",
    "auth.collateraloperations.sharerestitutionrequest",
    "auth.collateraloperations.uploadrequest",
    "auth.defaultfund.actions",
    "auth.defaultfund.fetch",
    "auth.instruments.fetch",
    "auth.marginamounts.fetch",
    "auth.marginmonitor.actions",
    "auth.marginmonitor.fetch",
    "auth.operations.fetch",
    "auth.participants.fetch",
    "auth.positions.actions",
    "auth.positions.fetch",
    "auth.positionslog.actions",
    "auth.positionslog.fetch",
    "auth.reporting.actions",
    "auth.reporting.fetch",
    "auth.settlementpositions.fetch",
    "auth.simulationengine.actions",
    "auth.simulationengine.fetch",
    "auth.trades.actions",
    "auth.trades.fetch",
    "auth.tradeslog.actions",
    "auth.tradeslog.fetch",
    "auth.virtualportfolio.actions",
    "auth.virtualportfolio.fetch"
  ],
  "mbr": "01030"
}
```


The following diagram shows how Clearing Members generate the client credentials needed to interact with Euronext Clearing Systems:



1. The Client Credentials are generated by the Participant's technical users from the dedicated Client Credentials User Interface. It is assumed by Euronext Clearing that the technical users will be in charge of the management of the credentials on the Client side. At the time of generation, the system will return the values of the client credentials, but will not store them internally. The technical users must store the credentials in a safe place and integrate them in the client application.
2. The credentials must be used each time the authentication has expired; the credentials are validated by the IdP and if the authentication is successful, the IdP returns a JSON Web Token (JWT) with limited duration set by the IdP. Please note that the IdP also provides a refresh token that may be used by the client application to obtain a new JWT when the previous one expires. Details on the refresh mechanism will be provided in a later version of this document.
3. The JWT must be sent at each API call and it will be validated by the API Server. If the validation is successful, the API Server will execute the API commands and return the response to the client application.

The generation of the client credentials only needs to be done once; however, they can be renewed when necessary.

Credentials can be revoked from the Client Credentials Interface by technical users, meaning that the IdP will no longer generate a JWT with these credentials.

The Euronext Clearing Operations team can also manage clients' credentials from a dedicated management interface. Actions that Euronext Clearing Operations can carry out include:

- Deactivation/activation: this action suspends the validity of the credentials temporarily; and
- Revocation: this action deletes the credentials permanently. The IdP will no longer generate a JWT with these credentials.

API credentials are segregated per environment (EUA vs Prod).

1.3.1.2 API Authorisation

After the authentication process, the system performs an authorisation check to verify if the user is allowed to perform the requested command.

All requests that have a valid JWT are analysed by the API Server. Before executing the API request, the server retrieves the information contained in the claims (for more details regarding the JWT structure please refer to section 2.1).

The JWT contains information regarding the membership of the client; this information is used to return only data that belongs to the Clearing Member specified in the JWT. The membership is contained in the *mbr* claim of the JWT.

The API Server checks if the client application has the required permissions needed for the requested operation. If not, the request is rejected. Permissions granted can be Read and/or Write and must be set for each data object (trade, instrument, etc…). The permissions are contained in the *perms* claim of the JWT.

1.3.2 FIX

1.3.2.1 FIX Authentication

This section will be defined in a later version of the document.

1.3.2.2 FIX Authorisation

This section will be defined in a later version of the document.

1.3.3 SFTP

1.3.3.1 SFTP Authentication

Euronext Clearing's SFTP server requires Clearing Members to authenticate using SSH Key Pairs. The client application and the server must use a public key to encrypt messages, while the client application uses a private key to decrypt messages.

When the client application wants to connect to the SFTP Server, it initiates a challenge-response sequence using an SSH Client to authenticate its identity. The server detects the request and sends an encrypted challenge request using the public key. The client application decrypts the server's response using the private key. Then it responds to the server's challenge to receive access.

1.3.3.2 SFTP Authorisation

This section will be defined in a later version of the document.

1.4 Environments

The environments available for Clients are the following:

- EUA (External User Acceptance): environment used by the Clients to carry out integration testing and to verify/accept software.
- Production: environment in which the application is available for business use.

When new releases are planned, the software version of the EUA Environment will be a version ahead of the version currently in use in the Production Environment. If there is no new release planned then the versions remain aligned.

The Disaster Recovery ('DR') environment provides redundant standby systems to be used in the event of the failure of the Production environment.

Connectivity details for the different environments will be provided in a dedicated separate document, to be communicated in due course.

1.4.1 Throttling

Throttling is implemented to regulate traffic by limiting the number of requests from client applications to a given API over a given range of time. In addition, throttling reduces the risk of disruptive events and prevents malicious attacks that aim at overflooding the systems.

The rate limit will be provided in the final version of this document.

1.5 Failover management

1.5.1 Failover management – API Server

In the event of a disruptive incident resulting in the failure of an instance of the API Server, the system will automatically distribute the workload to the other instances available in the same environment and will re-create the failed container. No

additional connectivity set-up is required from the client's application, since the service endpoint of the APIs is the same for each instance.

1.5.2 Failover management – FIX Server

The same failure resiliency mechanism is in place for the FIX Server. In this case, the FIX client must monitor the status of the communication link using a heartbeat message; if the FIX client detects that the FIX server is no longer reachable, the client must establish a new session to the endpoint Unique Resource Identifier (URI).

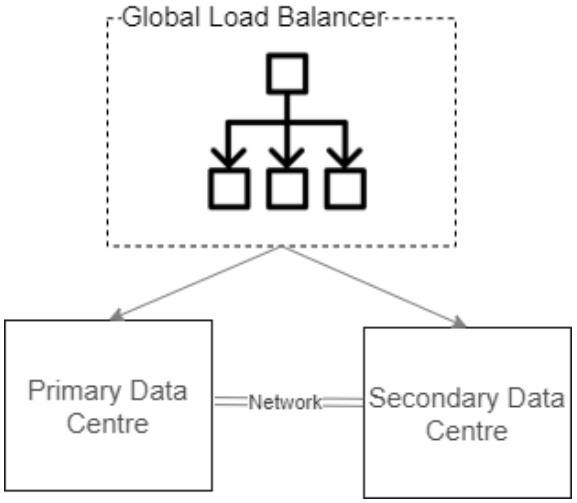
1.5.3 Failover management – SFTP

Failover management for SFTP and the impacts on client connectivity will be detailed in a later version of this document.

1.5.4 Disaster/failover management – Primary Data Centre

In the case of a disaster event affecting the Primary Data Centre (PDC), clients' connectivity to the API Server and FIX Engine will not be impacted, since all requests are received by a Global Load Balancer that dispatches them internally. The Production and Disaster Recovery (DR) environments are continuously replicated, and the DR environment is online in standby mode at all times.

In the case of a failover event, Euronext Clearing services will be provided by the Secondary Data Centre (SDC) and requests will be redirected to that site with no impact on client connectivity.



The disaster recovery procedure has a Recovery Time Objective (RTO) of 2 hours.

2 APPLICATION PROGRAMMING INTERFACE (API)

This section focuses on the APIs and explains their overall functioning. A more detailed overview of the APIs will be shared in a later version of the document.

API actions are grouped into three main types that cover the main use cases:

- Queries: to retrieve data from the Clearing System
- Subscriptions: to activate real-time data flows
- Mutations: to interact with the Clearing System with dispositive actions.

All the APIs that execute queries allow the user to filter data according to different fields and to sort the results based on several criteria.

2.1 API Overview

The APIs are publicly exposed on the Internet and can be reached at a defined URL. The APIs are developed using the GraphQL Query Language. GraphQL is a query language for APIs and a runtime for fulfilling queries on the data source.

A GraphQL API has a single entry point instead of multiple resource addresses. Through the same API connection, Clearing Members will be able to retrieve reports, query the warehouse database and perform dispositive actions.

GraphQL allows the client application to specify the data required; the server will return exactly the data requested by the client application. This prevents under-fetching or over-fetching. Data is returned in JavaScript Object Notation (JSON), the textual data format used for communications.

GraphQL protocol is widely used and related libraries are freely available for the most common programming language.

The following is a non-exhaustive list of information handled by the APIs:

- **Instruments:** clients can retrieve, in real time, referential data on instruments that have been sent by the trading market to the CCP and have been successfully processed.
- **Trades:** clients can retrieve, in real time, the trades that have been sent by the trading market to the CCP and have been successfully processed. It is possible to restore historical data that has been archived.
- **Positions:** clients can retrieve the positions generated by the CCP through the allocation of Trades to the Position Accounts and access position history.
- **Margins:** clients can retrieve the margins generated by the Risk Management System through the margin calculation.
- **Collateral:** clients can view posted collateral, cash, securities and concentration limits. Additional APIs allow collateral management to be performed through dispositive actions.

- **Simulations:** clients can interact with the Risk Management System and perform a broad set of tests and simulations on portfolios with enhanced performances.
- **Settlement:** clients can retrieve information on settlement instructions generated by the Clearing House.
- **Reporting:** clients can request, receive and save reports. Clients can create their own reports by interfacing their systems directly with the APIs to ensure smooth and personalised operations.

Clearing Members can obtain credentials for API access as described in section 1.3.1.1. Once the Clearing Member has obtained its API credentials and installed them on its own systems, the Clearing Member can implement and deploy IT processes that can interoperate with the Euronext Clearing system.

2.1.1 Queries

The complete list of APIs will be provided in a later version of this document.

An example of a query is provided below. Please note that the types and fields are still under revision.

Request:

```
query ListTrades {
  listTrades {
    msg_code
    msg_sequence
    trade_id
    position_id
    mbr
    gcm
    agent
    acct
    trade_dt
    trade_tm
    isin
    qty
    market_price
    mic
    mkt_group
    trade_numb
    sign
    ctv
    accr_int
    settle_dt
    trade_type
    repo_rate
    trade_status
    haircut
    curr_exch_rate
    settle_curncy
    coeff_index
    crud
```

```
  }
}
```

Response:


```
{
  "data": {
    "listTrades": [
      {
        "msg_code": "300",
        "msg_sequence": 5922,
        "trade_id": "0001A4812B773432AF24227CD7BD8655C6B21464",
        "position_id": "E670445886619B622833239AF8F8D9485E823800",
        "mbr": "01030",
        "gcm": "01030",
        "agent": "01030",
        "acct": "H",
        "trade_dt": 20220330,
        "trade_tm": 170715,
        "isin": "IT0005321325",
        "qty": 2000000,
        "market_price": 122.83,
        "mic": "MTSC",
        "mkt_group": "BWSL",
        "trade_numb": "0000402260",
        "sign": "S",
        "ctv": 2456600,
        "accr_int": 4970.2,
        "settle_dt": 20220401,
        "trade_type": "C",
        "repo_rate": 0,
        "trade_status": "T",
        "haircut": 0,
        "curr_exch_rate": 1,
        "settle_curncy": "EUR",
        "coeff_index": 0,
        "crud": "I"
      },
      {
        "msg_code": "300",
        "msg_sequence": 7310,
        "trade_id": "0006F331EBC4E7BDB4B8AF51774BE0F5A5BC1685",
        "position_id": "DE227B21B4035C3E50B0B0CFF49927F9793231A5",
        "mbr": "01030",
        "gcm": "01030",
        "agent": "01030",
        "acct": "H",
        "trade_dt": 20220105,
        "trade_tm": 81411,
        "isin": "IT0004848831",
        "qty": 15000000,
        "market_price": 106.557,
        "mic": "EBMX",
        "mkt_group": "BWSL",
        "trade_numb": "0000401016",
        "sign": "S",
        "ctv": 15983550,
        "accr_int": 152694,
        "settle_dt": 20220107,
        "trade_type": "C",
```

```
        "repo_rate": 0,
        "trade_status": "T",
        "haircut": 0,
        "curr_exch_rate": 1,
        "settle_curncy": "EUR",
        "coeff_index": 0,
        "crud": "I"
      }
    ]
  }
}
```


2.1.2 Mutations

The complete list of APIs will be provided in a later version of this document.

An example of a mutation is provided below. Please note that the types and fields are still under revision.

Request:

```
mutation SubmitTradesHistoricalRequest($input: DateAsInput!) {
  submitTradesHistoricalRequest(input: $input) {
    disposal_id
    msg_code
    mbr
    gcm
    agent
    user_id
    created_at_tmsp
    modified_at_tmsp
    status
    err_code
    err_desc
    crud
    date_from
    date_to
  }
}

{
  "input": {
    "date": 20220101
  }
}
```

Response:


```
{
  "data": {
    "submitTradesHistoricalRequest": {
      "disposal_id": "1D06353ACE4D44B0AA11C99083423A7B",
      "msg_code": "D300",
      "mbr": "01030",
      "gcm": "01030",
      "agent": "01030",
      "user_id": "name.surname@company.com",
      "created_at_tmsp": "20220714T072449Z",
```

```
      "modified_at_tmsp": "20220714T072449Z",
      "status": "L",
      "err_code": null,
      "err_desc": null,
      "crud": "I",
      "date_from": 20220106,
      "date_to": 20220106
    }
  }
}
```


2.1.3 Subscription management

The complete list of APIs will be provided in a later version of this document.

An example of subscription is provided below. Please note that the types and fields are still under revision.

Request:

```
subscription OnTradesHistoricalRequestsFeed {
  onTradesHistoricalRequestsFeed {
    member
    input {
      disposal_id
      msg_code
      mbr
      gcm
      agent
      user_id
      created_at_tmsp
      modified_at_tmsp
      status
      err_code
      err_desc
      crud
      date_from
      date_to
    }
  }
}
```

Responses through which the client application receives updates regarding the request status:


```
// Response received at 09:24:48
{
  "data": {
    "onTradesHistoricalRequestsFeed": {
      "member": "01030",
      "input": [
        {
          "disposal_id": "1D06353ACE4D44B0AA11C99083423A7B",
          "msg_code": "D300",
          "mbr": "01030",
          "gcm": "01030",
          "agent": "01030",
```

```
        "user_id": "name.surname@company.com",
        "created_at_tmsp": "20220714T072449Z",
        "modified_at_tmsp": "20220714T072449Z",
        "status": "L",
        "err_code": null,
        "err_desc": null,
        "crud": "I",
        "date_from": 20220106,
        "date_to": 20220106
       }
      ]
     }
    }
}
// Response received at 09:24:49
{
  "data": {
    "onTradesHistoricalRequestsFeed": {
      "member": "01030",
      "input": [
       {
        "disposal_id": "1D06353ACE4D44B0AA11C99083423A7B",
        "msg_code": "D300",
        "mbr": "01030",
        "gcm": "01030",
        "agent": "01030",
        "user_id": "name.surname@company.com",
        "created_at_tmsp": "20220714T072449Z",
        "modified_at_tmsp": "20220714T072449Z",
        "status": "H",
        "err_code": null,
        "err_desc": null,
        "crud": "U",
        "date_from": 20220106,
        "date_to": 20220106
       }
      ]
     }
    }
}
```

3 REPORTING

Member Reports provide a snapshot of clearing data taken at relevant moments in the open market day, in a structured format that can be read by both human users and automated systems.

3.1 Reporting Overview

Euronext Clearing will report updated and comprehensive information to Clearing Members on trades executed and all related clearing data, including risk and collateral management reports.

Reports will be available in the following formats:

- Machine readable: CSV and XML.
- Human readable: CSV, XML and XLSX.

The CCP will provide a set of mandatory reports in machine and human readable formats. These reports will be available through APIs, SFTP, GUI or FIX messages for the drop copies.

On client request, Euronext Clearing can create recurring or one-time reports for specific needs. These reports will be available via APIs, SFTP and on the web portal in the dedicated access section of the member who issued the request.

Reports are available for clients automatically at end of day and/or intraday, depending on the report's periodicity.

Available reports cover the following main categories:

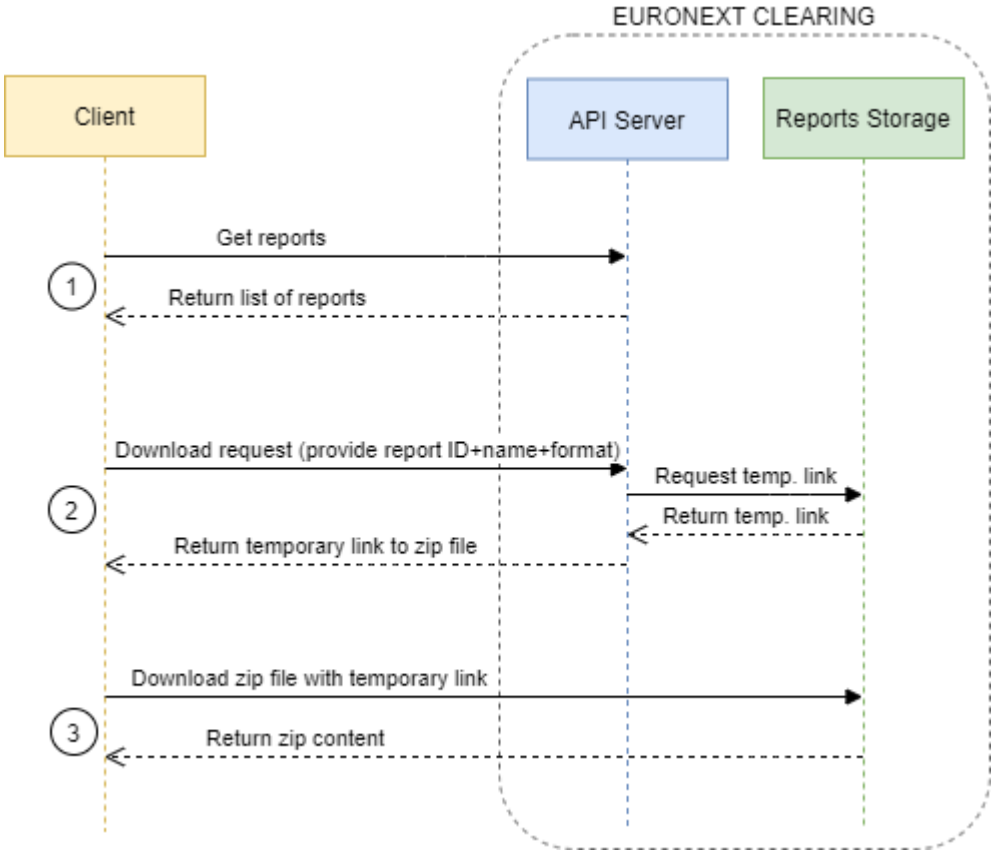
- Trade legs;
- Open positions (including fails);
- Settlement instructions (including fails);
- Buy-In information;
- Margin calculation and margin calls;
- Collateral posted;
- Default Fund contributions;
- CSDR Penalties;
- Payments; and
- Fees.

The following table shows the suite of reports that will be delivered. This version of the specifications contains details only on the reports identified by numbers 1, 2, 3, 4 and 7:

	1 Trade legs	2 Open Positions	3 Settlement instruction (incl. Fails)	4 Buy-in	5 Margin calculation & Margin call	6 Collateral	7 Default fund	8 CSDR Penalties	9 Payments	10 Fees
Scope	*Trade confirmation*	*All positions with value and quantity*	*Details of settlement instructions and pair-offs*	*Buy-In triggered on Failed instructions*	*Margin components and margin positions account, Margin call amounts*	*Collateral*	*Default fund contribution, cash call and quota calculation*	*Penalties imposed by CSDs*	*Breakdown report detailing the components and respective amounts*	*Clearing, fails, Buy-In and service fees*
Frequency	Real time End of Day	End of Day Intra-day	End of Day	End of Day	Intra-day End of Day	Intra-day End of Day	Intra-day End of Day	End of Day Monthly	Intra-day End of Day	Monthly

3.2 Report download via API

The following diagram shows how Clearing Members can retrieve the reports using the APIs:



To download the reports using the APIs the Client must follow these steps:

1. The client application calls the API Server to retrieve the IDs of the reports available for the Clearing Member for which the client application operates. The API has different filters and sorting parameters. The server returns the requested list of report IDs.
2. The client application calls the download API, specifying ID, name and format for the desired reports. The server returns a temporary link that identifies the file produced by the backend containing all the reports requested. The output is a .zip file. The links are valid for 2 minutes.
3. The client application uses the temporary link to download the .zip file.

In order to retrieve the reports via API, the client application must first follow the authentication and authorisation flow described in section 1.3.1.

3.3 Report retrieval via SFTP

Clearing Member reports are also available via the Euronext Clearing SFTP Server. Secure File Transfer Protocol (SFTP) works over the Secure Shell (SSH) data stream to establish a secure connection and provide organisations with a higher level of file transfer protection.

After the SSH authentication process explained in section 1.3.3.1, the client application can send requests for a file transfer from a specific directory. The SFTP Server then starts sending the file over the secured tunnel established by the SFTP network protocol.

3.4 Report retrieval via FIX

The Real Time Trade Confirmation report, detailed in section 3.5.1, is provided to the Clearing Member via the FIX Protocol. Clearing Members that wish to retrieve the Real Time Trade Confirmation report via FIX open a connection towards the Euronext Clearing FIX Engine; each time Euronext Clearing confirms a trade, a trade confirmation message is sent through the connection established.

Please note that the Real Time Trade Confirmation report is also provided via API. In this case, the format will not follow the FIX structure but will be aligned with the formats for all other reports.

3.5 List of reports

Complete lengths and types of reports will be provided in a later version of this document.

3.5.1 Real Time Trade Confirmation

Purpose: Provides all transactions validated by the clearing house for use by the Clearing Member for trade reconciliation and position exposure. Please note that another report will be issued at the end of the day, listing all trade legs with Euronext Clearing settlement reference.

Frequency: Real time.

Tag	Field Name	Format	Description
1	Account	_	Client/house indicator and position Account ID.
14	CumQty	_	Always equal to LastQty.
15	Currency	_	Currency in which the security is traded. The clearing currency always matches the trading currency. Format is 'EUR', 'GBP', etc.
17	ExecID	_	An unique identifier of execution message as assigned by the Trading platform. The identifier must start with an B or S indicator (Buy or Sell). In case of a cancellation by the exchange on T0 the ExecID contains a reference to the ExecID of the original Execution Report preceded by '1'. If the cancellation of the trade occurs after T0 (T+1, etc.) then the ExecID of the reverse trade will be different. In this case, the ID of the trade cancelled will be retrieved in the 'ExecRefID'.
19	ExecRefID	_	Mandatory in the case of a trade cancellation message (ExecTransType = 1). Gives the ExecID of the trade cancelled.
29	LastCapacity	_	1 = Agent 4 = Principal
31	LastPx	_	Price of securities bought or sold on this fill.
32	LastQty	_	Quantity of shares bought or sold on this fill. If ExecTransType <> '1' (Cancellation), then LastQty from FIX-message will be filled with the quantiy (number) bought or sold by the trading member. If ExecTransType = '1' (Cancellation) and the trade date is >T0, then it is automatically filled with the opposite number of shares sold / bought by the trading member.
37	OrderID	_	A unique identifier of the order created by the exchange.
38	OrderQty	_	Always equal to LastQty. Represents the number of shares for equities or par, face or nominal value for FI Instruments.
39	OrdStatus	_	Always set to 2 ('filled').
22	SecurityIDsource	_	Value is '4' to use ISINs as SecurityID.
48	SecurityID	_	ISIN of the security traded.
54	Side	_	1 = Buy; 2 = Sell; D = Subscribe; and E= Redeem.
55	Symbol	_	Symbol of the security traded.
58	Text	_	Used to provide the Euronext Clearing settlement reference of the order when possible (the 3 last characters can change in case the

			netting is unwound and replaced with 2 aggregations. The final settlement reference will be provided in the EOD trade leg report)
60	TransactTime	_	FORMAT: YYYYMMDD-HH:MM:SS UTC time zone
150	ExecType	_	Filled with Value 'F' or 'H' for trade cancellation
151	LeavesQty	_	Must have value of 0 (zero)
207	SecurityExchange	_	MIC of the MTF / exchange where the trades was made.
375	ContraBroker	_	'Empty' for guaranteed trade. This is use only to specify the counterpart to a non-guaranteed trade.
382	NoContraBrokers	_	Must have value of 1.
452	PartyRole	-	3 = Client ID.
448	PartyID	-	Filled with the unique ID of the Clearing Firm.
539	NoNestedPartyIds		Number of NestedPartyID entries: identifies the repeating group.
524	NestedPartyID		Filled with the unique ID of the Clearing Firm ID
525	NestedPartyIDSource		D = Proprietary / Custom code
539	NestedPartyRole		4 = Clearing Firm
2384	NestedPartyRoleQualifier		3 = General clearing member 4 = Individual clearing member
63	SettlmntTyp	_	Filled with Value '3' which stands for T+2.

3.5.2 Open positions

Purpose: Provides all aggregated opened positions according to aggregation rules defined at Position Account level, including failed positions.

Frequency: End of Day.

Field Name	Length	Type	Values	Descriptions
Version	-	-		Indicates the progressive version of the run that produced the report.
Clearing Member	-	-		Clearing Member Code.
Member Code	-	-		Corresponds to the code of the Clearing Member or Trading Member owning the position.
Position Account ID	-	-		Identification code for the Position Account containing the position(s).
Position ID	-	-	Position numeric incremental	Identification code created for each specific position.
Margin Account ID	-	-		Informational - Margin Account associated to the Position Account.

Account Category	-	-	C = Client H = House LP = Liquidity Provider F = Fails	
ISIN Code	12	A		
Trade Date	10	T	Format yyyy-MM-dd	
Intended Settlement Date	10	T	Format yyyy-MM-dd	
End of Validity Date	10	T	Format yyyy-MM-dd	End of extension period. Buy-In process is triggered.
Side	-	-	B = Buy S = Sell	Indicates if the Clearing Member Buys or Sells securities.
Positions Quantity	-	-		Positive values represent long securities positions (CM buys securities). Negative values represent short securities positions (CM sells securities) Represents remaining quantity in case of partial settlement (fails are reported in the original PA or in a dedicated fails PA).
Quantity Type	1	A	U = Unit or F = Face Value	
Positions Amount	-	-		Cash amount of the position (including Accrued interest when relevant). - Positive values Clearing Member is creditor - Negative values Clearing Member is debitor Remaining amount in case of partial settlement (reported in the original PA or in the dedicated fails PA).
Currency	3	A	ISO code for the currency	
Accrued Interest	-	-		Informational.
Market Venue	4	A	VARI if netting cross trading venue or ALXB EURONEXT GROWTH BRUSSELS ALXP EURONEXT GROWTH PARIS XESM EURONEXT GROWTH DUBLIN ALXL EURONEXT GROWTH LISBON	This field is filled in with the MIC code of the trading venue when it is a SME growth market. For the other Euronext markets, since the netting is cross trading venues, the field is filled with "VARI".
Position source	-	-		Position from trading Position from Corporate Actions. (Claims, transformation) Position from buyer protection.
ENXC Settlement Reference	16	A		Settlement reference sent by Euronext Clearing to the (I)CSD.
MITI	-	-		Market Infrastructure Transaction Identification: the unique reference

				allocated by T2S or Euroclear Bank to the Settlement Instruction.
(I)CSD	11	A	BIC code	BIC code of the CSD where the Clearing Member/Settlement Agent holds its related settlement account.
Main depository	-	-	Euroclear France - 00001 Euroclear Belgium - 00002 Euroclear Nederland - 00003 Euronext Securities Porto - 00010 NBB-SSS - 00004 Euroclear Bank -00006	Main depository of the instrument.
Last Update Date & Time	-	-	Format yyyy-MM-dd-hh.mm.ss (ex: 2018-07-27-15.30.00)	
Status Indicator	-	-	Empty or "F" if instruction is failing	

3.5.3 Settlement Instructions

Purpose: Provides all net Settlement instructions generated by Euronext Clearing, including fails.

Frequency: End of Day.

Field Name	Length	Type	Values	Description
Version	-	-		Indicates the progressive version of the run that produced the report
Clearing Member	-	-		Clearing Member Code
Settlement Agent	-	-		Settlement Agent Code
Delivery Account ID	-	-		Corresponds to the Delivery Account on Euronext Clearing side
Settlement Account ID	35	A		Corresponds to the settlement Account on (I)CSD side
Fail Position Account ID				Only used when SI is failing
Position ID	-	-	Position numeric incremental	Identification code created for each specific position
ISIN Code	12	A		
Trade Date	10	T	Format yyyy-MM-dd	
Intended Settlement Date	10	T	Format yyyy-MM-dd	T+2
Buy-In Alert Date	10	T		extension date - 2 business days
End of Validity Date	10	T	Format yyyy-MM-dd	End of extension period. Buy-In process is triggered

Side	-	-	B = Buy S = Sell	Indicates if the Clearing Member Buys or Sells securities
Original QTY	-	-		- Positive value represents long securities positions (CM/SA receives securities) - Negative value represents short securities positions (CM/SA delivers securities)
Quantity Type	-	-	U = Unit or F = Face Value	
Original Amount	-	-		- Positive values CM/SA is creditor - Negative values CM/SA is debitor
Currency	3	A	ISO code for the currency	
Unsettled Quantity	-	-		- Equal to original quantity if no settlement has occured yet - Different to original quantity if partial settlement has occured - Equal to 0 if position is fully settled - Positive value represents long securities positions (CM/SA receives securities) - Negative value represents short securities positions (CM/SA delivers securities)
Unsettled Amount	-	-		- Equal to original amount if no settlement has occured yet - Different to original amount if partial settlement has occured - Equal to 0 if position is fully settled - Positive values CM/SA is creditor - Negative values CM/SA is debitor
Hold & Release Indicator	-	-		hold/release indicator of the original Settlement instruction
Previous EURONEXT Clearing Settlement References	16	A		previous Euronext Clearing Settlement reference in case of cancellation
EURONEXT Clearing References	16	A		Settlement reference sent by Euronext Clearing to the (I)CSD
MITI	-	-		Market Infrastructure Transaction Identification: the unique reference allocated by T2S or Euroclear Bank to the Settlement Instruction
Settlement Instruction Source	-	-		- SI from Trading - SI from Corporate Actions (claims, transformation) - SI from buyer protection - SI from pair-off - SI from split
Settlement platform	-	-		T2S or EB
(I)CSD	11	A	BIC code	BIC code of the CSD where Clearing Member/Settlement Agent holds its related settlement account

Main depository	-	-	- Euroclear France - 00001 - Euroclear Belgium - 00002 - Euroclear Nederland - 00003 - Euronext Securities Porto - 00010 - NBB-SSS - 00004 - Euroclear Bank -00006	Main depository of the instrument
Market Venue	4	A	- VARI if netting cross trading venue or - ALXB EURONEXT GROWTH BRUSSELS - ALXP EURONEXT GROWTH PARIS - XESM EURONEXT GROWTH DUBLIN - ALXL EURONEXT GROWTH LISBON	this field is filled in with the MIC code of the trading venue when it is a SME growth market. For the other Euronext markets, since the netting is cross trading venues, the field is filled in with "VARI"
Last Update Date & Time	-	-	Format yyyy-MM-dd-hh.mm.ss (ex: 2018-07-27-15.30.00)	
Status indicator	-	-	- F for failed - C for cancelled - Empty if not F or C	Status of the Settlement Instruction
CA type	4	A	Indicates the CA event type from the CAEV field from the CSD	Relevant when SI source is a corporate action/buyer protection.
CA ref	16	A	Indicates the CA reference from the COAF field from the CSD	Relevant when SI source is a corporate action/buyer protection.
CA information	4	A	Indicates if it is a transformation or a claim	Relevant when SI source is a corporate action/buyer protection.

3.5.4 Buy-in notice

Purpose: Inform seller that the Buy-In procedure is triggered for failed and partially settled instructions (Buy-In notice or alerts will also be provided to the buyer(s). Related report(s) will be described in the next version).

Frequency: Sent at End of Day or End of validity period.

Field Name	Length	Type	Values	Description
Version	-	-		Indicates the progressive version of the run that produced the report.
Clearing Member	-	-		Clearing Member Code.
Settlement agent	-	-		Settlement Agent Code.
Delivery Account ID	-	-		Corresponds to the Delivery Account on Euronext Clearing side.

Settlement Account ID	35	A		Corresponds to the settlement Account on (I)CSD side.
Fail Position Account ID	-	-		Original position account ID or failed position account when applicable.
Position ID	-	-	Position numeric incremental	Identification code created for each specific position.
ISIN Code	12	A		
Trade Date	10	T	Format yyyy-MM-dd	
Intended Settlement Date	10	T	Format yyyy-MM-dd	
End of Validity Date	10	T	Format yyyy-MM-dd	End of extension period. Buy-In process is triggered.
(I)CSD	11	A	BIC code	BIC code of the CSD where Clearing Member/Settlement Agent holds its related settlement account.
Main depository	-	-	Euroclear France - 00001 Euroclear Belgium - 00002 Euroclear Nederland - 00003 Euronext Securities Porto - 00010 NBB-SSS - 00004 Euroclear Bank -00006	Main depository of the instrument.
Side	-	-	B = Buy S = Sell	Indicates if the Clearing Member Buys or Sells securities .
Original QTY	-	-		Positive value represents long securities positions (CM/SA receives securities). Negative value represents short securities positions (CM/SA delivers securities).
Quantity Type	-	-	U = Unit or F = Face Value	
Original Amount	-	-		Positive values CM/SA is creditor. Negative values CM/SA is debitor.
Currency	3	A	ISO currency code	
Unsettled Quantity	-	-		Equal to Original quantity if no settlement has occurred yet. Different than Original quantity if partial settlement has occurred. Equal to 0 if position is fully settled. Positive value represents long securities positions (CM/SA receives securities). Negative value represents short securities positions (CM/SA delivers securities).

Unsettled Amount	-	-		Equal to Original amount if no settlement has occurred yet. Different than Original amount if partial settlement has occurred. Equal to 0 if position is fully settled. Positive values CM/SA is creditor. Negative values CM/SA is debitor.
Fail reason	-	-		Status of the settlement instruction (lack of securities, on hold, etc.).
EURONEXT Clearing Settlement Reference	16	A		Settlement reference sent by Euronext Clearing to the (I)CSD.
MITI	-	-		Market Infrastructure Transaction Identification: the unique reference allocated by T2S or Euroclear Bank to the Settlement Instruction.
Settlement Instruction Source	-	-		SI from TDN process. SI from Corporate Actions (Claims, transformation). SI from buyer protection. SI from pair-off. SI from split.
Settlement platform	-	-		T2S or EB
Market Venue	4	A	Venue MIC code: VARI if netting cross trading venue or ALXB EURONEXT GROWTH BRUSSELS ALXP EURONEXT GROWTH PARIS XESM EURONEXT GROWTH DUBLIN ALXL EURONEXT GROWTH LISBON	this field is filled in with the MIC code of the trading venue when it is a SME growth market. For the other Euronext markets, since the netting is cross trading venues, the field is filled in with "VARI".
Last Update Date&Time	-	-	Format yyyy-MM-dd-hh.mm.ss (ex: 2018-07-27-15.30.00)	

3.5.5 Buy-in Results Information

Purpose: Provides results information to the seller involved in the Buy-In process (Cash Compensation report will be described in the next version).

Frequency: End of Day on the day on which Buy-In occurred.

Field Name	Length	Type	Values	Description
Version	-	-		Indicates the progressive version of the run that produced the report.
Clearing Member	-	-		Clearing Member Code.
Settlement agent	-	-		Settlement Agent Code.
Delivery Account ID	-	-		Corresponds to the Delivery Account on Euronext Clearing side.

Settlement Account ID	35	A		Corresponds to the settlement Account on (I)CSD side.
Fail Position Account ID	-	-		Original position account ID or failed position account when applicable.
Position ID	-	-	Position numeric incremental	Identification code created for each specific position.
ISIN	12	A		
Trade Date	10	T	Format yyyy-MM-dd	
Intended Settlement Date	10	T	Format yyyy-MM-dd	
End of Validity Date	10	T	Format yyyy-MM-dd	End of extension period. Buy-In process is triggered.
(I)CSD	11	A	BIC code	BIC code of the CSD where Clearing Member/Settlement Agent holds its related settlement account.
Main depository	-	-	Euroclear France - 00001 Euroclear Belgium - 00002 Euroclear Nederland - 00003 Euronext Securities Porto - 00010 NBB-SSS - 00004 Euroclear Bank -00006	Main depository of the instrument.
Side	-	-	B = Buy S = Sell	Indicates if the Clearing Member Buys or Sells securities.
Original Quantity	-	-		Positive value represents long securities positions (CM/SA receives securities). Negative value represents short securities positions (CM/SA delivers securities).
Quantity Type	-	-	U = Unit or F = Face Value	
Original Amount	-	-		Positive values CM/SA is creditor. Negative values CM/SA is debitor.
Currency	3	A	ISO currency code	
Quantity delivered	-	-		Quantity already delivered before Buy-In. Positive value represents long securities positions (CM/SA receives securities). Negative value represents short securities positions (CM/SA delivers securities).
Amount delivered	-	-		Amount delivered before Buy-In. Positive values CM/SA is creditor. Negative values CM/SA is debitor.
Quantity purchased through Buy-In	-	-		Actual quantity purchased through the Buy-In process.
Countervalue of Buy-In execution	-	-		Countervalue quantity purchased through Buy-In.

Trading Fees				Trading Fees amount from the Buy-In Agent.
Execution Date	10	T		
Settlement Date	10	T		
Cash Differential	-	-		Positive values CM/SA is creditor. Negative values CM/SA is debitor (when Buy-In price is higher than original price).
Remaining quantity to be delivered submitted to cash compensation	-	-		In case the total failing quantity could not be fully purchased in the Buy-In process (note that a dedicated Cash Compensation report will be produced). Positive value represents long securities positions (CM/SA receives securities). Negative value represents short securities positions (CM/SA d.elivers securities)
Fail reason	-	-		Status of the settlement instruction (lack of securities, on hold, etc.).
ENXC Settlement Reference	16	A		Settlement reference sent by Euronext Clearing to the (I)CSD
MITI	-	-		Market Infrastructure Transaction Identification: the unique reference allocated by T2S or Euroclear Bank to the Settlement Instruction
Settlement Instruction Source	-	-	Value to be provided later	SI from TDN process. SI from Corporate Actions (Claims, transformation). SI from buyer protection. SI from pair-off. SI from split.
Settlement platform	-	-		T2S or EB.
Market Venue	4	A	Venue MIC code: VARI if netting cross trading venue or ALXB EURONEXT GROWTH BRUSSELS ALXP EURONEXT GROWTH PARIS XESM EURONEXT GROWTH DUBLIN ALXL EURONEXT GROWTH LISBON	This field is filled with the MIC code of the trading venue when it is a SME growth market. For the other Euronext markets, since the netting is cross trading venues, the field is filled with "VARI".
Last Update Date & Time	-	-	Format yyyy-MM-dd-hh.mm.ss (ex: 2018-07-27-15.30.00)	

3.5.6 Default Fund Contribution

Purpose: Provides information on required contribution to default Fund at GCM level.

Frequency: At least Monthly.

Field Name	Length	Type	Values	Description
Version	-	-		Indicates the progressive version of the run that produced the report.
Clearing Member	-	-		Clearing Member Code.
DF Account ID	-	-		
Average Margin	-	-		Average margin at GCM level for 20 sliding working days.
Variable contribution	-	-		Delta of the contribution (difference between required contribution and already posted collateral).
Minimum contribution	-	-		minimum contribution quota for the specific DF Account ID.
Required contribution	-	-		Contribution that is needed based on the calculation.
Posted Collateral	-	-		Contribution already posted.
Excess Cash	-	-		If the required contribution is less than the posted collateral (Money Euronext Clearing owes to the Clearing Member).
DF Call	-	-		If required contribution is more than the already posted collateral OR if the posted collateral is below the minimum contribution (Cash call).
Currency	-	-	ISO currency code	
Period start	-	-	Format yyyy-MM-dd (ex: 2018-07-27)	20 sliding working days.
Period End	-	-	Format yyyy-MM-dd (ex: 2018-07-27)	20 sliding working days.

3.5.7 Default Fund Quota

Purpose: Provides breakdown details of default fund contribution per Margin account.

Frequency: At least monthly.

Field Name	Length	Type	Values	Description
Version	-	-		Indicates the progressive version of the run that produced the report.
Clearing Member	-	-		Clearing Member Code.
DF Account ID	-	-		
Margin Account ID	-	-		
Average Margin per Margin Account	-	-		Average margin value used to calculate the participant Default Fund quota.

Currency	-	-		ISO currency code.
Average Margin per Member	-	-		Sum of Average Margin per Margin account calculated for the Clearing member.
Total Average all CCP Members	-	-		Total average margin for all Members of the CCP (sum of calculated average for each margin account).
Percentage Average Member	-	-		Ratio between average initial margin of the receiver CM vs All GCMs of the CCP.
DF Total Amount	-	-		Default Fund amount calculated defined by the risk management team.
Contribution Calculation	-	-		Ratio applied to the DF Total Amount.
Contribution Amount	-	-		Rounding value of contribution calculation.
Period start	-	-	Format yyyy-MM-dd(ex: 2018-07-27)	20 sliding working day for now.
Period End	-	-	Format yyyy-MM-dd(ex: 2018-07-27)	20 sliding working day for now.

3.5.8 Default fund calculation details

Purpose: Provides breakdown of Default Fund calculated daily per margin account.

Frequency: Monthly.

Field Name	Length	Type	Values	Description
Version	-	-		Indicates the progressive version of the run that produced the report.
Clearing Member	-	-		Clearing Member Code.
DF Account ID	-	-		
Margin Account ID	-	-		
Margin date	-	-	Format yyyy-MM-dd(ex: 2018-07-27)	
Margin	-	-		
Currency	-	-	ISO currency code	
Business Days	-	-		
Period start	-	-	Format yyyy-MM-dd(ex: 2018-07-27)	Period to be defined.
Period End	-	-	Format yyyy-MM-dd(ex: 2018-07-27)	Period to be defined.

SUPPORT

For support relating to this document or with the clearing migration, please contact:
ccp-sales@euronext.com