Euronext Market Outage Plan

EURONEXT REGULATED MARKETS

DECEMBER 2024

DOCUMENT SUMMARY

Document type	Outage Plan
Purpose of the document	Provide transparency and certainty to participants on how Euronext platforms will be managed during a severe market incident
Classification	External

Version Control

REVISION NO./ VERSION NO.	DATE	CHANGE DESCRIPTION
01	11-02-2022	Initial version
02	04-12-2024	Updated according to the ESMA Outages report released in April 2023

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Table of Contents

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Introduction

In the dynamic landscape of financial markets, the uninterrupted functioning of trading venues is paramount to ensure fair and efficient market operations. Nevertheless, unforeseen events such as technical glitches, cyber-attacks, or natural disasters can disrupt the normal functioning of trading platforms.

In response to these challenges, and with the aim of maintaining the integrity of financial transactions, Euronext has developed its Market Outage Plan. This plan offers market participants a structured and standardised framework to effectively manage and navigate through such crises, with the ultimate goal of minimising the impact of disruptions on market participants. This plan was previously known as the 'Euronext Incident Management Playbook' and was available in the IT Documentation section of the Euronext Customer portal.

As recommended by the European Securities and Markets Authority (ESMA) in its final report on Market Outages and in accordance with the requirement to periodically review business continuity arrangements outlined in Article 17 of RTS 7, this document, referred to as the 'Euronext Market Outage Plan,' undergoes a comprehensive review every two years.

Euronext remains committed to continuously enhancing its Market Outage Plan to ensure the security of a reliable, robust, stable, and resilient infrastructure. While operational procedures during an incident may vary based on the nature, the impacts and the complexity of the incident, these procedures are designed to provide greater transparency and certainty to participants regarding how Euronext platforms will be managed during such events.

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1. A trading system resilient by design

The Euronext trading system (Optiq®) is engineered with advanced technologies, and built on a segregated, geographically distributed and redundant architecture, to mitigate potential disruption and maintain continuous trading activities as much as possible.

Segregation

The trading platform is split into two asset classes (cash and derivatives), covering seven segments in all. Segments are made up of one or more partitions, each partition being split into logical cores (corresponding to groups of instruments).

This segregation limits the propagation and impact of any potential issues.
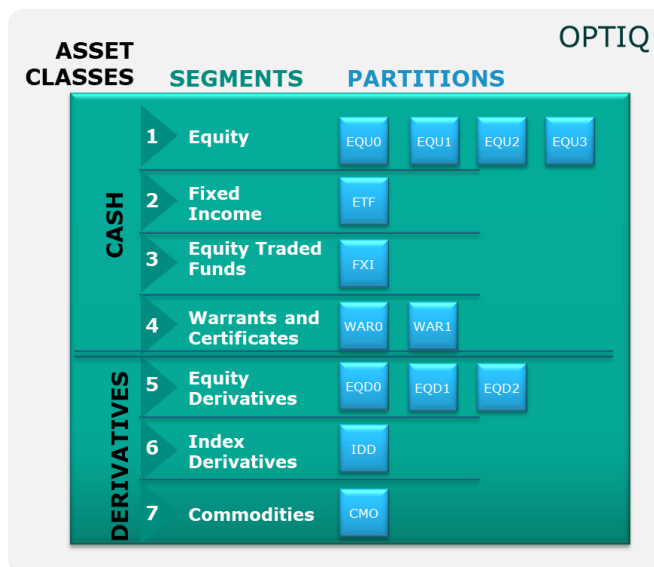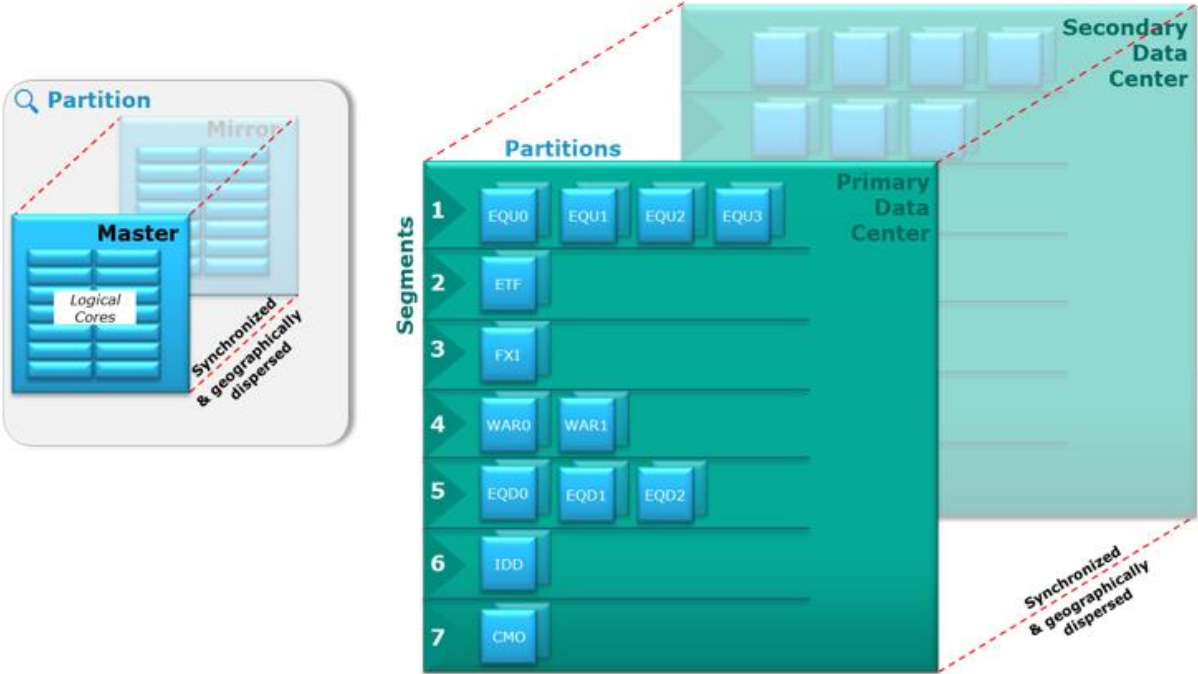

Redundancy

All data regarding the trading platform (order entry, matching engine and market data) is stored twice: on a master node and on its mirror, synchronised in real time and dispersed geographically.

This redundancy constitutes an additional layer of security in case of an incident: any event occurring on a given logical core (node A) is immediately mirrored in real-time on its secondary counterpart (node B). In the event of an incident leading to the failure of a logical core, Optiq's trading chain will automatically initiate a failover, shifting client system processing from the primary logical core to its mirror instance within the same environment.

Optiq has been engineered to autonomously detect anomalies and trigger failovers as necessary, without requiring manual intervention.

Following a failover, reconciliation reports are automatically generated to assist operations teams in identifying any potential gaps. For more detailed information, please refer to the 'Optiq High Availability' documentation available on the Euronext Customer portal (IT Documentation).

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This mechanism is designed to respond rapidly to any substantial issues encountered by the primary Optiq machine, minimising trading disruptions and ensuring the real-time synchronisation of orders and trades throughout the trading day.

As part of the Euronext business continuity management, a separate physical data centre has been established. In case of a disaster occurring at the primary data centre (located in Bergamo, Italy), Euronext thus has a distinct and redundant secondary data centre from where trading activities can be resumed.

Its features are tested regularly internally in a production-like situation, and externally at least once a year during a Disaster Recovery Test on a dedicated Saturday, in line with Commission Delegated Regulation 2017/584 (RTS 7).

Euronext has designed its trading architecture in line with requirements set out in Article 48 of Directive 2014/65/EU (MiFID II). Its architecture ensures that the Optiq systems are resilient, have sufficient capacity to absorb market volume, and maintain fair and orderly trading under exceptional market conditions.

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2. Continuous monitoring of the trading chain

Euronext has implemented robust monitoring of the whole trading chain in real time, 24 hours per day, seven days per week, to ensure early detection of potential issues. This monitoring is based on indicators and alerts covering, for example, infrastructure and applications, member connectivity, latency and debit of messages flowing along the whole of the chain, and synchronisation times.

Technical and operational teams are dedicated to the monitoring of the trading platform and are available 24 hours a day to resolve issues.

In the case of a serious issue impacting the market, Euronext may take unusual measures as part of its incident management process, to protect market participants.

3. Euronext Market Outage Plan

As outlined in the previous sections of this document, Euronext has implemented comprehensive safety measures to proactively mitigate any potential disruptions to its trading services. While the occurrence of an outage incident is improbable, it remains a possibility that necessitates a well-prepared response.

An incident is characterised as any deterioration of service or deviation from established service standards. The classification of an incident as 'Serious' is determined by its potential business impact. Here, we provide the definition of a 'Serious Incident':

"*A Serious Incident is defined as an event that has either halted the market entirely or, even if the market is still operational, significantly impeded a substantial number of members from trading due to technical reasons. Such events may encompass trading engine failures, issues with market data dissemination, challenges in the calculation and/or publication of Official Index Values, or problems with tools utilised for market management and operation.*"

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3.1. Serious incident management procedure

When a Serious Incident Process (SIP) is triggered, a dedicated organisation is in put place with the constant involvement of experts and management, and a shortened decision-making process is followed.

The priorities during a SIP are the following:

1. Keep markets open as long as they are operating in a fair and orderly manner;
2. Restore the service as quickly and safely as possible, whilst fulfilling our regulatory responsibilities. This includes always securing consistency between order and trade records;
3. Communicate appropriately and in a timely manner to internal and external stakeholders;
4. Prepare a secured end-of-day closing on the day of an incident;
5. Ensure normal trading hours on the day after an incident;
6. Carry out a post-event review and take actions to avoid the recurrence of an outage.

Remediation actions can vary depending on the timing as well as the trading phase during which the incident takes place.

3.2. Decisions which may be made during an outage

Euronext may take exceptional and punctual measures to protect market participants and ensure fair and orderly markets during an outage, including the following:

- **Manually halt the market** at instrument, logical core, partition, or segment level;
- **Deactivate a misfunctioning feature** to keep the market open;
- **Adjust usual timetables**, including changing market opening and closing auction times, or cancelling usual trading phases (call or continuous trading phases);
- **Cancel transactions** which occurred in improper market conditions;
- **Perform a global order book purge** at instrument, logical core, partition, or segment level;
- **Suspend one or several member(s)**;
- **Delay closing auction until 18:00 CET maximum for cash instruments**;
- **Use alternative methodology to calculate closing prices**;
- In extreme cases, **migrate to the disaster recovery site** to ensure business continuity.

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3.3.   Strategy to resume trading

A market halt may be caused by an automatic failover in the trading chain (protective measure for self-detected issues) or may be triggered by market operations teams if the market is no longer fair and orderly.

Conditions for reopening:

The operational team in charge of managing the SIP will decide when trading can safely be resumed. The market must be fair and orderly; consistency between orders and trades must be ensured, members of the exchange must be in position to resynchronise their systems with Euronext central order book and must be informed of the reopening in advance.

The following rules will be followed:

1. Euronext will always inform market participants before reopening and share the timeline via a **market status message** on the Euronext website.
2. A unique **time stamp**, corresponding to the time when the latest item persisted, will be provided to all members, to allow synchronisation between their trading systems and Euronext.
3. A **pre-opening/call phase** will be scheduled to allow all members to update their orders.
4. The pre-opening phase will last **15 minutes**. This phase may, however, be reduced to meet key cut-off times such as the closing auction for example.
5. In the case of a **continuous failover**, i.e. a switch to the back-up system in continuous mode (with no market halt), a specific informational market status message will be published. The continuous failover mechanism is available on equity segments.
6. In the event that the **integrity of orders** being stored on Euronext systems is compromised, Euronext will perform a global order book purge (regardless of order type and maturity). When performing such action, Euronext will issue a global communication and may not be in a position to send individual order cancellation acknowledgments.
7. Trades for which an **acknowledgement** has been sent by the Euronext trading system before the time stamp and received by a member will be considered as valid (with the exception of trades that are considered to have been conducted under improper conditions or have been individually cancelled by the market operator).

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3.4.   Outage impacting the closing auction

In standard conditions the closing auction occurs for Euronext equities at 17:35 CET (5 minutes before market close), and closing prices are then disseminated subsequently (20 minutes at the latest).

In the case of an outage, the closing auction may be postponed or cancelled, depending on the time at which the service is restored.

- **The closing auction can be postponed until 18:00 CET maximum**. No closing auction will take place after 18:00 CET. Euronext will communicate its intention whether or not to maintain the closing auction with prior notice by 17:30 CET.

- **If the 18:00 CET cut-off time cannot be met, an alternative methodology will be used to provide closing prices**. Euronext will use the last traded price to determine closing prices.

The communication prior to re–opening will always provide clear next steps including the time of the closing auction, or its cancellation and the use of the alternative methodology for closing prices.

3.5.   Communication during an outage

During an outage, Euronext remains fully available to answer market participants' and partners' questions or concerns via the usual communication channels.

Operational Client Services Desk for all operational queries:

clientsupport@euronext.com, +33 1 8514 8585.

Euronext will proactively provide accurate, clear and prompt information via three main channels: the Euronext market status webpage, technical private messages (Order Entry Gateway) and public messages (Market Data Gateway).

The main principles for communicating with members are the following:

1. After the discovery of a wide-ranging service degradation, it will be promptly reported via the **market status webpage** (even if the cause of the issue is not yet ascertained). The market status webpage is available to customers (members, ISVs, ASPs, data vendors), partners (clearing houses, Bourse du Luxembourg), internal departments and regulators: live.euronext.com/market-status

2. Euronext aims to report such issues within **30 minutes** after detection.

3. The market status webpage will be updated **every 30 minutes** thereafter (even if the situation remains unchanged), together with next steps for incident resolution and/or any other additional information or instructions, until the end of the outage.

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4. Euronext will communicate at least **15 minutes in advance prior to the pre-opening** of the market and will announce any **potential deviation from the standard timeline** (late closing auction for example) and any potential **purge of order books**.

5. Customers that have subscribed to the Market Status Alert email notification service will receive System Status alerts by email with details of the alerts posted on the market status webpage: *Connect | My subscriptions*. Market data vendors may relay these messages as well on their side.

6. For high-severity incidents, an **Info-Flash** is sent overnight by email to provide more information and confirm arrangements for the following morning.

Note: In the case of a failover, two technical messages are automatically sent to members, one via private channels (Order Entry Gateway "OEG" and drop copy) and one via by public channel (market data gateway).

▪ The Market Data message "Market Status Change (1005)" is sent to indicate the immediate change of the market state which blocks any new order, modification, or cancellation. This message is sent again when the pre-opening phase starts indicating that members order entry is allowed again.

▪ The Order entry message "SynchronizationTime (51)" will provide to members the timestamp of the latest message which has been registered in Optiq's systems. This means that all messages received before this timestamp are considered as valid, while messages received after this timestamp will not persist and need to be sent again.

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## 3.6.   Example of typical response to an outage

The complexity of flows and interactions between components of hardware, software and processes means that it is not feasible to set out every permutation of outage causes. However, sharing our priorities during an outage and providing examples may improve the ability of the market to predict Euronext's response.

Priority will be given to ensuring a fair and orderly market and integrity of orders and trades before reopening the market, protecting main trading phases and key cut-off times as much as possible.

Example 1 - Market outage during continuous trading on equities, standard closing auction maintained.

In the case of an outage occuring during continuous trading, Euronext will typically resume trading after service is restored.

A market status message informing partners about the reopening will be shared at least 15 minutes before pre-opening. The market status message will include the time schedule for the reopening (time of pre-opening and time to resume trading).
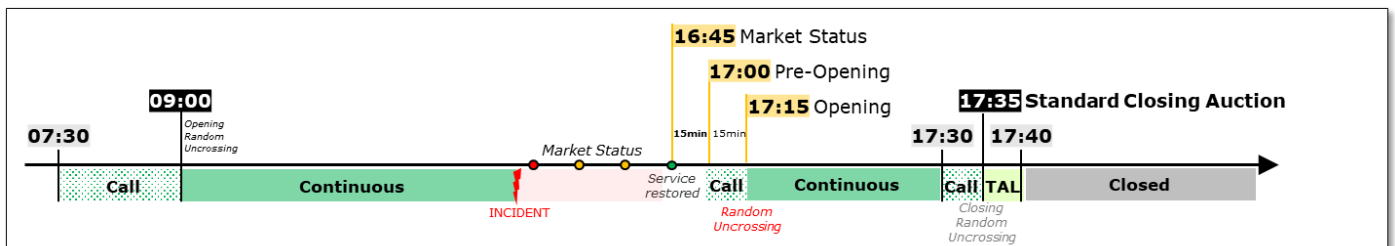
Example 2 - Market outage during continuous trading on equities, late closing auction.

Depending on the time at which the service is restored, Euronext may resume trading and amend the closing schedule and delay the closing auction.

A market status message informing partners of the reopening will be shared at least 15 minutes before pre-opening. The market status message will include the time schedule for the reopening (time of pre-opening and time to resume trading) and, when it is the case, the delayed time for the closing auction.
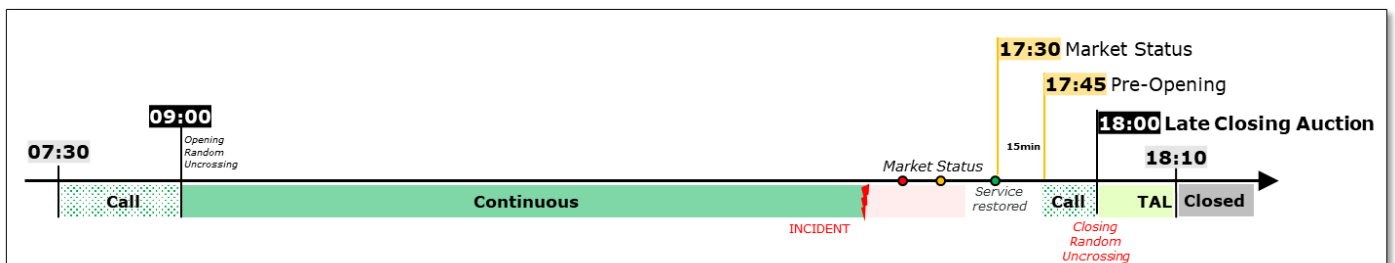
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Example 3 - Market Outage during continuous trading on equities, no closing auction.

In the case that service cannot be restored in time (17:30 CET by latest), Euronext will typically not resume trading, will cancel the closing auction and will use an alternative methodology to broadcast and disseminate closing prices.

A market status message informing partners of the decision not to reopen will be shared. The market status message will indicate the cancellation of the closing auction and the alternative methodology for closing prices.
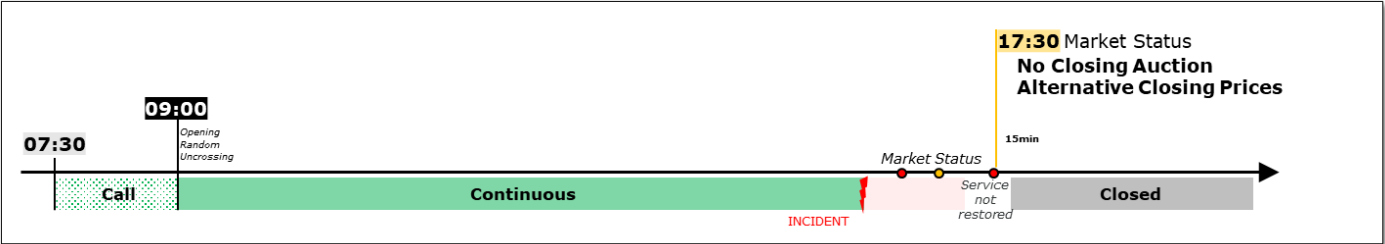
4. Post-mortem

In the event of a severe incident, Euronext will complete the market status communication with the issuance of an Info-Flash after market hours, to provide more details about the root cause (if available) and potential corrective actions required to avoid recurrence of similar issues. In this case, Euronext will also provide a detailed report to the Euronext regulators to provide more details on the outage and the mitigating measures that have been undertaken.

Any change impacting the trading chain will then be communicated to members using the usual channels.

Euronext may also provide full transparency to the regulators in case of a breach of regulation caused by an outage. The communication with regulators is managed bilaterally and includes a description of the issue with the timeline, a summary of measures taken during the outage, and corrective actions to avoid re-occurrence.

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Appendix - External references

This document refers to the following external documentation:

- **"Optiq High Availability"** documentation can be found on the Euronext Connect customer portal (IT Documentation)
- **"Euronext Data Centre"** set-up and connectivity documentation available on the Euronext Connect customer portal (IT Documentation)
- "**Order withdrawal and trade cancellation"** documentation can be found in the Regulation/Euronext Regulated Markets section of the Euronext website
- **Euronext "Trading manual"** documentation can be found in the Regulation/Euronext Regulated Markets section of the Euronext website.
- **"Appendix to Euronext Instructions 4-01 4-03 Trading Manuals"** sheet that details all the trading timetables in place, can be found in the Regulation/Euronext Regulated Markets section of the Euronext website.

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Support and Information

To guarantee member firms a fair, secure and reliable trading environment, dedicated Euronext market professionals are always on hand to provide advice and ongoing support.

Operational Client Services Desk

Contact the Operational Client Services Desk for all operational queries and support requests:

- across the Euronext Cash Markets, Derivatives Markets and MTFs.
- in both Test (EUA) and Production environments.

Telephone:

Belgium	+32 2620 0585	Norway	+31 20 721 9585
France	+33 1 8514 8585	Portugal	+351 2 1060 8585
Ireland	+353 1 6174 289	UK	+44 207 660 8585
Italy	+39 02 4541 1399		
Netherlands	+31 20 721 9585		

Email: clientsupport@euronext.com

Service hours: 08:00 – 19:00 CET.
Outside of these hours, calls will be transferred automatically to an available Markets Representative (06:30 – 22:30 CET).

Webpage:connect2.euronext.com/operational-client-services

Euronext Market status

live.euronext.com/market-status

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