

Document title

# **OPTIQ MARKET DATA GATEWAY (MDG): PHASE 1 - MIGRATION GUIDELINES**

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## PREFACE

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### PURPOSE

This document outlines important details regarding Phase 1 of the Euronext Optiq migration: Market Data Gateway for Cash and Derivatives markets.

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### TARGET AUDIENCE

The intended audience of this document is any client consuming Euronext Cash and Derivative market data. This document is for informational purposes only, and should be consulted alongside its associated documents, as outlined below.

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### 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
1.0	3 Nov 2016	Euronext	First release
1.1	18 April 2017	Euronext	Second release: updated version

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### ASSOCIATED DOCUMENTS

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

- [Technical specifications \(Phase 1\)](#)
  - Euronext Cash and Derivatives Markets - Change Highlights - XDP To Optiq MDG Migration
  - Euronext Cash and Derivatives Markets – Optiq MDG Client Specifications
  - Euronext Cash Market - UTP to Optiq MDG Transition Kinematics Specifications
  - Euronext Derivatives - UTP to Optiq MDG Transition Kinematics Specifications
  - Euronext Cash and Derivatives Markets - MDG File Specifications
  - Euronext Cash and Derivatives Markets – Optiq MDG Client Specifications – Discrepancies V-EUA
  - Configuration details (PDF format):
    - ◆ Euronext Optiq™ Market Data Gateway External User acceptance Environment
    - ◆ Euronext Optiq™ Market Data Gateway Production Environment
- [MDG templates and sample files](#)

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## CONTACT

Please find below the Optiq Support Desk contact details, which has been established to ensure customer readiness by:

- sending information to customers related to Optiq
  - answering customers' questions related to Optiq
  - assisting customers in their testing and validation on the EUA environment
  - providing follow-up on customer conformance testing
  - assessing customers' state of readiness with regards to technical changes
- 
- Optiq Support Desk
  - Tel: +33 1 70 48 25 55
  - Email: [optiq@euronext.com](mailto:optiq@euronext.com)

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## 1. INTRODUCTION

Euronext announced the launch of its new generation technology programme in May 2016, which will deliver improved customer experience through the migration from its current technology platform Euronext UTP to its new leading edge platform: Optiq®.

Optiq will deliver a simplified harmonized messaging model with maximum flexibility, within a single trading platform for cash and derivatives, providing clients with high performance and stability. The migration will be managed in phases, beginning in 2017 with the migration of our market data infrastructure. This will be followed by the migration of the Cash Markets to the new order entry and matching engine modules, and finally the migration of the Derivatives Markets order entry and Matching Engine in 2018.

The move to Optiq will allow Euronext to deliver an enhanced multi-market trading platform, leveraging the latest technology to ensure high reliability and to significantly enhance throughput and predictable latency. The simplified and flexible system will allow shorter time-to-market to deliver new products and implement customers' requests, while creating an opportunity for customers to reduce their administrative costs. The new platform will be compliant with MiFID II regulation.

This document will outline the changes and improvements between the current Euronext Market Data Exchange Data Publisher (XDP) and the Optiq Market Data Gateway (MDG) messages and processes, for the first phase of the migration. During this first phase, the Euronext UTP trading engines and Order Entry Gateways (CCG's) remain unchanged and only XDP will be replaced by Optiq MDG. During the transition phases, while Optiq MDG is still connected to the Cash and Derivatives Euronext UTP matching engines, all trading functionalities remain the same and behaviors are not modified.

This document relates to the specifications of the new Optiq MDG linked to UTP-Cash and UTP-Derivatives matching engines (Phase 1).

This document will describe:

1. Detailed Migration approach
2. Functional changes explained
3. Market Data Gateway testing and validation requirements
4. Important timeline details, deadlines, and required weekend testing dates

Note: Hosted commercial markets, SmartPool and BondMatch are out of scope for the migration from XDP to Optiq MDG.

## 2. MARKET DATA GATEWAY OVERVIEW

The Euronext Optiq Market Data Gateway (MDG) will deliver several important benefits of the Optiq programme. It will provide high-speed, real-time market data for Euronext markets with increased capacity and scalability. Delivering a highly flexible solution was also a key objective of the design, and with the introduction of a brand-new technical infrastructure, a new protocol, and innovative methods of processing market data, Optiq aims to be a leading edge trading platform. Optiq will be fully flexible and will take advantage of an entirely multicast implementation for a faster, more predictable, and significantly more stable market data feed.

The data feed has the following high-level features:

- Multicast technology
- MiFID II compliance
- Ultra-low latency
- Cash & Derivatives message harmonization
- Optimized feed for each type of connectivity
- Simplified data recovery thanks to the new snapshot functionality
- High availability
- Reliable network solution
- High level of scalability
- Access to a wide range of European market data sets

The Optiq Market Data Gateway is also designed to be fully MIFID II compliant by offering:

- Market Data channel disaggregation: Each multicast channel published by MDG can be disaggregated as follows: asset class, currency and country as per the MiFID II requirements. Additionally, there are dedicated channels for pre-trade and post-trade.
- Higher Transparency: The Full Trade Information message (1004) delivered by Optiq MDG will carry MMT Trade flags and other fields as required by MiFID II.
- Improvements in terms of non-functional monitoring, business continuity and time stamping.

In order to deliver the aforementioned features of the Optiq MDG feed, clients will have access to the following services:

- Real-Time feed: Clients will be able to connect to multicast channels to receive Market Data messages in real-time.
- Snapshot service: The request-based retransmission and refresh recovery mechanisms will be replaced by unsolicited snapshots in the Optiq Market Data Gateway, and will allow clients to manage packet loss more efficiently. Following a lost connection to the market, clients will be able to leverage multicast snapshots to quickly and easily reconcile their order books. The recovery mechanisms currently in place are significantly improved with the Snapshot messages, dedicated login credentials are no longer required, and full book depth and price updates are easily available. Using brand-new sequence number methodology, the new Snapshot will be designed such that clients will be able to efficiently process and queue real-time updates and accurately integrate the snapshot messages seamlessly. Some of the advantages of the Snapshot functionality are:
  - 1. Real-time message recovery mechanism
  - 2. Full multicast implementation
  - 3. New sequence number methodology for faster recovery
  - 4. Administrative efficiencies, as login credentials are no longer needed
- File services: Clients will be able to connect to an HTTPS file server each day to download key information, such as standing data and feed configurations, instrument timetables, tick tables, XML SBE templates and trading pattern IDs. During the trading day, it will be possible to download the Full Trade Information files containing all the trades of the day. More details are available in the [March 2017 technical note](#), as well as in the [associated technical specifications](#).

In order to create a market data feed adapted to a wide range of client connectivity profiles, market data is available compressed, shaped and unshaped. With this fit to purpose approach with Optiq, customers are able to choose on a much more granular level the exact market data package and channels required.

- Unshaped channels publish messages generated by the matching engine immediately, without packetization and bandwidth constraints. These channels require 10Gb connectivity and will allow clients to take full advantage of higher bandwidth capacities. The fully unthrottled nature of the unshaped feeds, however, might require some initial bandwidth capping to secure the transition onto Optiq, to fully evaluate the actual data usage and bandwidth requirements, and to fine-tune if necessary. Further information on bandwidth usage and performance will be provided throughout the course of the programme and especially once production-like conditions allow for it.
- Shaped channels provide clients with an optimized low-latency market data feed, also taking advantage of higher bandwidth capacities of clients with 1Gb network connectivity. These channels will be configured with bandwidth caps to prevent micro bursting and data loss, and will utilize more efficient packet sizing.
- Compressed channels and data conflation will be available for 100Mbps clients, in order to more efficiently diffuse data to clients with low bandwidth connections. These channels are designed specifically with 100Mbps clients in mind, and will allow these clients to consume market data available in shaped and unshaped channels, but compressed to fit a smaller connection.

## 2.1 BENEFITS

The Optiq Market Data Gateway has been developed specifically for Euronext's markets, and customers will benefit from a simplified and flexible system allowing shorter time-to-market to deliver new initiatives and implement customers' requests while creating an opportunity to reduce administrative costs. Some of these benefits include:

1. New protocol: Simple Binary Encoding (SBE)
2. New lost packet recovery mechanism: Snapshot
3. Improved BBO management

### 1. NEW PROTOCOL: SBE

One of the major improvements that will be delivered by Optiq is the use of the Simple Binary Encoding (SBE) protocol. Leveraging the benefits of SBE, Optiq will provide maximum flexibility and harmonization to both market data and order entry across all Euronext Cash and Derivatives. This will replace the current Euronext UTP Binary protocol on Euronext Cash and Derivatives markets, and will offer the possibility of backward and forward compatibility after the migration. Thanks to this significant message protocol change, clients will no longer be required to implement the latest message structure version, thereby providing clients with a more flexible implementation approach for new releases and functionalities.

### 2. NEW LOST PACKET RECOVERY MECHANISM: SNAPSHOT

One of the many benefits that Optiq will deliver to clients is the new Snapshot functionality. The request-based retransmission and refresh recovery mechanisms will be replaced by unsolicited snapshots in Optiq Market Data Gateway, and will allow clients to manage packet loss more efficiently. Following a lost connection to the market, clients will be able to leverage multicast snapshots to quickly and easily reconcile their order books. The recovery mechanisms currently in place are significantly improved with the Snapshot messages, dedicated login credentials are no longer required, and full book depth and price updates are easily available.

### 3. IMPROVED BBO METHODOLOGY

Optiq MDG will introduce the **Market Update** message on the Cash market, as well as on the Derivatives market, and it brings a totally new way of delivering BBO information. This message provides the market with valuable data needed to build the best bid and offer limits, and is sent after each impact on a limit following an order entry is disseminated to the market through a Market Update message (quote driven markets), as well as for best limits (all markets). Each Trade is notified to the market with a short summary based on this message. On Cash Markets, each change of dynamic collars is notified through a Market Update. The 'market by limits' message was extended to Equities, Funds (Including ETFs) and Fixed Income instruments. This information will be made available by amending the existing Best Bid and Offer (BBO) channels. The Equities, Funds, & Fixed Income Best Bid and Offer (BBO) channels have been changed in the MDG message specifications to become Full Order Book – Market Update Channels (including BBO). This target solution was made available in V-EUA in February, and is also reflected in the Market Data SFTI order forms

## 2.2 NEW MULTICAST CHANNELS

The Optiq Market Data Gateway will provide all of the same information currently available in the UTP Market Data Feed (XDP), but will be split across multicast channels on a more granular level. Significant attention was given to rationalize the number of messages while continuing to provide the required information. As a result, some market data messages have been consolidated into a single message, and some messages are grouped into channels differently than is the case with XDP. New multicast channels have been created for MDG, notably to comply with the new MiFID II requirements, and customers will have to select the appropriate packages for their connectivity profile as well as their business needs. The table below provides an overview of the different data packages that will be available in Optiq MDG:

	10 Gbps Unshaped	1 Gbps Shaped			100 Mbps Shaped, Compressed and Conflated	
	Only available for Equity and Index Futures and index Options for France and Netherlands					
	Pre-Trade					Post-Trade
	Full Order Book Market Update	Full Order Book Market Update	Best Bid and Offer	Full Order Book Market Update	Best Bid and Offer	Reference Data <sup>1</sup> and Full Trade Information
Start Of Day (1101)	X	X	X	X	X	X
End Of Day (1102)	X	X	X	X	X	X
Health Status (1103)	X	X	X	X	X	X
Trade Retransmission Start (1104)						X
Trade Retransmission End (1105)						X
Timetable (1006)						X (only for Warrants)
Market Status Change (1005)	X	X	X	X	X	
Standing Data (1007)						
Contract Standing Data (1013)						X
Outright Standing Data (1014)						X
Strategy Standing Data (1012)						X
Exchange Announcement (1010)						X
Market Update (1001)	X	X	X <sup>2</sup>	X	X <sup>2</sup>	
Order Update (1002)						
Price Update (1003)						X
Full Trade Information (1004)						X
Real Time Index (1008)						
Statistics (1009)						X
Index Summary (1011)						

<sup>1</sup> Reference Data represents: all instruments characteristics, scheduled phases and market administration messages.

<sup>2</sup> This message will not provide: New Bid (3)/New Offer (4), Updated Bid (5) /Updated Offer (6), New Bid With Liquidity Provider (58)/New Offer With Liquidity Provider (59), Updated Bid With Liquidity Provider(60)/ Updated Offer With Liquidity Provider (61), New Bid RLP (Retail Liquidity Provider) (16)/ New Offer RLP (Retail Liquidity Provider) (17), Updated Bid RLP Retail Liquidity Provider) (18)/ Updated Offer RLP (Retail Liquidity Provider) (19), New Bid SI (20)/ New Offer SI (21) and Updated Bid SI (22)/ Updated Offer SI (23).

Some of the key aspects to note with regards to MDG channel design:

- Full market depth is available across all Euronext markets: an order-driven model for Cash Equities, ETF's and Fixed Income, and a level-based depth for Warrants & Certificates, RMF, SI, Equity and Index/Currency and Commodity Derivatives.
- Each real-time multicast channel has a Snapshot channel available in parallel, which allows customers to fully recover from an outage or from packet loss.
- A dedicated Post-Trade channel will be available in MDG.

More details on selecting the appropriate data package can be found in the sections below.

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## 2.3 NEW FILE METHODOLOGY

With Optiq MDG will come a new way of processing certain information, such as Standing Data and feed configurations, Timetables, Tick Tables, XML SBE template and Pattern IDs. Clients will also have the possibility to download intraday trade files, providing the full trade details during the current trading day.

Standing data will now be available for both Cash and Derivatives markets, and the files will also include the dedicated feed configuration information – all in a single file. All files will be in machine-readable XML format, and will be available at all times via SFTI. Users of the Euronext market data feed should use the HTTPS Server to:

- Configure feed connections every day
- Support the referential data that is disseminated on the feed
- Complete their list of trades

The Euronext File Services (EFS) is an exciting innovation to be implemented during the first phase of the Optiq migration, which will allow for a single access point for clients to retrieve critical daily files. The new service will be on a fully resilient and secured infrastructure, and will be accessible via the SFTI network as well as over the internet.

During the first phase of the roll-out of the EFS, Cash and Derivatives Market Data files will be available, and the order entry and matching engine files for both Cash and Derivatives markets will be deployed during Phases 2 and 3, respectively.

Some examples of files that clients will access via the new EFS are:

- Optiq Market Data Gateway XML files, including standing data
- Full Trade Information files, which are updated daily and include all trade data
- Tick size information
- Simple Binary Encoding (SBE) templates

The current file transfer solution uses the FTP protocol, with generic login credentials, and without access via the Internet for Production. The new EFS solution will utilize the **HTTPS protocol**, and individual user accounts will be used instead of a single generic account. Offering both SFTI and Internet access, the EFS will bring a secure, stable and harmonized approach to both Cash and Derivatives markets for file transfer going forward.

Clients can test the new EFS solution in the Optiq EUA environment. More details are available in the [March 2017 technical note](#), as well as in the [associated technical specifications](#).

### 3. MIGRATION STRATEGY

The decision to begin the Optiq migration with Cash and Derivatives Market Data first, followed by the Cash and then the Derivatives Matching Engines and Order Entry Gateways was driven by strong customer demand for a phased approach, as well as the desire to deliver a significantly improved market data feed and to quickly implement a significantly improved and MiFID II compliant feed.

For the first phase of the programme, the chosen migration strategy is designed to ensure a smooth transition onto the Optiq Market Data Gateway, while allowing customers sufficient time to perform all necessary testing prior to their migration to the MDG feeds. The following sections will outline how a secure move onto the new Optiq MDG will be guaranteed, as well as key details on the timeline and the migration onto the EUA and production environments.

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#### 3.1 OVERVIEW

The migration from the XDP market data feed to the Optiq MDG feed is designed with customers in mind, to secure a stable transition onto the new Optiq platform. The V-EUA (virtual) platform opened for technical connectivity testing in November 2016, followed by the opening of the P-EUA (physical) platform mid-March 2017 for connectivity testing. The Production implementation of Optiq MDG for both Cash and Derivatives will conclude in June 2017 (on Cash) and July 2017 (on Derivatives).

The test environments allow clients to fully validate their systems against MDG, from basic connectivity to full functional and failover testing.

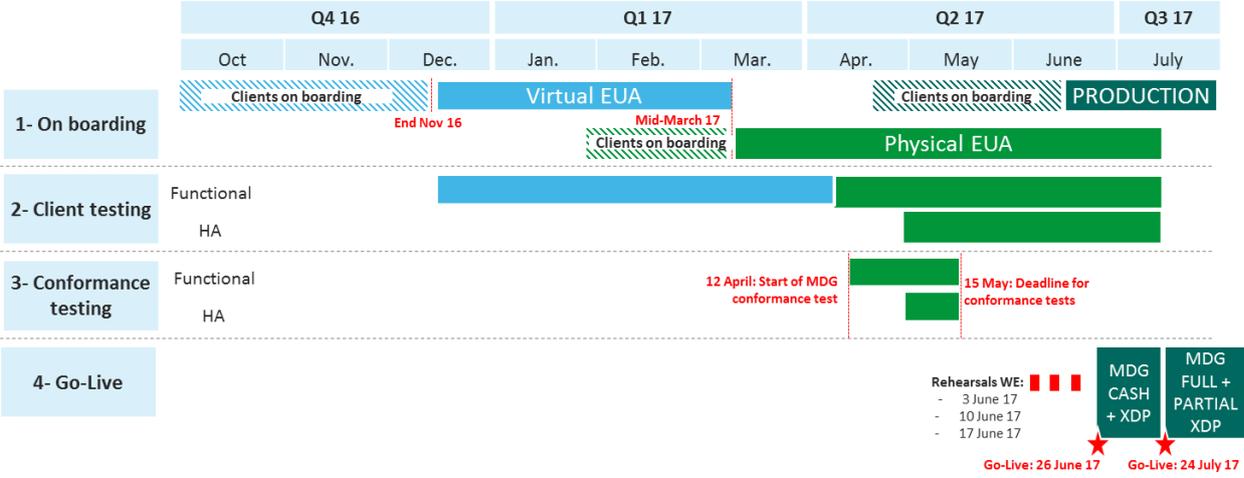
The migration onto Optiq MDG Production will entail EUA connectivity testing, a fully functional test environment, three dress rehearsal weekends test dates for both Cash and Derivatives, a week of external pre-production before each go-live, and will conclude with a Saturday go-live of MDG for Cash and a second Saturday go-live for MDG Derivatives. Each phase of the migration will include customer participation and testing.

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#### 3.2 TIMELINE

Following customer requests, the production implementation of Optiq MDG will be phased, beginning first with the Euronext Cash markets, followed by the Euronext Derivatives market. In order to ensure a smooth migration onto Optiq MDG, XDP will be available for two weeks post migration for the Cash market and one week for the Derivatives market. Since each market will migrate over a single weekend, all customers can benefit from the improvements brought by Optiq MDG at the same time.

The following graphic provides a detailed overview of the major milestones of Phase 1 of the Optiq programme, and outlines the on-boarding, testing and production implementation timeline.



EUA Platform openings:

- V-EUA opened on 29 November 2016 for connectivity testing and end December 2016 for functional testing
- P-EUA opened on 14 March 2017 for connectivity testing and will open on 12 April 2017 for conformance testing

Clients will be expected to participate in mandatory weekend testing on the production environment, which will take place on the following dates:

- Dress Rehearsal #1 on Saturday 3 June 2017 (Cash and Derivatives):
- Dress Rehearsal #2 on Saturday 10 June 2017 (Cash and Derivatives)
- Dress Rehearsal #3 on Saturday 17 June 2017 (Cash and Derivatives)
- Saturday go-live: (Cash) on Saturday 24 June 2017
- Saturday go-live: (Derivatives) on Saturday 22 July 2017

Production Platform openings:

- Optiq MDG Cash channels will be available in Production on 26 June 2017 (XDP-C will no longer be broadcasted after 7 July 2017)
  - ◆ Optiq MDG Cash channels will be available in pre-Production on 19 June 2017 but will not be the primary flow
- Optiq MDG Derivatives channels will be available in Production on 24 July 2017 (XDP-D will no longer be broadcasted after 28 July 2017).
  - ◆ Optiq MDG Derivatives channels will be available in pre-Production on 10 July 2017 but will not be the primary flow

Note: all official and confirmed dates will always be communicated via Info Flash.

The XDP infrastructure will be decommissioned at a later stage, and will be communicated in due course.

### 3.3 TEST ENVIRONMENT

In order to maintain a stable test environment for the existing Euronext UTP platform, customers will be able to access EUA for both UTP and Optiq. The migration strategy chosen means that there will be different EUA environments running in parallel: MDG testing started on the new virtual EUA (V-EUA) in **November 2016**, then connectivity to the existing physical EUA (P-EUA) environment became available in **March 2017**, and further testing such as failover and mandatory conformance testing in April 2017

Customers need to implement the appropriate connectivity details for P-EUA as of 12 April 2017. All connectivity details for P-EUA are available in PDF format and XML machine-readable format, in both the Optiq documentation section of the Euronext website and the file server

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### 3.4 PRODUCTION ENVIRONMENT

As requested by customers, there will be a phased approach for the implementation of Optiq MDG in the production environment, with a full deployment completed in July 2017: the Euronext Cash market will migrate first onto MDG, followed by the Euronext Derivatives market. This phased approach means that all Cash products will migrate in June over one weekend, followed by all Derivatives products a few weekends later in July. That is, the full Cash product universe will migrate at the same time, followed by the full Derivatives market.

Customers have expressed their wish to benefit from a dual run period (i.e. a period during which both XDP and MDG feeds will be available) to be able to test their feed handlers. Euronext will offer both an external pre-production period and a dual run period for each migration:

The cash pre-production period will begin on 19 June 2017:

- During the week of pre-production, the MDG cash feed will be broadcasted but XDP will still be considered the primary Euronext market data feed. MDG Cash will then go live on 26 June 2017 at which point MDG Cash will become the primary feed for our cash markets. This will be followed by a two week dual run period. XDP Cash will no longer be broadcasted after market close on 7 July 2017.

The derivatives pre-production period will begin on 10 July 2017:

- The pre-production phase for derivatives markets will last two weeks, during which the MDG derivatives feed will be broadcasted but XDP will still be considered the primary Euronext market data feed for derivatives. MDG Derivatives will then go live on 24 July 2017 at which point MDG will become the primary feed for our derivatives markets. This will be followed by a week-long dual run period and XDP Derivatives will no longer be broadcasted after market close on 28 July 2017.

All Production connectivity details are available in PDF format, and will also be available XML machine-readable format, in the Optiq documentation section of the Euronext website.

## 4. TEST ENVIRONMENT: DETAILS AND REQUIREMENTS

In order to secure the migration onto the Optiq MDG production platform, clients will be required to validate full conformance testing by **15 May 2017**. This will include both functional and high-availability testing, which will represent a change in that only technical conformance has been required in the past. The addition of functional conformance testing provides an opportunity to test that client applications are able to receive the new MDG messages, but also that they are properly interpreted and correctly integrated into the trading system.

We will facilitate the conformance testing by assisting clients with test scenarios and injecting data, and will be available by 12 April 2017:

- Fully detailed conformance test scripts
- Conformance test guidelines, outlining all required conformance steps, the organization of tests, the testing timelines. Clients are strongly encouraged to perform testing in V-EUA, in order to be fully prepared to validate conformance testing which will begin on 12 April 2017 on P-EUA.
- EFS credentials

Optiq MDG conformance testing will be mandatory for all member developers and technology providers (ISV's, ASP's and Market Data Vendors). Clients using technology providers will **not** be required to pass conformance testing as this will be managed by their providers. Clients using a mixed in-house and provider solution for market data will, however, need to validate conformance testing on their in-house developed solution.

### Optiq MDG customer readiness checklist:

- ✓ Dedicated Optiq [Contact Registration](#)
- ✓ Customer testing on V-EUA (29 November – 12 April 2017)
- ✓ Confirmation of [connectivity to P-EUA](#) (by 12 April 2017)
- ✓ Conformance test validation on P-EUA (12 April – 15 May)
- ✓ Confirmation of connectivity to MDG Production (will be provided in April 2017)
- ✓ Mandatory participation in at least one Saturday dress rehearsal in June
- ✓ Mandatory participation in the Saturday Go live for MDG Cash (24 June 2017) and Derivatives (22 July 2017).

### 4.1 RELEASE SCHEDULE

<p><b>BUNDLE 1</b></p> <ul style="list-style-type: none"> <li>▪ Start of Day, Health Status, End of Day</li> <li>▪ Order Update</li> <li>▪ Market Update</li> <li>▪ Market Status Change</li> <li>▪ Price Update</li> <li>▪ Timetable</li> <li>▪ Standing Data files</li> <li>▪ Line A + Line B</li> <li>▪ Shaping</li> <li>▪ Routing/Filtering</li> <li>▪ Channel configuration</li> </ul> <p><b>Delivered</b></p>	<p><b>BUNDLE 2.1</b></p> <ul style="list-style-type: none"> <li>▪ Messages:                             <ul style="list-style-type: none"> <li>▪ Exchange announcement</li> <li>▪ Statistics Deriv.</li> </ul> </li> <li>▪ Compression</li> <li>▪ Cash Tick size file</li> </ul> <p><b>BUNDLE 2.2</b></p> <ul style="list-style-type: none"> <li>▪ Messages:                             <ul style="list-style-type: none"> <li>▪ Standing Data</li> <li>▪ Full Trade Information</li> <li>▪ Statistics Cash</li> </ul> </li> <li>▪ Snapshot (start and end of snapshot messages)</li> </ul> <p><b>Delivered</b></p>	<p><b>BUNDLE 3</b></p> <ul style="list-style-type: none"> <li>▪ Messages:                             <ul style="list-style-type: none"> <li>▪ Snapshot Order Update</li> <li>▪ Snapshot Market Update</li> <li>▪ Snapshot Market Status Change</li> <li>▪ Snapshot Price Update</li> <li>▪ Snapshot Full Trade Information</li> <li>▪ Snapshot Standing Data</li> <li>▪ Snapshot Timetable</li> <li>▪ Snapshot Statistics</li> <li>▪ Statistics for Indices</li> <li>▪ Real time index</li> <li>▪ Index summary</li> <li>▪ Standing data Indices</li> </ul> </li> <li>▪ Indices Standing Data file</li> <li>▪ SRD and L&amp;B Settlement Prices file</li> <li>▪ Open Interest file</li> </ul> <p><b>Delivered</b></p>	<p><b>BUNDLE 4.1</b></p> <ul style="list-style-type: none"> <li>▪ Timetable file</li> <li>▪ PrevdayCapandVolfile</li> <li>▪ TCS (on-exchange)</li> </ul> <p><b>Delivered: 12 April</b></p> <p><b>BUNDLE 4.2</b></p> <ul style="list-style-type: none"> <li>▪ Messages:                             <ul style="list-style-type: none"> <li>▪ TCS (off-exchange)</li> <li>▪ Indices for BDL</li> </ul> </li> <li>▪ High Availability Functionalities</li> <li>▪ Full Trade Info file</li> </ul> <p><b>Scheduled: end April</b></p>
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## 4.2 CONFORMANCE

The conformance testing will consist of two distinct parts: technical and functional conformance.

For the technical portions of the testing, clients will be presented with several different types of failures, and will be expected to manage each failure appropriately. The test scenarios will be generated by Euronext and a test schedule will be communicated at a later date. Clients must be able to manage the following failure situations in order to successfully validate the Optiq MDG conformance testing:

- **Packet loss** recovery using **Line Arbitration** and **Snapshot** techniques to retrieve missed packets (conformance on snapshot will not be mandatory<sup>1</sup>)
- **Emergency commands** including **Market sheet** and **key market data broadcast** for order retransmission and resynchronization as well as Market Status & Price Updates
- **SBE protocol**
- **Client connectivity** to guarantee that clients are able to subscribe to the appropriate bandwidth channels.
- **System failures** including **High Availability**, **Disaster Recovery** and **Client system failure**
  - ✓ The high availability test is a list of checks to guarantee that the failover runs smoothly in case of an outage in the primary publisher
  - ✓ The disaster recovery test requires that clients ensure that all configurations surrounding the secondary data center are in place, as described in the **Feed Configuration Specification document**.
  - ✓ The Client system failure test will ensure that in the event of a client-side failure, the client's backup system can continue to process the real-time and snapshot data sent on the second multicast group.

The functional conformance testing will allow customers to validate the full scope of the Optiq MDG feed, taking into account all message types that will be offered. This testing will be made available across all markets, and across all product types.

During this test we will simulate a full trading day of market data, and clients will be expected to integrate data for a set of dedicated test instruments and then communicate the details of the data received (such as prices, quantities, market updates, instrument status changes).

We will facilitate conformance testing by assisting clients with test scenarios and injecting data, and will also provide by 12 April 2017:

- Fully detailed conformance test scripts
- Conformance test guidelines, outlining all required conformance steps, the organization of tests, the testing timelines. Clients are strongly encouraged to perform testing in V-EUA, in order to be fully prepared to validate conformance testing which will begin on 12 April 2017 on P-EUA.

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<sup>1</sup> With regard to the features [features: Snapshot, full trade information 1004, statistics 1009, exchange announcement 1010, disaster recovery site, derivatives standing data file 9013, full trade information file 9030, time table file 9001, cash standing data file 9007 ] Euronext recommends the Customer to submit the Features to conformance testing. However, as the Features are optional, testing the Features is not mandatory for the Customer. In the event the Customer does not test the Features, Euronext accepts no liability / responsibility for any and all claims, suits, proceedings, expenses, losses, liability and/ or damages arising from or related to the Features. The Customer ensures that it understood and accepts Euronext's explicit recommendation to submit the Features to conformity tests, as well as Euronext's disclaimer for the event the Customer chooses not to test the Features. Nothing in this paragraph limits Euronext's liability to the Client for (a) death or personal injury caused by the negligence of Euronext; (b) fraud; (c) willful misconduct or gross negligence;

### 4.3 CONNECTIVITY

Clients should refer to the Feed configuration file for full connectivity details onto both the V-EUA and P-EUA environments. As a reminder, clients implemented the appropriate connectivity details for V-EUA as of November 2016.

Clients should now implement the appropriate connectivity details for P-EUA. All connectivity details for P-EUA are available in PDF format and XML machine-readable format, in the Optiq documentation section of the Euronext website as well as the file server. Clients are asked to complete the P-EUA [connectivity form](#) on the Optiq webpage. They will also be asked in April 2017 to fill in the **Production** connectivity form.

*Important: This form can only be completed by the nominated MCA of each company. If you do not have an MCA account, please contact Customer Access Services ([cas@euronext.com](mailto:cas@euronext.com) or +33 1 85 148 589).*

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### 4.4 DRESS REHEARSALS

Three MDG dress rehearsals will take place in June 2017 allowing customers to test the target production implementation of both MDG Cash and Derivatives prior to the production go-live. The first dress rehearsal will take place on Saturday 3 June 2017, followed by the second rehearsal on Saturday 10 June 2017 and the third rehearsal on Saturday 17 June 2017. The three Saturday dress rehearsals will cover both Cash and Derivatives, disaster recovery connectivity as well as the roll-back to XDP.

The roll-back to XDP after each dress rehearsal should be managed by the participants of each test, to ensure a smooth start-up on the next trading day. All clients are required to participate in at least one Saturday dress rehearsal, as well as the go-live Saturday prior to the production implementation of MDG Cash (24 June 2017) and Derivatives (22 July 2017). Clients will be able to perform latency measurements during Saturday dress rehearsals.

During the go-live Saturday tests, clients will connect to the UTP Matching Engine and Order Entry Gateways (CCG's), as well as to the MDG multicast channels that will be implanted in Production on the next trading day. This represents the target implementation, and if the go-live is confirmed then clients will keep the configuration in place and **not** perform a roll-back in order to begin trading using Optiq MDG-Cash on Monday 26 June 2017 and Optiq MDG-Derivatives on 24 July 2017.

A detailed description of the dress rehearsals, go-live organization and test scenarios will be provided in due course.

## 5. MARKET DATA PACKAGES

Optiq MDG has been designed to allow customers to maximize their chosen market data packages with their network connectivity, whether using 100Mb, 1Gb or 10Gb lines. The Channel Types and Channel ID's that are available to each customer depend on the available bandwidth on customer connections to the SFTI Network, and this section aims to clarify how customers should select market data channels during the SFTI on-boarding and provisioning process. The MDG infrastructure will broadcast feeds which are optimized for different line capacities, and clients will have the opportunity to choose the combination of feeds and network connectivity that fit their needs.

Euronext offers real-time and snapshot Market Data through different channels that clients can subscribe to. Each channel is linked to a unique IP multicast group address and a unique port.

Channels are split according to the following criteria:

- Asset Class (MiFID II requirement)
- Country of issue (MiFID II requirement)
- Currency (MiFID II requirement)
- Real-time and Snapshot messages are sent through different channels

Asset Class	Currency	Country Split	Optiq Segment	Number of Partitions
Equities	All	Netherlands	Equities	4
		France		
		Belgium		
		Portugal		
		UK		
Euronext Retail Matching Facility (RMF)	All	All		
Euronext Equity Off-Exchange Trade Reports	All	All		
Société Générale Systematic Internaliser (SI)	All	All		
ETFs	All	All	ETFs	1
Fixed Income	All	All	Fixed Income	1
Warrants and Certificates	All	All	Warrants and Certificates	1
Bourse de Luxembourg	All	All	Bourse de Luxembourg	1
Equity Options	All	Netherlands	Derivatives - Options	2
		France		
		Other (Belgium and Portugal)		
Index Options	All	Netherlands	Derivatives - Options	2
		France		
		Other (Belgium and Portugal)		
Currency Options	All	All		
AtomX (for Flex Contracts)	All	All		
Equity and Index Futures	All	Netherlands	Derivatives - Futures	2
		France		
		Other (Belgium and Portugal)		
Currency Futures	All	All		
Commodity Derivatives	All	All	Commodity Derivatives	1
Indices	All	All	Indices	1

Types of data:

- Full Order Book (FOB including BBO) channel provides full order book depth.
- Best Bid and Offer (BBO) channel will only provide the best limits when they are updated.
- Reference Data and Full Trade Information channel all instrument characteristics, scheduled phases, market administration messages and MiFID II compliant trade messages. Index messages are included in this channel only for Bourse de Luxembourg (BdL).
- Reference Data and Index Package channel all instrument characteristics, and Index messages.

In the conception of MDG, specific focus was put on avoiding the duplication of data across different types of channels.

Channels are either totally unshaped, shaped to 1 Gbps, or compressed and conflated for 100 Mbps connections. Given the current liquidity profiles of traded instruments, the unshaped channels are only available for the Full Order Book channels and for the following Asset Classes:

- Equities France
- Equities Netherlands
- ETF's
- Equity and Index Futures France
- Equity and Index Futures Netherlands
- Index Options France
- Index Options Netherlands

The number of channels to which a client can subscribe depends on their type of client connectivity. For example, if a client has a 100 Mbps line, then he cannot subscribe to the unshaped channels which are only offered on 10 Gbps lines nor subscribe to the shaped BBO channels, which are only available on 1 Gbps lines. Similarly, 1 Gbps clients cannot subscribe to the unshaped data, which is only available on 10 Gbps lines. Conversely, a client with a 10 Gbps line can subscribe to all available channels like the Full Order Book channels (either unshaped (10 Gbps) or shaped (1 Gbps)) as well as to the compressed, conflated and shaped channels (100 Mbps).

The feeds were specifically created to cater to all clients, regardless of their type of connectivity: 100Mbps, 1Gbps and 10Gbps. The compressed and shaped data feeds have application-level throttles and these thresholds will be defined to fit onto 100Mbps and 1Gbps lines.

The bandwidth allocations have been designed to facilitate the channel ordering process and give an estimate of the required bandwidth. The Optiq MDG bandwidth usage estimations were made using current data volume metrics and expected Optiq MDG packet sizing and throughput, taking into account micro bursting. Further information on bandwidth usage and performance will be provided in the course of the programme and especially once production-like conditions allow for it.

This new methodology will give clients more control over their chosen market data packages, and creates the opportunity for clients to subscribe to data on a much more granular level. For clients particularly conscious of bandwidth requirements, this will potentially allow them to provision less data and therefore require less bandwidth. Clients should therefore review their current connectivity to ensure that existing bandwidth corresponds to the desired type of Optiq MDG feeds. Bilateral meetings are on-going with Euronext Client Readiness and SFTI Sales teams to work with clients to ensure the appropriate packages are chosen.

## 6. MDG: EUA AND PRODUCTION DATA PROVISIONING

The connectivity on-boarding process was designed to secure a smooth migration onto the EUA and Production environments for Optiq Market Data Gateway. Clients should have now submitted new SFTI order forms, working closely with the on-boarding team to ensure that all required data is chosen and provisioned.

The following sections outline the connectivity provisioning process for Optiq MDG, which began in October 2016 and will conclude in April 2017.

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### 6.1 EUA ACCESS

In order to facilitate easy access to the Market Data Gateway V-EUA environment, the Cash and Derivatives MDG EUA market data will be made available to **all customers already provisioned** for EUA XDP access. Customers will be able to use the recently communicated MDG connectivity details to access all MDG EUA multicast channels. Once configured, basic connectivity testing to the V-EUA multicast channels will be possible.

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### 6.2 PRODUCTION ACCESS

New market data packages will need to be chosen for MDG, and clients will work closely with representatives from the Optiq Client Readiness and the SFTI on-boarding teams to select the appropriate data packages. This will be done on a case by case basis, to ensure that all clients have access to all required data and that the order forms are in line with actual data needs. The new SFTI order forms should be completed and signed by mid-April 2017 to secure enough time to finalize the provisioning before the first dress rehearsal.

Clients will be invoiced by SFTI for MDG EUA and Production market data once XDP Cash and Derivatives are no longer used for production on our cash and derivatives markets, in June 2017.

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### 6.3 BANDWIDTH REQUIREMENTS

The Optiq MDG channels have been designed specifically to optimize market data bandwidth usage for each connectivity profile: 100Mb, 1Gbs and 10Gbps. As such, line capacity upgrades are not required in order to consume Optiq market data. Should clients choose to increase their line capacity, however, this should be managed with the SFTI on-boarding team in a timely manner.

## 7. COMMUNICATION PLAN

A strong focus on communication will continue throughout the Optiq migration, in order to ensure that all clients have access to clear and useful information for the duration of the programme. The following list of communications will be sent to convey key details and clients should be sure to subscribe to any relevant distribution lists.

A dedicated Optiq contact registration form is available on the Optiq website, allowing customers to register as key entry points for all information relating to the Optiq Programme. The form is available [here](#) and we invite customers to complete registration **as soon as possible**.

- **Optiq Website:** a dedicated section of the Euronext website has been created for Optiq, and includes key information on the migration, as well as an exhaustive repertoire of all Optiq communications and documentation published. <https://www.euronext.com/optiq>
- **Info Flashes:** These communications will announce key milestones of the project, and details that all clients should be aware of, such as: documentation publication, the opening of each platform, and confirmed production implementation dates.
- **Optiq Newsletters:** sent on a monthly basis, the newsletters are particularly useful in that they provide a single point of reference each month for key programme milestones, documentation publication dates, and high-level functionality overviews. All clients are encouraged to subscribe to and read each monthly newsletter.
- **Optiq Technical Notes:** Each note will focus on a specific aspect of the technical implementation of Optiq, such as message behaviors and protocol implementation, and is published for clients' technical and development teams.
- **Optiq Notices:** The Optiq support desk will provide programme updates via 'Optiq notices' to inform the market of milestones, EUA environment details, and other important programme updates.
- **Technical documentation:** new and updated documentation will be provided throughout the course of the migration, and will provide clients with the required information to develop and implement Optiq.
- **Bilateral meetings:** Clients will meet regularly with representatives from the Optiq Client Readiness team during each step of the migration, to cover topics like impact assessment, readiness updates, connectivity on-boarding and escalations.
- **Regional Info Sessions:** Information sessions will be organized in the various Euronext locations and will provide an opportunity to learn about the latest updates on the Optiq migration programme and to catch up with fellow market participants. The sessions are open to all members and technology providers.

Note: to subscribe to any of the aforementioned communications, please contact [optiq@euronext.com](mailto:optiq@euronext.com)

## 8. DOCUMENTATION OVERVIEW

This section outlines the various documents that are now available to clients on the Euronext Optiq website.

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### 8.1 OPTIQ MDG CLIENT SPECIFICATIONS

*Document name: EURONEXT CASH AND DERIVATIVES MARKETS – OPTIQ MDG CLIENT SPECIFICATIONS*

This document provides the client message specifications of the Optiq™ Market Data Gateway, specifically focused on the development of Market Data Feed handler. The Euronext Optiq Market Data Gateway (MDG) provides high-speed, real-time market data for Euronext markets. This document relates to the specifications of the new Optiq MDG linked to UTP-Cash and UTP-Derivatives matching engines (phase 1). An update of this document will be provided in early Q4 2016 along with the other specification documents for phase 2. Any potential changes with this version will be clearly indicated, and the same approach will be used for phase 3.

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### 8.2 EXTERNAL USER ACCEPTANCE ENVIRONMENT CONFIGURATION DETAILS

*Document name: EURONEXT OPTIQ™ MARKET DATA GATEWAY EXTERNAL USER ACCEPTANCE ENVIRONMENT*

This document provides all multicast addresses required to access the Euronext Optiq™ Market Data Gateway External User Acceptance (EUA). Only shaped data is provided in the test environment. In order to ensure a Production-like test environment, separate IP addresses and ports are used to replicate the Production 'shaped' and 'unshaped' configuration. The V-EUA and P-EUA Source IP Address ranges are provided in this document and for P-EUA the Source IP Address ranges are provided for the live and standby systems as part of the High Availability mechanism. The Optiq MDG feed configuration file will be provided on a daily basis in XML format and it is required to use the feed configuration file to connect to the feed on a daily basis. Together with the XML Standing Data files for the different Optiq Segments, customers will be able to map which instruments are available in each channel.

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### 8.3 PRODUCTION ENVIRONMENT CONFIGURATION DETAILS

*Document name: EURONEXT OPTIQ™ MARKET DATA GATEWAY PRODUCTION ENVIRONMENT*

This document provides all multicast addresses required to access the Euronext Optiq™ Market Data Gateway Production and Disaster Recovery (DR). The Production Primary (P) and Secondary (S) Source IP Address ranges are provided in this document for the live and standby systems as part of the High Availability mechanism. The Optiq MDG feed configuration file will be provided on a daily basis in XML format and it is required to use the feed configuration file to connect to the feed on a daily basis. Together with the XML Standing Data files for the different Optiq Segments, customers will be able to map which instruments are available in which channel.

## 8.4 CHANGE HIGHLIGHTS - XDP TO OPTIQ

*Document name: EURONEXT CASH AND DERIVATIVES MARKETS - CHANGE HIGHLIGHTS - XDP TO OPTIQ MDG MIGRATION*

The purpose of this document is to explain changes and improvements between the current Euronext Market Data Exchange Publisher (XDP) Cash, Indices and Derivatives market data feed and the new Optiq Market Data Gateway (MDG) messages and processes, for the first migration phase to the Euronext Optiq trading platform. During the first phase of the migration, the Euronext UTP trading engines and order entry gateways (CCG's) remain unchanged and only XDP will be replaced by Optiq MDG, a faster and more efficient Market Data feed. MDG will be harmonized for all Euronext markets and fully MiFID II compliant. This document relates to the specifications of the new Optiq MDG linked to UTP-Cash and UTP-Derivatives matching engines (phase 1). An update of this document will be provided in early Q4 2016 along with the other specification documents for Phase 2 of the Optiq migration. Any potential changes with this version will be clearly indicated, and the same approach will be used for the Phase 3. MDG will be harmonized for all Euronext markets and fully MiFID II compliant.

This document will describe:

- Technical evolutions
- Functional evolutions
- Mapping between existing XDP Cash, Indices and Derivatives and new Optiq MDG messages
- Message sending logic and mapping
- Evolutions made at the message and field level

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## 8.5 UTP TO OPTIQ MDG KINEMATICS

*Document name: EURONEXT CASH AND DERIVATIVES MARKET - UTP TO OPTIQ MDG TRANSITION KINEMATICS SPECIFICATIONS*

The purpose of this document is to explain the changes and the improvements between the current Euronext Market Data Exchange Data Publisher (XDP) and the Optiq Market Data Gateway (MDG) messages and processes, for the first phase of the migration. During the first phase of the migration, the Euronext UTP trading engines and order entry gateways (CCG's) remain unchanged and only XDP will be replaced by Optiq MDG. During the transition phases, while Optiq MDG is still connected to the Cash and Derivatives Euronext UTP matching engines, all trading functionalities remain the same and behaviors are not altered. As such, the message sequencing logic for Market Data will still be driven by the Euronext UTP matching engine during the transition phases. It should be noted, however, that this is not necessarily the logic that the full Optiq platform will deliver, once the Cash matching engine migrates onto Optiq in Phase 2, and Derivatives in Phase 3. This document provides an overview of messages exchanged between the Universal Trading Platform (UTP), order entry gateways (CCG's) and the Market Data Gateway (MDG).

It includes:

- Typical trading situations and the corresponding public and private messages that are sent during the trading day.
- The names of the messages that are sent.
- The events that trigger the transmission of messages

## **8.6 OPTIQ MDG FILE SPECIFICATIONS & SAMPLE FILES**

*Document name: EURONEXT CASH AND DERIVATIVES MARKETS – OPTIQ MDG FILE SPECIFICATIONS*

This specification document details the Referential Data FTP and HTTPS Server for Euronext, to be used in conjunction with the Optiq MDG Client Specifications. The Servers provide full referential data for the Euronext market, as well as feed configurations and intraday trades with their MiFID II flags. Several sample files are provided to help facilitate testing and development. As they are samples, only the structure and the fields should be taken into consideration, and not the content of the fields.

## 9. SUPPORT

A Support Desk dedicated to the Optiq programme was launched in June 2016, and will be available to customers for the duration of the Optiq implementation programme. It has been set up to answer customers' queries related to the Optiq programme, to send information to customers related to Optiq, to assist customers in their testing and validation on the EUA environment, and to provide follow-up on client conformance testing.

The Optiq Support Desk has been set up to ensure customer readiness and will be the primary point of contact for clients throughout the migration. The scope of the Support Desk will include:

- Answering customer queries about the Optiq programme, such as technical and functional questions, clarifications on the specifications and documentation, questions relative to the migration and associated dates, and questions regarding connectivity.
- Sending information about Optiq to customers, such as the monthly newsletters, regular technical notes, programme Info Flashes and updates to the dedicated Optiq web page.
- Assisting customers in their testing and validation on EUA environment by generating test orders, trades and market data, matching client orders upon request, and facilitating testing on the platform by creating Production-like conditions
- Coordination and follow-up on customer conformance testing by ensuring that clients have made the required developments for the new Optiq platform and providing support during the conformance testing periods.

### SUPPORT DESK INFORMATION

**Contact details:** Optiq Support Desk  
Tel: +33 1 70 48 25 55  
Email: [optiq@euronext.com](mailto:optiq@euronext.com)

**Opening hours:** Monday – Friday: 09:00 to 18:00 CET