

# MIT501 – GUIDE TO TESTING SERVICES

Issue 22

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**LONDON  
STOCK  
EXCHANGE**

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## Disclaimer

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# 1.0 Introduction

London Stock Exchange provides a range of testing services to customers developing and testing software applications for use on its Millennium Exchange Live Service<sup>1</sup>.

## 1.1 Purpose

The purpose of this document is to provide an overview of the Customer Testing Services available on Millennium Exchange and how to access them.

When read in conjunction with the Millennium Technical Specifications<sup>2</sup> and the other available testing documentation, these documents are intended to provide all the necessary information customers require to develop, test and trial their software before connecting to the Live Service.

## 1.2 Readership

This document is relevant to software developers, system testers and other technical staff who are involved in testing and developing applications for use in the Live Service. It is also relevant to customers who want to use the Customer Development Service (CDS)<sup>3</sup> for testing trading strategies or for training purposes.

## 1.3 Document series

This document is part of a series of Customer Testing documents that are available to customers. The other documents are:

- MIT 502 Guide to Application Certification
- MIT 503 Certification Report
- GTP005 Testing Services Guide

These documents form part of a series of technical documentation available to customers who are developing software to connect to the Live Services. For reference, the full range of Millennium technical documents are available on London Stock Exchange's website: <https://www.londonstockexchange.com/resources/trade-resources?tab=technical-library>

GTP technical documents are available at: <https://www.lseg.com/areas-expertise/technology/group-technology/group-ticker-plant>.

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<sup>1</sup> London Stock Exchange's Millennium Exchange Live Trading Service is referred to throughout this document as 'The Live Service'.

<sup>2</sup> The Millennium Technical Specifications includes all protocols including Group Ticker Plant.

<sup>3</sup> London Stock Exchange's Millennium Exchange Customer Development Service is referred to throughout this document as 'CDS'.

## 1.4 Document history

This document has been through the following iterations:

Issue	Date	Description
8.0	23 May 2011	The eighth issue of this document published via London Stock Exchange's website and distributed to customers.
8.1	4 July 2011	Minor update to previous issue to include Section 11 – Testing Services on Production IP Addresses.
9.0	23 September 2011	The ninth issue of this document published via London Stock Exchange's website and distributed to customers.
10.0	20 March 2011	The tenth issue of this document published via London Stock Exchange's website and distributed to customers. Minor revisions to several sections.
10.1	9 August 2012	Minor update to previous issue Section 9.2. Heartbeat Generator and TCP Responder now available on the RNS service.
11	25 October 2012	Minor revisions to several sections. Due to the amount of formatting changes, this version will not have amendments marked with a side bar as described below.
12	1 February 2013	Updated LCON policy
13	15 March 2013	Removed reference to FIX/FAST market data. Added clarification to LCON policy section for NSP clients.
14	15 January 2014	Section 3.4.7 Added references to CDS EDSP Auction schedule.
15	7 July 2014	Section 3.4.4 Added behaviour description of sponsored access enabled native IDs
16	31 October 2014	Amended to reflect rebranding of ITCH to MITCH
17	5 December 2017	Added change for MiFID II: 4.0 Added section for production-like CDS environment. 5.1 Updated LSE Certification policy 5.2 Added section on Algorithm conformance
18	1 July 2019	Document updated to reflect the changes following the introduction of new internal processes to update the CDS environment 2.0 Removed reference to HVS and test after normal market hours 3.2 Removed reference to extended hours 3.3 Clarify that the clearing configuration on CDS may be different than production. Removed reference to instrument synchronisation with production. 3.4 Removed reference to the Closing Price Crossing session. 3.4.6 Removed the Post Close Cross section 3.4.7 Now section 3.4.6. The EDSP auctions now follow the production schedule 3.5 Removed the extended trading hours segments. Added Periodic Auction Call to the SETS schedule. 4.0 Added information related to reference data for Legacy CDS 10 Section removed as participant test weekends are no longer available
19	5 July 2019	As per service announcement 001/05072019, the MITCH market data service will be decommissioned on CDS effective 22 July 2019
20	17 June 2020	Removed reference to MITCH market data service Updated links Amended SETS Start of Trading Amended timings for ODTT & TEST segments
21	2 February 2024	Updated to reflect the new customer conformance tool.
22	1 February 2025	Addition of liquidity generation guide details.

Within this document, where amendments have been made to the previous issue, these changes will be identified by highlighting the changes in **red**.

## 1.5 Contacts

Please contact your Technical Account Manager if you have any questions about the testing services outlined in this document. If you are unsure who your Technical Account Manager is, please use the details below:

- Telephone: +44 (0)20 7797 3939
- Email: [londontam@lseg.com](mailto:londontam@lseg.com)

## 2.0 Service overview

The London Stock Exchange offers a wide range of testing services. Customers can use these services to:

- Test the functional interface between their software applications and London Stock Exchange Millennium Gateways
- Certify their software applications for use on the Live Service
- Test trading strategies against a simulation of the Live Service
- Provide market participants with a safe training environment away from the Live Service
- Test their application's ability to recover from service disruptions

All the above service offerings are available on the Millennium Exchange CDS, described in the next section.

## 3.0 Customer Development Service

### 3.1 Service description

The CDS provides a fully functioning live simulation of the Live Service against which our customers can develop, test and run their Trading and Information applications.

The CDS also provides model-based testing scenarios to help customers with their development efforts.

### 3.2 Access to the Customer Development Service

To access the CDS, customers will be required to complete a CDS Order Form and send their requirements to their Technical Account Manager or the Technical Account Management team. Customers will then be sent full details of their CDS technical configuration. Amendments can be requested through London Stock Exchange's Technical Account Management team.

The Millennium Exchange IP address information is provided in the MIT1001 Connectivity Guide on London Stock Exchange's website: <https://www.londonstockexchange.com/resources/trade-resources?tab=technical-library>

CDS sessions can be pre-booked and allowed access to the service for a full trading day. For those customers that test regularly or appreciate the convenience of uninterrupted access, a Continuous Access Service is offered as a cost effective and efficient means of testing.

The CDS Order Form and Price List can be found on London Stock Exchange's website at: <https://www.lseg.com/areas-expertise/technology/market-connectivity/customer-certification-and-testing-services>

### 3.3 Live Simulation Service

The Live Simulation Service replicates the full market structure of the Live Service, including all segments, sectors and trading sessions. Market maker registrations, participant details and clearing configuration may vary from the Live Service.

All Trading Services available on the Live Service are replicated on the CDS. The full range of Trading Services are detailed on London Stock Exchange's website at: <https://www.londonstockexchange.com/trade/equity-trading>

Market hours are the same as the Live Service.

## 3.4 Model based testing

The CDS environment has been enhanced to model specific scenarios on a more frequent basis than customers will encounter on the Live Service, such as service disruptions. Other scenarios are added from time to time to support the introduction of new functionality. Customers can use these scenarios to assist with their testing and development. This section describes the modifications.

### 3.4.1 GTP forced failure

For GTP details, please refer to GTP005 – Testing Guide available at: <https://www.lseg.com/areas-expertise/technology/group-technology/group-ticker-plant>.

### 3.4.2 Trading Gateway failover and recovery

To support customers with their disaster recovery testing, every Friday between 15:00-15:45 GMT, the following components will be failed in turn, in sequence:

- Primary FIX Trading Gateways
- Primary FIX Post Trade Gateways
- Primary FIX Drop Copy Gateways
- Selected Native Trading Gateways

Customers connected to a Primary Gateway during these times can detect the disconnection and re-connect to their designated Secondary Gateway. Technical information regarding failover and recovery is provided in MIT601 – Guide to Disaster Recovery.

Customers will remain connected to the Secondary Gateway for the remainder of the day.

### 3.4.3 Service interruption on the Native Interface Recovery Channel

So that customers can test receipt of the System Status message, a service interruption will be simulated for one minute, every hour on the hour from 08:00-16:00 GMT for every trading day.

In case of service interruption on the Native Gateway Recovery Service a new 'System Status' message will be sent to all logged in clients to indicate the unavailability and subsequent availability of the partition.

Clients submitting a new 'Missed Message Request' during that time will receive a 'Missed Message Request Ack' with 'ResponseType = 3 (service unavailable)' from the Native Gateway.

### 3.4.4 Service interruption during own order book download on the Drop Copy Service

To support customer testing of the unsolicited Execution Report, a service interruption will be simulated for one minute, every hour on the hour, from 08:00-16:00 GMT for every trading day. Customers will receive an unsolicited Execution Report if the Drop Copy gateway was servicing their Order Mass Status Request during the interruption.

Sponsored access enabled Native ID's will be logged out from the Native Real Time Channel, even if order cache instances of other partitions are up and running. The string "System unavailable (to sponsored users)" will be sent as the reason in the log out message.

Any new logins will be rejected via a logon response message with the reject code 9905 ("System unavailable (to sponsored users)") until the order cache instances of that partition are up. This lasts for approximately one minute in simulation, after which sponsored access enabled Native ID's can reconnect.

### 3.4.5 EDSP auctions

FTSE 100 and FTSE 250 expiry auctions will now follow the production schedule.

Index	Day of expiry	Auction call
FTSE 100	The third Friday of the month	Five-minute call at 10:10 am GMT
FTSE 250	The third Friday of Mar, Jun, Sep and Dec	Five-minute call at 10:10 am GMT

### 3.5 Service hours

The service hours for the CDS match those on the Live Service, with identical trading session timings. These are detailed in the Millennium Exchange Business Parameters document available on London Stock Exchange's website at: <https://www.londonstockexchange.com/resources/trade-resources?tab=technical-library>

The service hours for the SETS service are shown below for reference.

Time (GMT)	Description
05:05-07:50	Start of Trading
07:50-08:00	Open Auction Call
08:00-12:00	Continuous Trading
12:00-12:02	Periodic Auction Call
12:02-16:30	Continuous Trading
16:30-16.35	Closing Auction Call
(After Closing Auction)	Closing Price Publication (CPP)
(After CPP)	Closing Price Crossing (CPX)
(After CPX)	Post Close Session

### 3.6 Maintenance days

On occasion London Stock Exchange will have to close the CDS to perform upgrades or maintenance activities. Customers will be informed of maintenance days and early CDS closures via Service Announcements. To register, please follow the instruction available on London Stock Exchange's website:

<https://www.londonstockexchange.com/products-and-services/technical-library/service-announcements/service-announcements.htm>.

Customers should also note that when the CDS environment must be shut down and restarted, message sequence numbers may be reset for both Trading interfaces and Market Data interfaces. The Logon Reply message may contain the message sequence number of "1".

### 3.7 Reference data

An FTP & SFTP flat file-based Reference Data download service has been introduced as part of Millennium Exchange. All customers will also be required to test against this service prior to go-live. Further information is available in MIT401 – Guide to Reference Data Services.

### 3.8 End to end testing

Trades executed on the CDS may be sent to a clearing house, but this will need to be pre-arranged well in advance. Please liaise with your Technical Account Manager for more information.

### 3.9 Liquidity Generation for LSE Customer Testing in CDS

LSE offers liquidity on a selected range of instruments to support customer testing. The Liquidity generation scheme will encompass both aggressive and passive liquidity, enabling trading participants to test order entry while also publishing order executions for customer testing of GTP market data.

Please find the list of Instruments in the LSE CDS – Instrument Liquidity Profiles document [here](#).

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## 4.0 Production-like CDS environment

London Stock Exchange has introduced a production-like CDS environment (Legacy CDS). The production-like CDS environment will be continuously aligned with the live service in terms of software version and reference data (instrument, participants, etc...). Instrument reference data will be updated on a weekly basis. Customers should download the production reference data files on Monday morning to be used with Legacy CDS for that week.

All trading services available on the live service will be replicated on the production-like CDS environment.

## 5.0 Conformance testing

### 5.1 Application conformance testing

Before connecting to the Live Service, customers are required to certify that their software applications fully conform to London Stock Exchange's Millennium Technical Specifications. Customers should use the Customer Conformance Tool to complete the certification test.

Customers are required to recertify their software in accordance with London Stock Exchange's certification policy whenever:

- The customer modifies the software in any way that directly impacts a London Stock Exchange interface.
- The exchange venue upgrades its production environment to a later version of software.
- The customer is requested to re-certify their application by the relevant venue.

Full details of the certification process are available in the following documents:

- **MIT502** – Guide to Application Certification
- **MIT503** – Certification Report

### 5.2 Algorithm conformance testing

From 3 January 2018, London Stock Exchange requires firms to self-certify that all algorithms used on London Stock Exchange have been tested. In accordance with the revised MiFID II release of London Stock Exchange's Rulebook, any order message specifying the use of an algorithm as the decision maker for that order by way of a short code will be taken as confirmation from a Member Firm that the algorithm has been adequately tested.

Member Firms will be required to populate the long code associated with the short code, complete with a description of the testing undertaken, in the Member Portal by the end of the next trading day. Firms may, but are not required to, use London Stock Exchange's CDS environment to self-certify their algorithms. London Stock Exchange will not perform conformance testing of client algorithms.

## 6.0 Sponsored Access Test Service

Sponsored Access Customers have additional mandatory testing requirements for Sponsored Users (Native Gateway) and Sponsoring Firms (Drop Copy Gateway).

Sponsored Users and Sponsoring Firms will need to ensure they are using certified software on the Native Gateway for Order Entry (Sponsored User) and the Drop Copy Gateway (Sponsoring Firm). Both User and Firm will need to demonstrate they tested the functions associated with a daily life cycle (DLC) of the service on the

CDS environment prior to go-live on production. The DLC test is conducted with the Sponsoring Firm, the Sponsored User and a member of the Market Access team.

Full details of the testing services and requirements can be found in the document MIT 701 – Guide to Sponsored Access: <https://www.londonstockexchange.com/resources/trade-resources?tab=technical-library>

## 7.0 Group Ticker Plant Testing Service

London Stock Exchange Group launched the Group Ticker Plant (GTP) which is designed to revolutionise the real-time market data services, delivering ultra-low latency feeds through new technologies and facilitating the launch of new products and services.

London Stock Exchange has also provided a testing service in the CDS environment. The testing service will allow customers the ability to interact with the GTP multicast data prior to accessing the Live Service environment.

Further information on the GTP testing services can be found in the GTP005 – Testing Services Guide, available from London Stock Exchange’s website at: <https://www.lseg.com/areas-expertise/technology/group-technology/group-ticker-plant>

## 8.0 Production Test Instruments Service

The Production Test Instruments (PTIs) test facility allows customers to enter test transactions in Live Service test segments, using their production systems.

The following table details the test segments that are available for entering test transactions:

Market type	Market segment	Market sector
Order driven	ODTT	ODTT
Quote driven	TEST	DOTS

By entering a small volume of transactions in PTI instruments on the Live Service, customers can verify live system configurations without the need to enter “real” transactions. Testing is confined to 39 test securities that are available during the hours below:

### ODTT segment:

05:06-07:45 GMT (Continuous Trading)

07:45-17:15 GMT (Post Close)

### TEST segment (test securities for SEAQ):

05:06-08:00 GMT (Pre-Mandatory)

08:00-16:30 GMT (Mandatory)

16:30-17:15 GMT (Post-Mandatory)

Customers are allowed to enter all applicable trade reports in those segments. Please note that PTI is not intended for performance testing and must not be used to enter large volumes of transactions.

Full details of the instruments can be found within the daily reference data flat-file available from the FTP/SFTP site.

*\*As a rule, testing is not permitted in the London Stock Exchange’s production environment. This service is available to customers to enter test transactions prior to the start of the trading day*

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## 9.0 Live Connectivity Testing Services

### 9.1 GTP Production Heartbeat Generator

For details on the GTP Heartbeat Generator, please refer to GTP005 – Testing Guide available on LSEG's website: <https://www.lseg.com/areas-expertise/technology/group-technology/group-ticker-plant>.

### 9.2 Millennium Production TCP Responder

The TCP Responder is activated from 18.30-23.00 GMT from Monday to Thursday following the Production Service shutdown and will use the existing Production IP addresses. The TCP Responder will also be activated every weekend from Saturday at 22:00 GMT until Sunday 22:00 GMT.

The TCP Responder responds to customer TCP messages such as Telnet to all Primary and Backup Trading Gateways.

The Millennium Production IP addresses referenced above can be found in the MIT1001 Connectivity guide on London Stock Exchange's website: <https://www.londonstockexchange.com/resources/trade-resources?tab=technical-library>

### 9.3 GTP Production TCP Responder

For details on the GTP TCP Responder, please refer to GTP005 – Testing Guide and GTP004 – Parameters Guide for GTP IP information. Both documents can be downloaded from LSEG's website: <https://www.lseg.com/areas-expertise/technology/group-technology/group-ticker-plant>.

**Customers are reminded that London Stock Exchange may broadcast test data from its Production environment at the weekends which should be discarded and not processed.**

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## Appendix A: CDS connectivity

### 1. Connectivity

Physical access to the Millennium Exchange CDS service is available in the following ways:

- Extranex backup circuit
- Exchange hosting
- VPN Developer service
- Network Service Provider (NSP)
- Vendor Access Network (VAN)
- Customer Managed Connectivity (CMC)

### 2. Trading Gateway connectivity

The FIX Trading, Post Trade and Drop Copy interfaces have one IP address acting as a Primary and one IP address acting as a Backup. The Backup can only be connected for failover testing between 15:00-15:45 GMT on a Friday or if there is a failure of one of the Primary interfaces.

Native Trading customers can choose an IP for their Primary connection and an IP for their Secondary.

### 3. Market Data Gateway connectivity

Customers can request to have GTP Market Data channels enabled on their CDS connectivity. All feeds will be disseminated on multicast channels. Additionally, clients can request Replay and Recovery CompID's to test the ability to re-request messages and recover from large-scale data loss.

Clients can request CompIDs to connect to relevant Replay and Recovery Services.

Each CompID will be allocated a Primary and Secondary IP.

### 4. CDS IP Addressing

CDS IP addresses can be found in the MIT1001 Connectivity Guide on London Stock Exchange's website: <https://www.londonstockexchange.com/resources/trade-resources?tab=technical-library>

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