E-Bulk Connectivity Test Plan

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1 INTRODUCTION

1.1 Background

The DBS is introducing a facility to enable applications to be bulk-submitted electronically and to return information regarding the result of those applications by a similar means. This facility is known as the "E-Bulk" interface.

The Registered Bodies (RBs) who meet the E-Bulk criteria will be invited to use the E-Bulk facilities. RBs that are using E-Bulk will be referred to as E-RBs. The RBs who wish to use the E-Bulk facility will sign the Memorandum of Understanding in the Interchange Agreement to initiate the process of becoming an E-RB.

Use of the E-Bulk interface will alleviate the need for the production and mailing of paper forms by E-RBs and form scanning, and data keying by the DBS. It also makes it possible to reduce the volume of printed Certificates sent by post to the E-RBs.

1.2 Purpose

Before an RB can connect their system to the production DBS E-Bulk interface, it must successfully exit a phase of DBS system testing and DBS connectivity testing. The purpose of this document is to provide RBs with an overview of the connectivity testing that DBS requires and to inform planning activities. The document defines the approach to testing and is based on [IEEE829] and as such it will identify the scope of testing, pass/fail criteria and environmental requirements for the test phase. The audience for this document includes the technical staff of RBs who will plan, manage and execute the testing. Note that the document covers RB systems that connect to the CJSE both via the Internet (FTPS) and via the GSi (FTP).

1.3 Terminology

Term	Meaning
E-Bulk	The term that has been given to the interface described in this document, named as such because it provides an electronic mechanism for submitting applications in bulk (i.e. in batches, as opposed to one at a time). This is analogous to the current practice of sending paper DAFs in bulk by post.
eBulkApplicationsBatch (CRB01)	XML file generated by RB system and sent to CRM that represents a batch of up to 50 eBulkApplications.
eBulkApplicationsBatchRejection (CRB02)	XML file generated by CRM that represents a file level rejection of a CRB01 message. This file is sent to the RB system that generated the original CRB01 message.
eBulkApplicationReceiptsBatch (CRB03)	XML file generated by CRM to indicate whether individual eBulkApplications from a particular RB have passed or failed initial validation. This message is generated either on a regular interval or when the number of eBulkApplications from a particular RB passes a

	predefined threshold.
eBulkResultsBatch (CRB04)	XML file generated by CRM to indicate the results of individual eBulkApplications (blank or non blank) from a particular RB. This message is generated either on a regular interval or when the number of eBulkApplications from a particular RB passes a predefined threshold.
eBulkApplication	An application sent by electronic means. In the context of this document, this refers to an application sent via the E-Bulk interface.
eBulkResult	An electronically delivered response to an eBulkApplication. An eBulkResult indicates, to an RB, either that a Certificate contains no information or that they must await the applicant producing their Certificate to the RB.
XML Schema	A standard for defining the format of XML documents. The standard provides a means by which tools can know the correct format of a document, enabling them to provide generic operations such as validation.
System Test	System testing of software is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black box testing, and as such, should require no knowledge of the inner design of the code or logic.[1]
CJSE	Criminal Justice System Exchange. The GSi message broker platform utilised by the e-Bulk solution and owned by OCJR.
OCJR	Office for Criminal Justice Reform

1.4   Related Documents

Document Name	Abbreviation	Description
Interchange Agreement	[IA]	States the agreed business level agreement that governs the use of the end to end solution between RBs and the DBS.
Business Process Document	[BPD]	Defines the information exchange between the end points (RB and DBS systems) and the business process that surrounds and controls it.
Interface Control Documents	[ICD]	An OCJR document that defines the specific configuration of message delivery and operational interface protocols that will be used by end points (e.g. RB systems).
Message Delivery Interface Documents	[MDI]	An OCJR document that describes the message transport mechanism provided by the CJSE that enables an end point to communicate with the CJSE.

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[1] IEEE Standard Computer Dictionary 1990

Document Name	Abbreviation	Description
Code of Connection CJSE-RB (GSi)	[CCG]	An OCJR document; the Code of Connection security specification which the Registered Body system must adhere to in order to connect to the CJS Exchange via the Government Secure Intranet (GSi). It is technically simpler, and therefore preferable, to connect via GSi if the RB is already connected to the GSi.
Code of Connection CJSE-RB (Internet)	[CCI]	An OCJR document; the Code of Connection security specification which the Registered Body system must adhere to in order to connect to the CJS Exchange via the Internet.
IEEE Std 829-1998	[IEEE829]	Standard for Software Test Documentation.
eBulk-CJSE OnBoarding Document	[OBD]	An OCJR document; the guidance on tested FTPS clients and FTPS configuration.

2   SCOPE OF TESTING

This testing is scoped to cover the connection established by the RB system to the pre production CJSE and the transfer of XML messages between the CJSE and the RB system. The testing needs to prove that the RB system is compliant with the E-Bulk requirements as set out in the [BPD], [ICD], [MDI], and [IA].

2.1   Features To Be Tested

- Basic connectivity testing – proving that a TCP/IP socket connection can be established between the RB test environment and the pre production CJSE.
- For RBs connecting from the Internet, the configuration of the FTPS client and installation of OCJR's client and CA digital certificates will be tested.
- For all RBs, the configuration of the FTP(S) clients with OCJR FTP username and password will be tested.
- The transfer of CRB01, CRB02, CRB03 and CRB04 messages between the RB test environment and the pre production CJSE using the FTP(S) client.
- The transfer of CRB01, CRB02, CRB03 and CRB04 messages between the RB test environment and the pre production CJSE using the RB test system as envisaged in live running i.e. automated message generation and polling of the exchange.
- The file transfer control mechanisms employed by the exchange as set out in the [ICD] and [MDI] documents.

2.2   Features Not To Be Tested

The following test coverage is deemed out of scope for the purpose of this test phase:

- Functional testing of the RB system's data capture component.

- Exhaustive functional testing of the RB system's message generation component.
- Functional testing of the RB system's message integrity component.
- Functional testing of the RB system's message digestion component.
- Functional testing of the RB system's schema and business rule validation component.
- Performance testing of the RB system.
- Security or penetration testing of the RB system.
- Other non functional testing of the RB system.

3   APPROACH

This test phase is conducted by the RB organisation with collaboration from OCJR. Ideally, this testing should occur after the RB system has passed formal DBS system testing. The reason for this is that the RB system should be complete and stable to allow the testing to progress smoothly and prevent expensive retesting. There may be exceptions to this guidance whereby DBS connectivity testing precedes DBS system testing. These exceptions are likely to occur in situations where there are scheduling constraints in terms of obtaining a timely slot for testing with OCJR and where the RB provides firm guarantees to DBS regarding the readiness of their system.

Prior to test execution, the following actions must have happened with respect to the RB:
- The RB receives the **DBS Connectivity Test Pack** consisting of this document, the Connectivity Test Specification and the Connectivity Test Summary Report
- The RB receives the **DBS E-Bulk RB Onboarding document [OBD]**. This document gives guidance on how to configure the CURL command line, NSoftware Java library and NSoftware .NET FTP clients to successfully connect to the exchange. This document may be augmented by a degree of technical support from OCJR to help RBs configure their clients. Note that there will be limited technical support available to RBs who do not use the clients set out in this document as OCJR may not have experience with the technologies in question.
- The RB receives the **IP Address/domain name** and **port number** (detailed in the OBD for internet RB's) of the pre production CJSE that will be used for connectivity testing. These items are required to configure the RB's firewall, telnet and FTP clients to establish a connection to the exchange.
- Internet RBs receive a test **OCJR CA certificate** and **client digital certificate (SSL)**. These items are required to successfully configure the RB's FTPS client and enable the RB's system to establish a secure network connection to the exchange from the Internet.
- The RB receives test **FTP user name and password** from OJCR to enable the RB to access the pre production CJSE FTP server.
- DBS provides the RB and OCJR with a **test RB reference number** from that will be used during test execution.
- OCJR provide the RB with a **test RB system ID** that will be used to set up directories in the pre production CJSE.
- The RB receives two test **CRB01 XML files** from the DBS for use in test execution.
- The RB makes any required changes to its network to enable a connection to be established to the pre production CJSE e.g. opening its firewall with the CJSE IP address. For GSi RBs, different configuration may be required and advice should be sought from Cable and Wireless, the GSi provider, and from OCJR.

Prior to test execution, the following actions must have happened with respect to the OCJR:

- OCJR receive the **RB IP Address**.
- OCJR open the firewall for the RB IP Address.
- OCJR receive two sets of **2 x CRB02, 2 x CRB03 and 2 x CRB04 XML files** (12 files in total) from the CRB for use in test execution.
- OCJR have created an FTP account for the test RB as well as generating certificates if required. Note that this includes configuring the pre production CJSE e.g. directory structures, MQ queues etc.
- DBS provides OCJR with the **test RB reference number** from that will be used during test execution to allow the pre production CJSE to be configured correctly.
- OCJR receive a completed copy of [CCI] or [CCG] and the OCJR security accreditor is content that a connection be established to the RB system.
- Contact details of RB systems administrator to allow a conference call to be established during test execution.

The test execution itself has three main parts:
1. **Achieving Basic Connectivity**. The goal of this testing is to prove that a TCP/IP socket connection can be established between the RB test environment and the pre production CJSE via a telnet client.
2. **FTP(S) Client Configuration and Testing**. The goal of this testing is to prove that the RB system's FTP(S) client can be correctly configured and username provided by OCJR and that the FTP(S) client can be used to transfer files between the RB environment and the exchange. The [OBD] provides technical guidance on how to configure certain FTP(S) clients and should be used by RB technical staff to assist in this activity. The RB will initiate the file transfer by moving 2 CRB01 files provided by the DBS to their "in/CRB01" directory on the exchange. Once uploaded, the "in/CRB01" directory will be polled by the CJSE. OCJR will provide the files to DBS as test evidence. OCJR will then place two CRB02, two CRB03 and two CRB04 response files in the DBS "in" directory[2]. Note that these files will have been provided to OCJR by the DBS prior to testing. The "in" directory will be polled by the CJSE and the files will be moved to the relevant RB "out" directory. The RB will then use their FTP(S) client to download the files and upload to the "out" directory flag files to confirm successful receipt. Once a flag file is received OCJR internal housekeeping will move the files to the 'processed' directory. The files will be sent to DBS as test evidence.
3. **RB System File Transfer Testing**. This testing is very similar to the previous stage except that the RB's system will be responsible for automated file transfer rather than manual use of the RB FTP(S) client. This will prove that the FTP(S) has been correctly integrated into the RB system. Furthermore, the file transfer requirements set out in the [ICD] and [MDI] documentation will be exercised e.g. never download a file with a "-" suffix etc. Note that DBS will provide the CRB02, CRB03 and CRB04 response files and the RB system is required to generate the two CRB01 files for transfer to the CJSE. After transmission all files will be sent to the DBS for test evidence.

The testing will be conducted during a conference between the technical staff and testers of OCJR and the RB. It is likely that there will be DBS representation on the call. There are a number of ways the testing activities can be phased and this will be at the discretion of OCJR. For instance, the initial firewall changes may be coincident with the basic connectivity

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[2] It is recognised that a CRB01 file should never result in a response of a CRB02, CRB03 and CRB04 file however as this testing is focused solely on exercising the transport layer it is deemed appropriate to construct a test in this way.

testing and so one call would be required for these activities and then a second would be scheduled for the file transfer activities.

Once the testing has been successfully completed, a basic Test Summary Report will be completed by OCJR and the RB to confirm that each step has been passed. Furthermore, the files that have been moved through the CJSE will be provided to the DBS for test evidence. The DBS will inspect these files to ensure they match the files provided at the start of testing. The DBS will provide unique files for each RB and so by comparing the files received from OCJR and the RB with the originals, DBS can reliably confirm the success of the testing.

3.1   Data Preparation

The DBS will provide the RB with 2 CRB01 files and OCJR with 2 x CRB02, 2 x CRB03 and 2 x CRB04 XML files for FTP(S) Client Configuration and Testing.
The DBS will provide OCJR with 2 x CRB02, 2 x CRB03 and 2 x CRB04 XML files for RB System File Transfer testing.
The RB will generate two CRB01 XML files as part of RB System File Transfer testing.

4   ITEM PASS/FAIL CRITERIA

This test phase will be considered successful if all test conditions are successfully executed and DBS confirm the test evidence provided is satisfactory. Failure to execute any condition will result in overall failure of the testing. The only exception to this is when prior agreement has been reached with DBS to omit formal FTP(S) Client Configuration and Testing and move straight to RB System File Transfer Testing.

5   SUSPENSION CRITERIA AND RESUMPTION REQUIREMENTS

Suspension Criteria:
- Failure to establish a TCP/IP socket connection between the RB environment and the pre production CJSE within 1 hour.
- Failure to establish a FTP(S) connection between the RB environment and the pre production CJSE within 1 hour.
- Failure to upload or download a file as planned within 30 mins.
- Failure of the CJSE to move files through the exchange within 30 mins.

Resumption Criteria:
- For RB faults, DBS require firm guarantees and evidence from the RB that the problem has been resolved and that a new conference call with OCJR should be scheduled for retesting.
- OCJR faults are likely to arise from configuration problem of the CJSE or GSi, DBS require confirmation that the configuration has been corrected before a new conference call with the RB should be scheduled for retesting.

6   TEST DELIVERABLES TO BE PRODUCED

Deliverable	Responsibility

Connectivity Test Plan (this document)	Produced by DBS.
Connectivity Test Specification.	Produced by DBS.
Connectivity Test Summary Report	Templates produced by DBS and subsequently populated by the RB and OCJR.
Test XML files	Initially provided by DBS and then returned to DBS after testing by OCJR and the RB. The files returned include two CRB01 files generated by the RB system during testing

7   RESPONSIBILITIES

Group	Responsibility
CRB	• Coordination of RB and OCJR activities including scheduling testing conference calls. • Coordination of flow of information between the RB, DBS and OCJR prior to testing e.g. IP addresses, test data, test documentation etc. • Review test evidence and completed Test Summary Report to sign off the testing.
RB	• Provides relevant information prior to testing e.g. IP address • Conduct test execution and resolve any defects • Supply DBS with XML files as test evidence. • Confirms successful completion of testing and completes relevant sections of the Test Summary Report.
OCJR	• Provides relevant information prior to testing e.g. IP address, user names etc. • Configure the pre production CJSE prior to testing e.g. create users, password and accounts for the RBs • Conduct connectivity testing and resolve any defects • Provide limited technical support to the RBs during connectivity testing • Supply DBS with XML files as test evidence. • Confirms successful completion of testing and completes relevant sections of the Test Summary Report.

8   SCHEDULE

Once the testing prerequisites (e.g. exchange of IP addresses and firewall changes) have been completed then a conference call between the RB, OCJR and DBS will be scheduled by DBS so that the test execution can be conducted simultaneously.

If the testing goes smoothly, the execution may be of short duration (one hour), however if there are issues then the testing may need to stop for defects to be fixed or configuration to be changed and then the conference call would need to be rescheduled by DBS.

9   ENVIRONMENTAL REQUIREMENTS

The RB test environment must be representative of the environment that is intended to be used in production. This is to ensure that the configuration and network changes undertaken during testing are similar to the changes that will be required in the production environment. The RB must highlight any differences between the test and production environments to the DBS prior to testing. Furthermore, the same environment is expected to be used for both connectivity testing and for system testing. The basis for this expectation is:

- The CJS Exchange is connected to the Government Secure Intranet (GSi), and therefore, the systems which connect to the Exchange must adhere to the security protocols listed in the Code of Connection CJSE-RB (Internet) and Code of Connection CJSE-RB(GSi) documents. Since achieving this security standard is non-trivial it is expected the Registered Body will wish to configure as few environments as possible to this standard.
- Connectivity testing encompasses the configuration changes required to connect to the CJSE; connectivity testing would have to be repeated if a different environment were used for system test.

If the Registered Body wishes to use an environment other than the planned system test environment then the RB project manager should contact the DBS to assess any risk this may represent.

10   RISK, ASSUMPTIONS, ISSUES AND DEPENDANCIES (RAID)

10.1 Risks

Risk	Description	Mitigation	Owner
1	Technical support offered to RBs is not adequate. The information contained in the [OBD] may not fully cover all configuration details for the recommended FTP clients and these skills may not be readily available within OCJR.	Ensure that the [OBD] is maintained and updated with any lessons learned after each tranche of testing.	DBS
2	RB uses an FTPS client that has not been tested by OCJR i.e. not covered in the [OBD]. The risk is that the client will be unsuitable or, more likely, the skills and experience required to correctly configure the client are not readily available either in the RB or OCJR organisation, causing the testing cost and duration to increase.	Emphasise early in the RB project lifecycle, the recommendation to use an OCJR tested FTP client as it is the RB's responsibility to configure other FTP clients with limited support from OCJR.	DBS

10.2 Assumptions

None Identified.

10.3 Issues

None Identified.

10.4 Dependencies

Dependency	Description
1	Obtaining a testing slot in the pre production CJSE
2	The RB will provide adequate tester and technical resource to enable the test schedule. The RB will also provide a suitable test environment to support the test execution
3	The DBS will provide a point of contact to support the exchange of information between the RB and OCJR prior to testing.

11 ENTRY AND EXIT CRITERIA

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11.1 Entry Criteria into DBS Connectivity Testing

Criterion	Evidence
RB system has successfully passed formal RB system testing.	System Test Exit Report signed off by DBS.
RB has met the security standards set out by OCJR to connect to the exchange.	OCJR document set complete – statement of conformity in the relevant Code of Connection documentation.
Steria must be allowed to enter the RB's premises to install the security certificate(s).	Steria confirm to DBS security certificate installed.

11.2 Exit Criteria from DBS Connectivity Testing

Criterion	Evidence
Registered Body and OCJR must have successfully executed and passed the test cases in the Connectivity Test Specification	Connectivity Test Summary Report produced by RB and OCJR.