An Example
Integration Platform Upgrade
Test Inception Document

Edition 01A

Released

Table of Contents

1 Introduction & Status

1.1 Introduction

This document is the inception document for the assurance activities to be performed on the following elements:

- The BizTalk changes in maintenance release
- BizTalk switching to Active-Active operation.

This is a test architecture document that provides the basis for subsequent test definition and planning.

1.2 Status of this work

This work:

- Has a number of Important Clarifications that need to be addressed before it is finalised.
- Will need to be reviewed by the wider programme and material issues addressed prior to baselining it as the starting point for full test strategy development.

2 Document Structure, Purpose and Lifetime

2.1 Document Structure

Firstly, the document contains a high level (though comprehensive) description of the “risk landscape” that arises from the BizTalk changes. This landscape is one of the principal drivers of the test approach. Socialising this landscape within this document creates the opportunity for other parties to provide feedback on and input to this risk landscape.

Secondly, the document provides an equally high-level description of the proposed test approach. This description:

- Identifies the key elements of the approach – though not necessarily all the elements that will be part of the approach.
- Defines any significant and/or non-obvious features of the described elements.

Thirdly, the document captures, via a mapping matrix, how it is envisaged that the elements of the test approach will mitigate the features of the risk landscape.

Fourthly, the document outlines the structure of the test campaign in terms of what testing is applied in which sequence / within what timeframes to assure the objectives are met. This includes identifying where test activities are first performed and where they are subsequently, possibly conditionally, repeated, possibly in a reduced form, to deal with the impact of changes that are merged in during the campaign.

Fifthly, the document lists recognised limitations of the approach that are worthy of note.

Finally, any secondary clarifications that are outstanding are listed.

2.2 Document Purpose

To create the opportunity for other parties to check that an appropriate and robust test approach that addresses the material risks will emerge from the test planning process.

To act as the starting point for the derivation and documentation of a Risk Landscape Map.

To act as the starting point for the derivation and documentation of the Test Approach, the Test Practices and the Test Programme Plan(s) that together make up the Test Strategy.

2.3 Document Lifetime

Given the purpose of this document it is a transient rather than a persistent document. Once it has served its purpose it will not, generally, be maintained and will become dormant. So, for example, if later in the programme the test strategy evolves then the Test Strategy documents will be updated but this document will not generally be updated.

In exceptional cases, for example if there is a major change to the nature of the programme, then a similar cycle of socialising changes to the risk landscape and testing strategy may be necessary. In such circumstances this document may be refreshed. However, in the same situation it may be equally valid to leave this document dormant and create a new document to serve this purpose.

3 Footprint of this Assurance Campaign

The items that have been considered to be within the scope of the assurance campaign that this inception document targets are summarised in this section.

3.1 The general footprint of Change

- Changes to BizTalk
- Introduction of the change BizTalk into service.

3.2 Assurance objectives that are in-scope

- Avoiding regression within any part of the overall solution when the changed BizTalk release is introduced into the production service.
- Assuring the implicit BizTalk progression objective of BizTalk being able to handle increased numbers of external systems and the associated increased volume of external system messaging that will arise from bringing more markets on-board without a degradation in either the quality of service from BizTalk or the dependability of BizTalk.

3.3 Assurance objectives that are out-of-scope

- Assuring that the core ERP system can handle increased numbers of diverse external systems and the associated increased volume of external system messaging that will arise from bringing more departments on-board.

4 Important Clarifications

To finalise this inception work and / or to confirm its fitness for purpose a number of key clarifications, listed below, are required. These are the clarifications that could have a significant material impact on the contents of this work.

Id	What needs clarifying	The outcome
IC01	Will the database changes and application changes be deployed to production as a single event or will the they be separated? Generally, what will the deployment sequence be?	Single event
IC02	Is the target database version SP3 or SP3 CU3?	SP3 CU3
IC03	Does BizTalk CU4 depend on an MS SQL update?	Yes
IC04	What is the database upgrade / roll-back approach? Is this an in-situ upgrade or are separate instance to be prepared and a cutover performed?	In situ
IC05	How is / will the database nodes be configured? Is there a single active node? Does this configuration remain the same?	Single active node
IC06	Is the introduction of a new load balancing model using a network load balancer a part of the release?	Yes
IC07	If a network load balancer is being introduced, then what sort and where is the configuration defined?	
IC08	Which interfaces, other than the departmental systems interface, are switching to active-active operation and which ones are remaining active-passive?	None
IC09	Is BizTalk disaster recovery in-place and, if so, are there any impacts on the disaster recovery approach?	No, it is not in place

5 Changes Considered

This section summarises the nature of the change(s) from which the assurance need arises. The information is presented (a) to allow its completeness and accuracy to be checked by others and (b) to ensure that the change content is fully addressed in the rest of the analysis.

5.1 Changes to systems within the delivered solution

This section identifies changes to the contents of the deployable systems that form the solution delivered by the FTP programme.

5.1.1 BizTalk

- Update of MS SQL Server 2012 database to Service Pack 3 (SP3) from Service Pack 1 Cumulative Update 5 (SP1CU5).
  SP3 CU3 - https://support.microsoft.com/en-us/kb/3152635
  SP3 CU2 - https://support.microsoft.com/en-us/kb/3137746
  SP3 CU1 - https://support.microsoft.com/en-us/kb/3123299
  SP3 - https://support.microsoft.com/en-gb/kb/3072779
  SP2 CU9 - https://support.microsoft.com/en-gb/kb/3098512
  SP2 CU8 - https://support.microsoft.com/en-us/kb/3082561
  SP2 CU7 - https://support.microsoft.com/en-us/kb/3072100
  SP2 CU6 - https://support.microsoft.com/en-us/kb/3052468
  SP2 CU5 - https://support.microsoft.com/en-us/kb/3037255
  SP2 CU4 - https://support.microsoft.com/en-us/kb/3007556
  SP2 CU3 - https://support.microsoft.com/en-us/kb/3002049
  SP2 CU2 - https://support.microsoft.com/en-us/kb/2983175
  SP2 CU1 - https://support.microsoft.com/en-us/kb/2976982
  SP2 - https://support.microsoft.com/en-gb/kb/2958429
  SP1 CU9 - https://support.microsoft.com/en-gb/kb/2931078
  SP1 CU8 - https://support.microsoft.com/en-gb/kb/2917531
  SP1 CU7 - https://support.microsoft.com/en-gb/kb/2894115
  SP1 CU6 - https://support.microsoft.com/en-gb/kb/2874879
- Update of Biz Talk application to 2013 Cumulative Update 4 (CU4) from Cumulative Update 3 (CU3)
  CU4 - https://support.microsoft.com/en-us/kb/3152055
- Change of configuration of departmental system message handling to use Sequential-Convoy processing.
- Replacement of current SFTP adaptor with the standard BizTalk SFTP adaptor contained in CU4.

5.2 Changes to the way system(s) operates

5.2.1 BizTalk

- Operate as Active / Active server pair rather than as Active / Passive pair

5.2.2 ERP

- ERP receives messages from and acknowledges messages to two BizTalk servers at the same time rather than from a single BizTalk server.

5.3 Changes to the technical environment hosting system(s)

None

5.4 Changes to the way system(s) are operated and monitored

5.4.1 BizTalk

- ??Change to the SFTP credentials management practices and process?? – TO BE CLARIFIED
- Update to BizTalk 360 to align with Active-Active operation.
- Changes to operational procedures used by IT operations.

5.5 Relevant changes in the associated / connected IT landscape

5.5.1 Existing Departmental Systems

None

5.5.2 Existing Other Systems

None

5.5.3 New / Additional Systems

- The number of departmental system connections through BizTalk will increase to three, at a later date, when the next ERP deployment occurs, and, subsequently, to greater numbers as departments are onboarded.

5.6 Changes to the end-user use of the system(s)

None

5.7 Changes to the nature of the workload the system(s) handle

None

5.8 Changes to the volume of the workload the system(s) handle

- The volume of departmental system messaging through BizTalk into ERP increase to three, at a later date, when the next ERP deployment occurs, and, subsequently, to greater numbers as departments are onboarded.

6 The Risk Landscape

The Risk Landscape describes what we are particularly concerned about – the things we must cover when testing.

6.1 Principal risk themes

The major features of the Risk Landscape are catalogued below. Major features are things that have a reasonable probability of "going wrong". There could be a number of different ways any one of the features could "go wrong" and a variety of "causes" but this additional depth is the remit of the Risk Landscape Map rather than this document.

The themes are split into (a) those that are clearly Regression for the business, (b) those that clearly represent failed Progression commitments by the Programme and (c) others.

RT	Regression Themes
RT101	Upgraded MS SQL database service operational dependability degrades – trigger is that it does not operate dependably on the production database virtual infrastructure it is deployed to.
RT201	BizTalk application operational dependability degrades – triggered by compatibility issues within the new combinations of BizTalk version and the database version.
RT202	BizTalk application operational dependability degrades – triggered by the update to the BizTalk versions.
RT203	BizTalk solution suffers consistent functional failures – triggered by compatibility issues within the new combinations of BizTalk customisation and changes to the platform it is running within.
RT204	BizTalk solution suffers consistent functional reliability degradation – triggered by compatibility issues within the new combinations of BizTalk customisation and changes to the platform it is running within.
RT205	BizTalk resource consumption degrades unacceptably compared with existing solution on a like-for-like message activity basis.
RT206	BizTalk operation on a single active server offers a significantly worse throughput to latency relationship due to increased resource consumption for the same workload.
RT207	BizTalk does not balance workload across the two active servers leading to an imbalance of the load placed on servers.
RT301	Departmental message delivery reliability degrades unacceptably compared with existing solution on a like-for-like message workload basis.
RT302	Departmental message latency degrades unacceptably compared with existing solution on a like-for-like message workload basis.
RT303	Resource consumption degrades unacceptably compared with existing solution on a like-for-like departmental message workload basis.
RT401	Message ordering is not preserved in the same way as it is in the existing solution particularly when active-active operation is in-place.
RT402	Inappropriate coupling is introduced between the message streams from the two existing departmental systems.
RT501	SFTP input processing suffers consistent functional failures.
RT502	SFTP input processing delivery reliability degrades unacceptably compared with existing solution.
RT503	SFTP input processing suffers content truncation or corruption.
RT504	SFTP output processing suffers consistent functional failures.
RT505	SFTP output processing delivery reliability degrades unacceptably compared with existing solution.
RT506	SFTP output processing suffers content truncation or corruption.
RT601	Receipt of messages to ERP becomes unreliable due to two active servers now delivering messages concurrently to ERP.
RT602	Receipt of messages to ERP becomes unreliable due to two active servers now delivering messages concurrently to ERP causing increased level of peak concurrency.
RT701	BizTalk fails or does not deliver acceptable service when one server is down in an active-active mode.

PT	Progression Themes
PT01	The message throughput rates that will be applied when the next department is on-board, cannot be supported or can cause an unacceptable degradation in latency when operating on a two-server active-active BizTalk configuration.
OT	**Other Themes**
OT01	Production deployment of the database update fails, and it is necessary to roll-back the deployment and revert to the existing database version.

6.2 Specific threats

Things that standout as potential sources of problems are catalogued in this section. As mentioned above "generic threats" such as "we are changing the software" or "we are adding new functionality" are deliberately excluded from this catalogue.

The threats are split into (a) those that would manifest themselves when the technical deployment occurs and (b) those that would manifest themselves when the next department is migrated onto the solution.

ST-T	Specific Threats associated with Technical Deployment
ST-T-01	Database version change.
ST-T-02	Application version change.
ST-T-03	Introduction of sequential-convoy message handling pattern.
ST-T-04	Replacement of SFTP adapter.
ST-T-05	Active / active operation.
ST-T-06	Messages are held in BizTalk due to transmission to ERP halting when the sequential convoy is due to recycle.
ST-T-07	Messages are held in BizTalk due to transmission to ERP halting when BizTalk is restarted.
ST-G	**Specific Threats associated with Departmental Go-live**
ST-G-01	Addition of a third departmental system.
ST-G-02	Increased volumes of departmental message activity.

6.3 Specific failure types

Types of failures that need special attention in order to ensure they are searched for in an effective way and/or spotted should they be occurring are catalogue in this section. Often these relate to "orthogonal concerns".

SF	Specific Failure Types
SF-01	Out of order message delivery.
SF-02a	Truncation or corruption of message contents – departmental messages
SF-02b	Truncation or corruption of message contents – SFTP transfers

7 Key Elements of the Test Approach

This section provides an overview of the testing that will be undertaken by the Programme Test Function. The structure of the section is as follows:

- A statement of the relevance of each of the "standard categories" of testing to this campaign. Categories identifies as being relevant (those that aren't Not Applicable or Excluded) will be explicitly deployed across test activities,

- Identification of the test activities that will be performed within the campaign.

7.1 Categories of testing to be applied

A variety of standard categories of testing are applicable, under different circumstances, when assuring changes to the solution. The nature of each of these categories of testing is defined in the Test Practices element of the Test Operating Model. The definitions fall into four "category groups", these being:

- **"Technology" Oriented testing** – testing that focusses on the dependable operation of the IT system, whether it works as intended (written and implicit intent) and whether the "experience" of working with the system is acceptable. These categories then fall within four sub-groups:
    - **Behaviour focussed categories** – is the system behaviour observed by actors interacting with the system and represent in the state it holds and the business actions and outputs it generates correct?
    - **Quality of Service focussed categories** – is the system dependable / reliable and performant?
    - **Quality of Experience focussed categories** – is the user experience good and consistent where ever and however they are accessing the system? Are regulatory requirements met?
    - **Security focussed categories** – are business rule constrains on users and their access and visibility met? Are restrictions on IT operations staff appropriate? Is the system safe from malicious technical attack?

- **"Process" Oriented testing** – testing that focusses on whether the IT system appropriately supports the defined processes, whether those processes are coherent and achievable given the way they are supported and on the ability to execute and the experience of executing the accounting cycle on the IT solution.

- "**Business Outcome" Oriented testing** – testing that focusses on whether the solution when operated as intended delivers correct business and accounting outcomes.

- **"User Capability" Oriented testing** – testing that focusses on whether end users who have received the mandated orientation and training can work effectively with the solution.

The relevance of applying category explicitly within this campaign is identified in Table 1 on page 13.

Table 1 Test Category Applicability

Grp	Category	Remit	Relevance
T-B	General Behaviour Testing	Does the IT solution behave as intended?	Low
T-B	General Robustness Testing	Is the implementation robust?	Low
T-B	Data Exchange Testing	Can the IT solution exchange data with other systems correctly?	High
T-B	Information Interchange Testing	Is the meaning of information represented by data that is exchanged consistent across systems?	Medium
T-B	Data Threat Testing	Can the IT solution handle the variety of data it will encounter?	Excluded
T-B	Real-World Data Testing	Does the IT solution work the same on real-world data created on earlier versions or migrated in?	NotApp
T-QoS	Operational Dependability Testing	Does it work without “randomly” or “recurrently” failing to operate?	High
T-QoS	Functional Reliability Testing	Do the functions offered to support the business work reliably?	Medium
T-QoS	Performance Testing	Is performance adequate and consistent?	Medium
T-QoE	User Experience Evaluation	Do individuals who interact with the system get a poor experience?	NotApp
T-QoE	Client Environment Testing	Does it work consistently when for individuals in all client environments?	NotApp
T-QoE	Regulatory Usability Compliance	Does it comply with regulatory usability / accessibility rules?	NotApp
T-Sec	Business Domain Security	Are authority models and information protection models implemented correctly?	NotApp
T-Sec	IT Operations Domain Security	Are system and information protection principles and requirements embodied in the system?	NotApp
T-Sec	Insider Attack Resilience	Is the solution resilient to intentional attack from inside the network perimeter adequate?	NotApp
P	Individual Document / Voucher Process Centric Testing	Are the process defined around individual documents, sound and are they correctly automated?	NotApp
P	General Process Sequence Testing	When process sequences that the business will execute are executed to they deliver the necessary outcomes?	NotApp
P	Solution Operational Cycle Testing	When the solution goes through its expected operational lifecycle does it deliver the necessary outcomes?	NotApp
B	Financial Interaction and Accounting Testing	Can feasible sequences of financial interactions be supported and accounted for and is the level of manual intervention and adjustment required acceptable?	Low
B	Business Lifecycle Testing	Are typical trading lifecycles supported and accounted for and is the level of manual intervention and adjustment required acceptable?	Excluded
U	Clerical Activity	Can users who have had standard training effectively and correctly execute their clerical and administrative roles.	NotApp
U	Financial Processes	Can teams / users who have had standard training effectively and correctly execute identified financial processes.	NotApp

7.2 “Repeating” “Vanilla” Test Activities

This section identifies the “Repeating” “Vanilla” test activities.

“Repeating” meaning these activities are repeated, as applicable, a number of times across the various payloads of the work the campaign is addressing. Examples could be (a) across the work packages in the build or (b) across the external systems that are integrated.
“Vanilla” meaning they are the types of testing that are generally applicable and up-front, during test planning, the need for these activities is identified but limited detail is specified as the normal process of execution is trusted to generate the right result.

7.3 “Individual” “Vanilla” Test Activities

This section outlines the “Individual” “Vanilla” test activities.

> “Individual” meaning these activities occur once or a small number of enumerable times that are not liable to change.
> “Vanilla” meaning they are the types of testing that are generally applicable and up-front, during test planning, the need for these activities is identified but limited detail is specified as the normal process of execution is trusted to generate the right result.

7.3.1 End to End Departmental System Focussed

- **[IV101] ABACUS to ERP Data Exchange** – test that data sent from ABACUS to ERP is transferred and arrives correctly formed within the ERP staging tables.
- **[IV102] Blackboard to ERP Data Exchange** – test that data sent from ABACUS to ERP is transferred and arrives correctly formed within the ERP staging tables.
- **[IV103] ABACUS to ERP Information Exchange** – tests that confirm that the creation / amendment of projects in ABACUS is correctly reflected in the project status in ERP.

7.3.2 End to End Data Exchange Focussed

- **[IV201] BizTalk E2E Flow Basic Data Exchange Test** – test each E2E flow through BizTalk in a connected environment using real ERP and other systems as the BizTalk clients and end points.

7.3.3 BizTalk Operation Under Load Focussed

- **[IV301] BizTalk Present Day Load Test** – test the impact on BizTalk and on BizTalk’s resource consumption of present day operational loads. Include single server operation.
- **[IV302] BizTalk Next Department End State Load Test** – test the impact on BizTalk and on BizTalk’s resource consumption of Next Department End State operational loads.

7.4 “Individual” “Custom” Test Activities

This section outlines significant test activities with a specific purpose that will form part of the test campaign and that are very much dependent upon the contents of the work covered by the campaign.

> “Individual” meaning these activities occur once or a small number of enumerable times that are not liable to change.
> “Custom” meaning they need for and the nature of the testing is very much derived from the nature of the changes being addressed and these activities may only occasionally feature in a test campaign looking forwards.

7.4.1 Database Focussed

- **[IC101] Database soak and endurance tests** – a test that the new version of the database, when deployed on the target infrastructure, can operate under load and stress for extended period without failure or degradation.
- **[IC102] Database upgrade process tests** – a test that the selected database upgrade or deployment and cutover process can be relied on both in terms of execution time and the correctness of the outcome.

7.4.2 BizTalk Media System Message Handling Focussed

- **[IC201] Message delivery sequence tests** – test that the stream of messages from each external system is delivered to the recipient system in the order the messages are received at BizTalk from the external system. Using simulated external systems and a simulated ERP system and high-volume message flows. Includes operation where receiver consumption rate is lower than message arrival rate causing backlog inside BizTalk. Test in active-active and single node active mode.
- **[IC202] Message stream independence tests** – tests to prove the independence of the message streams from different external systems. Delays, pauses in the receipt of stream A do not interfere with stream B.
- **[IC203] Two server delivery to ERP tests** – tests to prove that no issues are introduced when messages are being sent concurrently to ERP from two separate BizTalk server instances. Include peak concurrency tests.
- **[IC204] Processing threat tests** – tests of identified “risky” processing scenarios – currently (a) convoy expiry when messages are queued and (b) restart when messages are queued.
- **[IC205] Disrupted processing tests** – tests where normal processing is disrupted by events such as the receiver (ERP) going on and offline and individual BizTalk servers starting and stopping.

7.4.3 SFTP Focussed

- **[IC301] SFTP Input Soak test** – testing of repeated SFTP transfers of varying data payloads with validation of payload arrival executed in an end to end environment with the real systems (Bellin/Recall/MC) acting as the SFTP server.
- **[IC302] SFTP Output Soak test**– testing of repeated SFTP transfers of varying data payloads with validation of payload arrival executed in an end to end environment with the real systems (Bellin/Recall) acting as the SFTP server.
- **[IC303] SFTP Input Robustness tests** – testing of input operation when the remote SFTP server behaviour is not ideal using a stubbed remote SFTP server.
- **[IC304] SFTP Output Robustness tests** – testing of output operation when the remote SFTP server behaviour is not ideal using a stubbed remote SFTP server.

7.4.4 BizTalk Focussed

- **[IC401] BizTalk soak and endurance tests** - a test that the new of BizTalk using the new version of the database, when deployed on the target infrastructure, can operate under load and stress for extended period without failure or degradation.
- **[IC402] Failure tests** – test the impact of node transitions (start/stop/fail/restore) for BizTalk and BizTalk DB nodes.

8 Mappings

	IV101	IV102	IV103	IV201	IV301	IV302	IC101	IC102	IC201	IC202	IC203	IC204	IC205	IC301	IC302	IC303	IC304	IC401	IC402
RT101							X											X	
RT201																		X	
RT202																		X	X
RT203				X														X	
RT204																		X	
RT205					X														
RT206					X														
RT207					X	X													
RT301	X	X																	
RT302					X														
RT303					X														
RT401	X	X	X						X			X							
RT402										X									
RT501														X					
RT502														X		X			
RT503														X					
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RT505															X		X		
RT506															X				
RT601											X								
RT602											X								
RT701													X						
PT01						X													
OT01								X											
ST-T-01							X											X	
ST-T-02	X	X		X										X				X	
ST-T-03	X	X							X	X		X							
ST-T-04														X	X	X	X		
ST-T-05	X	X	X	X					X		X								X
ST-T-06												X							
ST-T-07												X							
ST-G-01																			
ST-G-02															X				
SF-01									X										
SF-02a																			
SF-02b														X	X	X	X		
GBT	X	X		X						X				X	X	X	X		
GRT											X	X	X	X	X	X	X		
DET	X	X		X															
IET			X																
DTT																			
ODT							X											X	X
FRT									X									X	
PT					X	X													
FIAT			X																
BLT			X																

9 Limitations

This section outlines limitations of the approach contained within this document.

9.1 Significant Limitations

None

9.2 Notable Limitations

- [01] The testing will not test the addition of any other external system channels into BizTalk. Therefore, it cannot be confirmed that the system will behave in the same way as more channels are introduced.

- [02] There is no explicit attempt to trigger and detect truncation or corruption of external system messages.

9.3 Other Limitations

None identified.

10 General Clarifications Required

1. Is BizTalk used to read documents loaded into SharePoint folders? Relates to CU4 – 3076462.
2. The acknowledgement model and how many messages can be queued inside BizTalk.