



SBR Conformance & Assurance Testing Proposed Design

DRAFT

V0.5

DRAFT

Version	Date	Author	Summary of Changes
0.1	18/12/2017	Nicola Sellick	Initial draft
0.2	18/12/2017	Nicola Sellick	Updated after internal review
0.3	15/01/2018	Nicola Sellick	Inclusion of options for test case detail specification. Highlighted minor changes in other sections in yellow as well as outstanding questions.
0.4	25/01/2018	Nicola Sellick	Updated after external review
0.5	05/04/2018	Nicola Sellick	Updated preferred method for test case identification.

Contents

1	Background	3
2	Purpose	3
3	Assumptions.....	3
4	References	3
5	High Level Flow	4
6	Detailed Design	5
6.1	ATO Defined test case data & descriptions	5
6.2	DSP consumption of ATO defined test cases	6
6.3	Capturing test case/step details	7
6.4	Comparison Functions	7
6.5	General Questions	8
7	Requirements Matrix	9
8	Appendix	11
8.1.1	Option 1A Use an existing element in the message payload	11
8.1.2	Option 1B Add a new element in the message payload	12
8.1.3	Option 2B Use an existing property in the ebMS3 header	12
8.1.4	Option 3 Capture test case/step details by an external means	12
8.1.4.1	Capture via ATO provided UI (method 1) or REST service (method 2)	13
8.1.4.2	Capture via parameters with ATO endpoint URL	14

1 Background

A series of consultations with external software developers in a variety of forums have identified a set of requirements to address concerns in the current ATO Conformance Testing process.

2 Purpose

The following document presents an initial set of processes & system design to meet these requirements. Whilst this proposal is generic in design & should be suitable for all ATO SBR2 services, it was determined that the STP Payroll Event service would be the first such service to trial these enhancements.

This is an initial design concept & is still subject to further consultation with both ATO & the software developer industry. This design is also subject to changes in the Operational Framework that may occur.

This design supports the 'ATO Assessed Results' at a transaction level as described in the Draft Assurance Framework Proposal endorsed by the STP Micro Group.

3 Assumptions

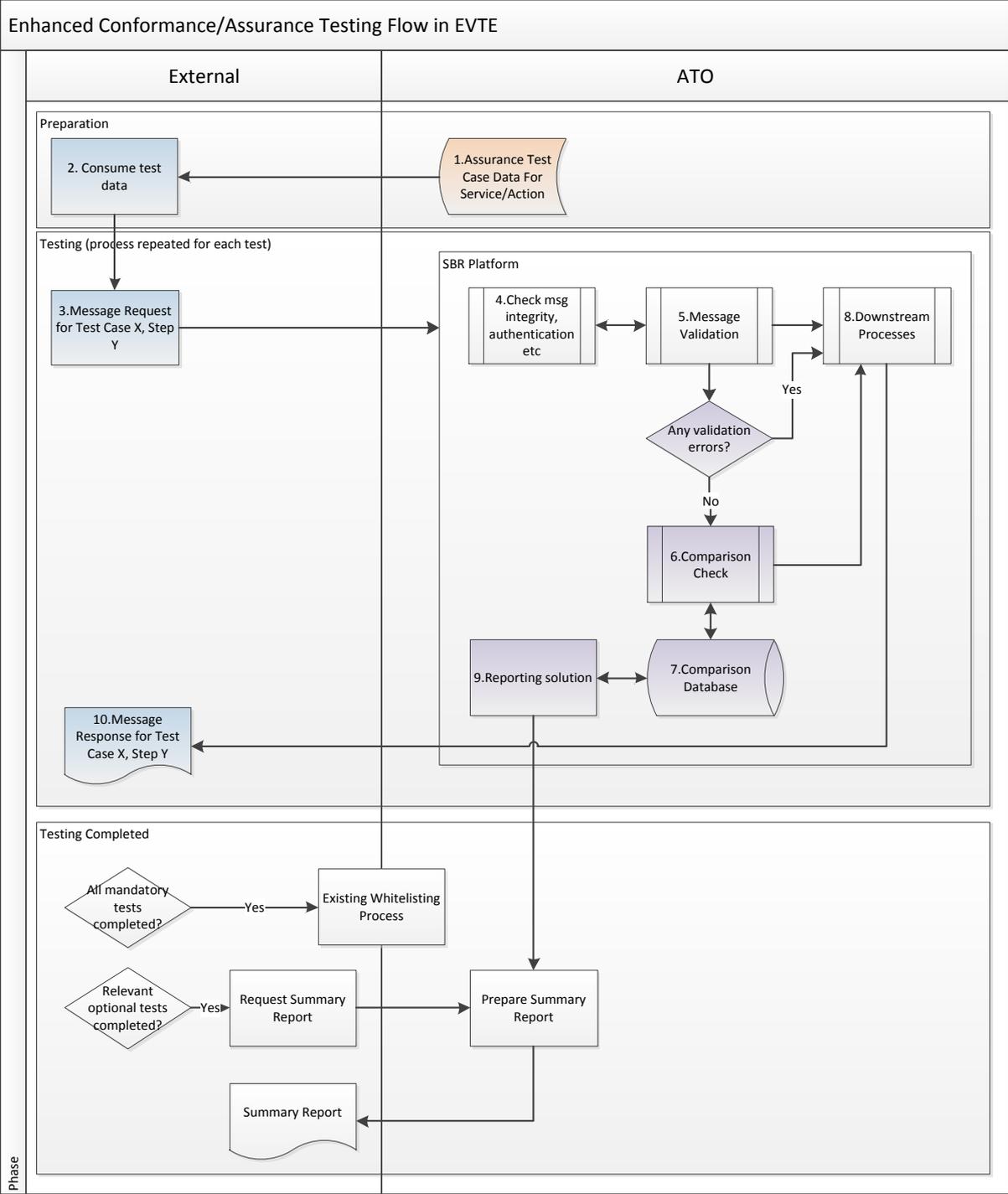
- 1 Current product id whitelisting processes will supply a unique product id for identifying who is seeking conformance/assurance.
- 2 Whitelisting is achieved by running mandatory ATO defined test cases & self-certifying that these test cases have been run successfully. ATO in the past have also required additional production verification tests to be completed in order to whitelist. Optional business assurance tests are being defined to assist with running these types of tests in EVTE. Passing an ATO assurance test does not mean that ATO is assuring that software product in general.

4 References

Draft Assurance Framework Proposal v2.0

SBR Conformance and Assurance Testing Requirements v0.2

High Level Flow



Testing an ATO provided test case (where ATO defines the scenario & data)

1. ATO prepares test case data & scenario descriptions
2. DSP consumes test data
3. For any message request supporting an ATO test case, the DSP must specify the test case id & step
4. Existing processes to check message integrity, authentication etc take place

5. The message content is validated as per published validation rules (schema validation only)
6. If there are no validation errors, the message content is compared against the expected input that is defined for that test case #/step #.
7. A comparison database holds the comparison tests to be run for each test case #/step #. All test case #/step # outcomes are stored.
8. Downstream processes continue (e.g. transformation, message aggregation)
9. The comparison database can feed into internal ATO reporting functionality to check test case results etc.
10. The message response is provided, & includes:
 - The test case result
 - Any fields in error, including the provided & expected values
11. When all mandatory tests have been completed, the existing whitelisting process can take place.
12. When all the relevant optional test have been completed, a new process will be developed, that includes producing a summary report of the assurance tests that were run.

Alternative path

Steps 1 – 5 as above

Step 7 If any validation errors are created, then no comparison check is performed.

Downstream process will continue.

Step 10 Validation errors are included in the message response

Testing a DSP defined test case (non ATO specified test case)

This type of test case will follow a similar pattern to the two above. However, no comparison functions will be performed when no known test case #/step# is provided.

Detailed Design

6.1 ATO Defined test case data & descriptions

1. ATO will confirm that scenarios & data are business valid
2. ATO will ensure all SBR artefacts are consistent in content across the different types of documents
3. One test case can have many steps.
4. Test cases can be for technical conformance or business assurance.
5. Business assurance test cases will be divided into functional categories.
6. Still to be confirmed how this process will work in practice, but it is recognised that industry consultation may be required in developing test cases for particular services.
7. Test data will be provided in consumable/human readable format. E.g. csv file.

8. ATO will provide core data relevant for all their specified test cases (but not the actual message payloads for these tests), for DSPs to prepare the related message requests. Sample payloads will also be provided.
9. For the initial phase, ATO's preference is to have a test case at the parent/base form level. Several child records can be included. Note that an assurance test can require several 'runs' (steps). Will need to consider assurance tests at the transmission level (multi parents/base forms) for end state. Child records do not need to be specifically identified by the external tester.
10. The outcome (pass/fail) & other relevant details for every invocation of a service running an ATO specified test case will be recorded for ATO review purposes. This will include those where the test case was testing schema validation only.
11. The existing whitelisting process will remain as is.
12. Once all assurance tests have been run a DSP can request for a summary of all the tests they have run & their outcomes, grouped by functional categories (more discussion required).

6.2 DSP consumption of ATO defined test cases

1. ATO understands that current EVTE testing does not always initiate from a DSP's software product. Test's may also be run from a DSP test harness.
2. The proposed enhancements depend on the ability to identify the test case/step being run. Consultation with DSPs part of the focus group provided the recommended solution for this identification. See the Appendix for other options that were discussed but not selected.

6.3 Capturing test case/step details

After ongoing consultation between the Assurance Focus group members, the DARG members & ATO, the preferred means of capturing the test case/step details will be via the creation of new custom properties under the Message Properties element in the ebMS3 header. Changes are required in the SBR platform framework to process the new properties. These properties will be ignored if specified in a message in the production environment.

Advantages

1. Very clear delineation and identification of test case/step details
2. Can identify an invalid test case/step in the message request and provide appropriate error message
3. Has no impact on the message payload in production

Disadvantages

1. Changes required by all external parties (DSP & SSP) who wish to perform assurance tests in EVTE to specify the test case/step details.

This option (previously referred to as Option 2A) was determined to be the cleanest, most appropriate place to capture the required details.

Refer to the Appendix to see details on other options that were explored.

6.4 Comparison Functions

1. Once all validation tests have been passed, a new comparison service will be run.
2. A check will be made to the 'Test Harness' database to see if the incoming message's product id/service name/action has been specified there. If message id was also specified, then the incoming message's message id must also match for the test harness record details to be used.
3. If the incoming message relates to a known test case id & step, then all comparison tests relevant for that test case id/step combination will be run.
4. All fields relevant for the test case/step will be defined. A comparison type for each of these fields will also be defined. All comparison fields/type will be made known to DSPs as part of the Test case data & descriptions package.
5. Three types of comparison checks have been identified so far:
 - a. Ignore field
 - b. Compare for exact match
 - c. Field must not be provided
6. For each field that fails its comparison check, an error message will be included in the message response. E.g. if 10 fields fail comparison checks, then 10 comparison errors will be returned. Fields that pass their comparison check will not be included in the message response.
7. The order of fields in the message is not important for the comparison checks.
8. So far three types of comparison error message have been identified (not exact text):

Comparison Check	Message Description (not exact text)
Ignore field	NA (providing this field does not equate to comparison failure)
Compare for exact match	(1) Exact match required, provided value doesn't meet expected value (2) Exact match required, but field not provided
Field must not be provided	(3) Field not permitted but was provided

9. A generic message text will be used for each of these message types. However, each will be parameterised to identify the field, provided value & expected value. Fields will be identified by their X-path. Assume that different types of actors need this information – technical & non-technical staff, & system.
10. If no comparison errors are created, then the test case/step is deemed to have passed. Otherwise, the test case/step is deemed to have failed. The comparison test result will also be included in an informational message as part of the response. All comparison test results will be recorded for ATO use.
11. The message response for ATO specified tests will include the test case/step, overall comparison result plus individual error messages for each field that failed.

6.5 General Questions

- (1) *Is there value in providing a single set of test cases that are common to all services in a single set of documentation?* To be removed – not required to be known at this time
- (2) *It is unlikely that all features can be delivered at once if there is a short delivery timeframe. How would DSP's like to see each delivered, i.e. what could be in phase 1, phase 2?* Focus group have indicated that they want to see the data quality/ documentation improvements provided first. It was recognised that more time will be required to deliver the comparison function & therefore can be delivered in a later phase. **Update** – the assurance technical framework (includes the comparison function) will be included in Phase 2, with any external reporting capability (e.g. assurance report) included in a later phase. This capability is still being discussed within the ATO & is distinct to any internal reporting capability.
- (3) *Should method 1 & 2 for external capture of the test case details be provided in an authenticated environment?* Yes
- (4) *Do we need to continue defining test cases as conformance & assurance? Does conformance relate to technical testing or testing what ATO deem to be mandatory? Does assurance relate to business testing or what externals deem to be optional? There are business tests specified in current conformance suites that ATO deem mandatory. DSPs see assurance testing as optional & tests that confirm the value of each element in a payload that is relevant to the test. If ATO were to make any 'business' related test mandatory, then DSPs would then see those tests being part of Conformance testing. Recommend that in future, 'conformance' covers all tests required to whitelist a product for a service, whilst assurance covers tests that are optional. Both sets of tests can use the common enhanced framework described above. This issue requires further discussion.*
- (5) *Should ATO provide the test payloads in future?* No, only samples will be provided to illustrate the structure of the message.

7 Requirements Matrix

Requirement	Proposed Solution
<p>1 ATO supplied data for testing to be made available in alternative formats for DSP consumption, ideally in human readable form . Suggested formats were csv, Excel spreadsheets & XML, with majority requesting csv. Each data item should be identified at least by the MST label or alias. It is recognised that additional data that is not specifically in the payload may need to be included to help the DSPs set up their data. Existing conformance payloads to continue to be provided as well.</p>	Section 6.1: 6-9
<p>2 Include mandatory conformance scenarios that provide a minimum level (as defined by ATO business) of quality assurance that must be passed before being allowed to consume the related service/interactions in production. These scenarios would have different kinds of test cases created to cater for the different lodgers (e.g. client, intermediary). DSP's would then run the appropriate test for the lodger(s) they support.</p>	Section 6.1: 1-4
<p>3 Include optional assurance tests, grouped by functional capability. The functional capability to be determined in consultation with DSPs</p>	Section 6.1: 4-5
<p>4 Ensure that business assurance has confirmed that UAT scenarios are business valid and correct</p>	Section 6.1: 1
<p>5 Ensure all ATO SBR artefacts are consistent in content across the different types of documents (Urgent)</p>	Section 6.1: 2
<p>6 Ensure all test data is business valid. Certain services/interactions will also require additional consultation with community specialists. Such services will be identified during the normal co-design process with DSPs</p>	Section 6.1: 1, 6
<p>7 Identify and document the circumstances and requirements for PVT. There should be a well-defined and agreed approach for what PVT is required and the scope of the PVT and which scenario and DSP participates in PVT. (High for new services, low for existing services.) This, together with the other requirements would remove</p>	Full solution. Still need to document criteria for PVT.

	<p>the reliance of using PVT to confirm outcomes that can be achieved in EVTE. Ideally, the requirement for PVT should be identified as early as possible & indicated for the relevant service(s) in the Service Registry.</p>	
8	<p>Both conformance & assurance tests to be able to confirm mapping of all relevant data elements by providing appropriate message responses</p>	<p>Section 6.2 Section 6.3: 1-10</p>
9	<p>Create a mechanism or process for DSPs/SWD to confirm if the actual values in their submissions match ATO expected values. They can then self-verify/certify that inbound data has been mapped correctly. Ensure test data supplied (with the exception of keystore related details) has been validated in ATO UAT testing regimes. Consider creating 'Cross Check Cases' similar to those used in ELS. Ideally DSPs' want the ATO to perform the comparison; getting confirmation when the payload matched expectations & the expected outcome when it did not</p>	<p>Section 6.2 Section 6.3 Section 6.4</p>

8 Appendix

Other options were explored for identifying test case/step details when running ATO defined test cases:

1. Use an element within the message payload
 - a. Use an existing element (possibly different element in each service)
 - b. Create a new element and include in every service using the enhanced conformance process
2. Use an element in the ebMS3 header
 - a. New ebMS3 property (selected method – see section 6.3)
 - b. Repurpose the action field
3. Capture the details by an external means
 - a. Via a SPA based UI & REST service
 - b. Via a REST service
 - c. Via parameters with ATO endpoint URL

8.1.1 Option 1A Use an existing element in the message payload

This requires identifying an element in each service that can be used to identify the Test case/step. The validation rules on the element must not overly restrict the value entered in the element. It is likely that a different element will be used in different services

Area	Service	Element
PLS	All ITR Lodgements	Reporting Party Declarer Position held of person making the declaration (TREF 1601)
STP	Payroll Event (Parent)	Payer Contact Name (TREF106)
STP	Payroll Event (Child)	Payee Other Name (TREF 42)
SUPER	SPRMBRACCTX	Other Given Name (TREF 42)
SUP	SPRMBRINFO	Individual Other Given Name (TREF 42)

Advantages

1. No changes for ATO specific to this option
2. No need for DSP to understand ebMS3

Disadvantages

1. Possible confusion with DSPs (& ATO testers) over different element to use in different services
2. Potential for data in an element that seems out of place (e.g. Test4-1 in another name field) may not make sense
3. Cannot identify that an invalid test case /step has been requested. ATO would just determine that it was not an assurance case and proceed as normal in EVTE. However, the DSP would realise the error as they would not receive an test case outcome (pass/fail).
4. There may be no suitable element in the message payload to use.

DSPs preferred not to use this option as the disadvantages to them were too great.

8.1.2 Option 1B Add a new element in the message payload

This requires creating the same new element in every MST. As with option 1A, the validation rules on the element must not overly restrict the value entered in the element. *Will need to decide on how the element is handled in PROD – ignore or give error message when the element is set in prod?*

Advantages

1. Very clear delineation and identification of test case/step details
2. Can identify an invalid test case/step in the message request and provide appropriate error message
3. No need for DSP to understand ebMS3

Disadvantages

1. Need to update (version up) service and publish new artefacts as the enhanced process is implemented but no other changes were required to the service
2. Approval process for new element required
3. Approval required to include 'test' element in Prod messages
4. Need approval from service/form owner to add the new element
5. Every DSP would need to modify their system to allow the entry of this value for test environments only.

DSPs preferred not to use this option as the disadvantages to them were too great.

8.1.3 Option 2B Use an existing property in the ebMS3 header

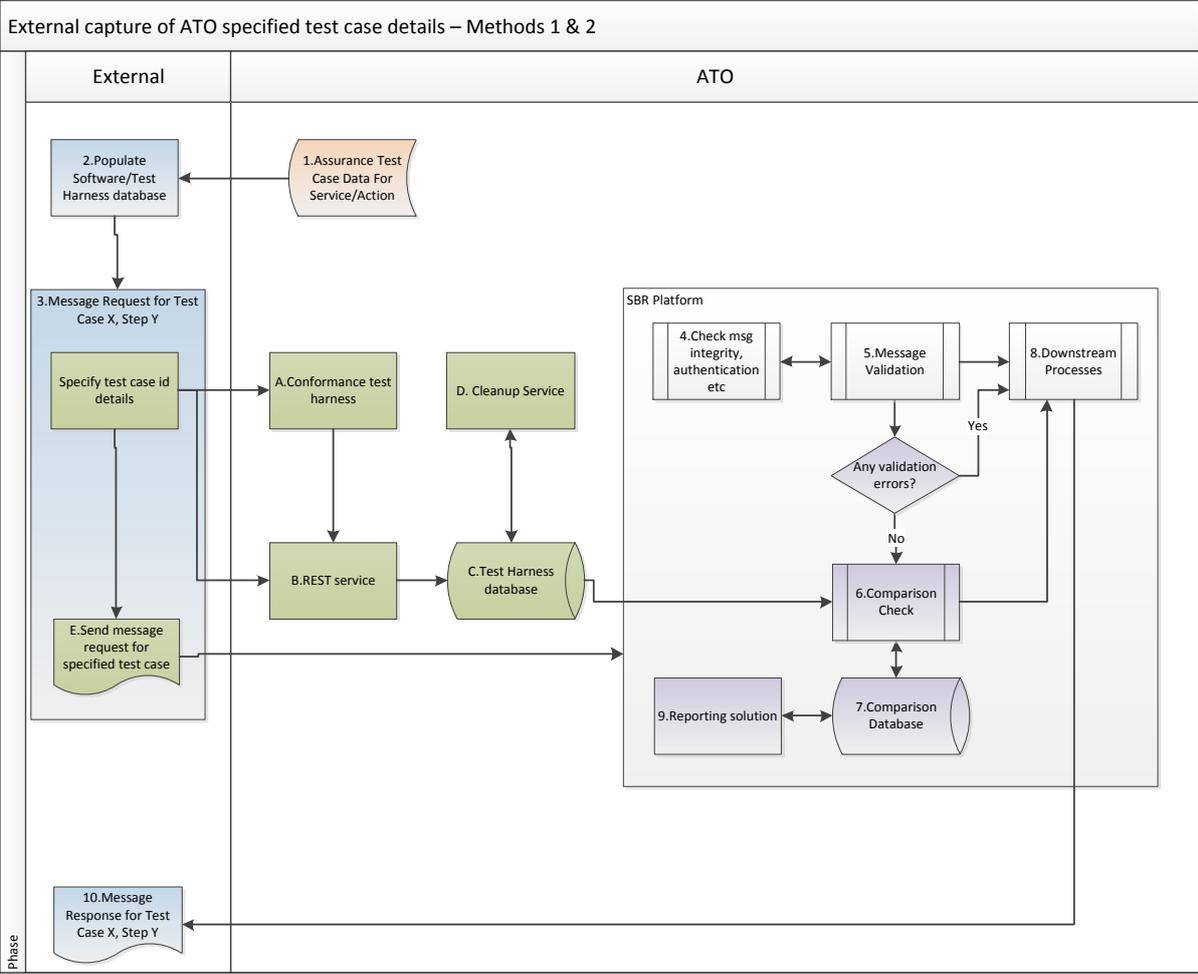
This requires using an existing ebMS3 items such as service action or version number to identify the test case. After discussions this option has been discounted due to the high level of effort to make the change, the complexity of defining multiple service actions and changing them for each different test.

DSPs only wanted to use this method if it was a last resort as they required coding changes at their end to handle the message content differently in EVTE compared to production.

8.1.4 Option 3 Capture test case/step details by an external means

Three additional methods were presented on how the test case/step details could be captured by an external (outside of the message request) means. These methods required the specification of the same items which are then stored in a location accessible to the SBR platform.

8.1.4.1 Capture via ATO provided UI (method 1) or REST service (method 2)



External tester specifies the test case/step details via an ATO provided UI (method 1) or REST service (method 2). After successful capture of these details, the message request for the same service name/action/product id with the relevant payload for the test case/step details is run. The service/action can be run with the same test case/step details until the details expire or the harness is requested to be turned off for the same service/action.

DSPs wanted user access to the UI & REST service to be authenticated.

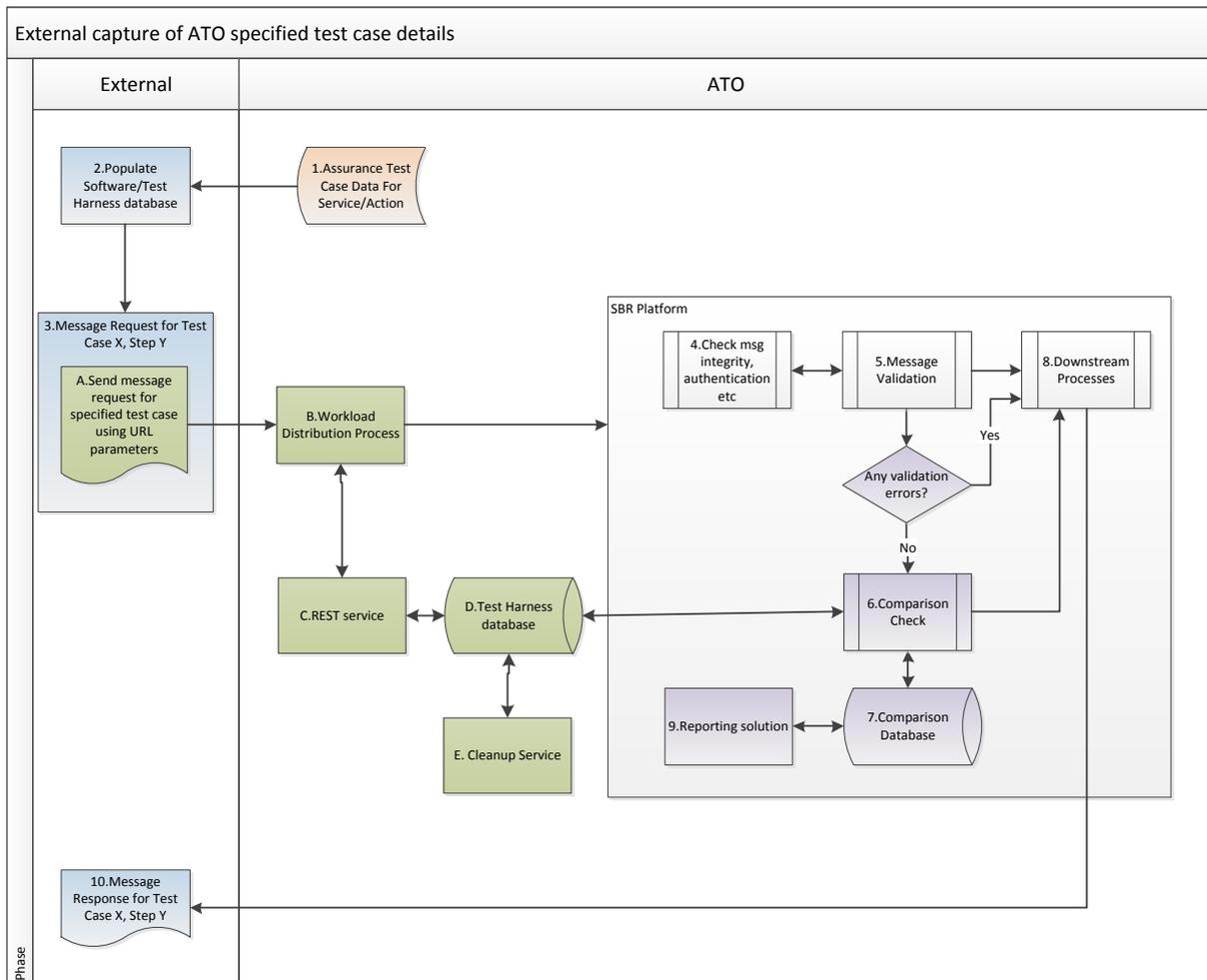
Advantages

- 1. Does not involve any changes to the incoming message structure
- 2. Very clear delineation and identification of test case/step details
- 3. Can identify an invalid test case/step in the message request and provide appropriate error message

Disadvantages

- 1. Two actions are required by the external tester to test an ATO specified test case: one to set the test case/step details for the service name/action/product id & the second to send the actual SBR message request.
- 2. DSP will need to be able to know what message id is being used in a message request in parallel testing is required.

8.1.4.2 Capture via parameters with ATO endpoint URL



A new workload distribution process is being investigated at ATO. As part of specifying the ATO URL endpoint for the message request, additional parameters can be provided to cater for the test case/step details. This process will also retrieve the message id within the message request & send it together with the other necessary details to a REST service that will store these details. It will be possible at some stage to also make this REST service directly available for those wishing to consume it that way (see Method 2 in 8.1.5.1). Once the REST service is successfully run, the message request is sent on to the SBR platform for processing.

Advantages

1. Does not involve any changes to the incoming message structure
2. Very clear delineation and identification of test case/step details
3. Can identify an invalid test case/step in the parameters and provide appropriate error message
4. Does not require tester to know what message id is being used.
5. Only requires one action (sending the message request) to test an ATO specified test case.
6. No need to turn the test harness off for a particular test case/step.

Disadvantages

1. Adds complexity to ATO workload distribution process & any consequential dependencies.
2. Requires sending service provider to provide a mechanism for the DSP to specify the test case/step details.

The following items must be captured & then stored in a location accessible to the SBR platform:

1. Service name/action (mandatory)
2. Software product id (mandatory)
3. Test case/step (mandatory when running ATO specified tests)
4. Message id (optional)

The first two items are already required as part of the proposed workload distribution process. NB This solution is dependent on the workload distribution process being delivered.

Each instance of test case details will be identified by service name/action/product id/message id.

A cleanup service would run periodically to clean up any orphan test case specifications (possibly due to authentication or authorisation errors). Specifying a message id will allow parallel testing for multiple test cases for the same service name/action & product id.

DSPs preferred the third method (via parameters) over the first two methods because that method:

1. Was to be an extension of a process they were going to have to do eventually.
2. Had less disadvantages for them

However, this method was ultimately not selected as it was agreed that using a new property in the eBMS3 was more appropriate.