LRS Testing Instructions Guide

March 2022

Audience: MI suppliers and IT developers

Contents

1 Introduction

1.1 Purpose

This guide explains all you need to know about planning for a test period and what is expected of you.

The document describes the different ways of testing. There are two types of testing:

- Ad-hoc – integration testing to check the solution works end to end.
- Compatibility – final stage before sign-off, you are required to perform specific tests and provide evidence of the results.

1.2 Types of testing

There are two levels of testing you can perform:

1. Ad-hoc – integration testing to check the solution works end to end. You can perform ad hoc testing as long as you need to get the solution compatibility with LRS. There's no maximum time before you have to move onto Compatibility testing.
2. Compatibility – final stage before sign-off, you are required to perform specific tests and provide evidence of the results.

1.3 Scope

These instructions are not intended to describe the function of the web services or how you should test your own applications. This document only covers guidance on the procedures and processes for testing web services with the LRS Organisation Portal.

1.4 Booking a test slot

Complete a Testing Application Form, tick the appropriate boxes to make sure you are given the correct access in test, confirming whether you wish to do 'Ad-hoc' or 'Compatibility'.

Select the type of testing as appropriate:

LRB	Creating and updating ULNs (including batch)
LRB	Personal Learner Record
Awarding Organisation	Achievement management (creating, updating, withdrawing and reinstating achievements)
Awarding Organisation or LRB	Verifying ULNs

The LRS will send you confirmation once your slot is booked with joining instructions. You will need to:

- Install the compatibility digital certificate
- Configure your system with the same Test Organisation Reference and password you provided in your Testing Application Form. Information: The Test Organisation Reference is unique to your organisation
- For awarding organisations, ensure that you have the correct Recognition Number (RN)
- Access the WSDLs and schemas for the test environment (provided with the Developer Pack that was mailed to your organisation when your Web Services Interface Application was approved)

You can book a maximum of **three months** at a time. We will allocate your preferred test dates but cannot guarantee this (block booking of longer than 3 months is not allowed). You need to re-apply if you wish to extend your term.

Notes:

- **Do not** try to use web services in the test environment beforehand as it will not be activated until the start of your assigned test period.
- The learner information you create is shared in the same way that this information is shared in the live service. It is therefore possible that your test data may return an unexpected result if the learner test data is similar to another organisation's test data.
- In order to reduce the risk of any LRS ULN Register Records you create conflicting with others, we recommend that you avoid using common names in testing (e.g. Smith) and use given names containing your test organisation reference number (in word form) e.g. 'one Wainwright'.
- The test environment replicates the live LRS environment except that it runs the batch processing on a more frequent basis than the live environment in order to provide batch test results to you quicker.
- If you need to change the test period you have been allocated then please complete the Testing Application Form for your new dates.

1.5   Test environment

The Test Environment offers a secure, production-like environment for performing integration testing. It also has baseline test data for running test scripts.

Note: Compatibility is not scaled to the same size as production and organisations won't be able to carry out performance testing.

Please be aware multiple developers are likely to be running their own tests and this may affect your results.

> **Key Point: Please note that the Compatibility Environment has no failover service. This service is itself provided on the failover environment for the Production Environment.**

1.6   Test environment – refresh

The environment is refreshed weekly, (cop Friday) back to a baseline. Subsequently, all information uploaded, changed or added, will be removed, i.e. creating new ULN's or changing the test data provided by LRS or creating new user accounts.

1.7   Availability times

The environment is available from the hours of 8am-6pm Monday to Friday. You can contact the LRS Service Desk between Monday to Friday 8am to 6pm (refer to the Help and Support section).

Please refer to the LRS Maintenance Schedule on Gov.UK for a list of outage windows. The outages are used for application upgrades, operational changes and any essential work to maintain the service.

1.8   Test data

LRS will make test data available to in the form of:

- Unique Learner Numbers (learner information only)

- Unique Learner Numbers + Personal Learning Record (achievement data) – LRB test script WBS48
- Unique Learner Numbers - learners who have opted out of sharing their PLR
- Linked Unique Learner Numbers (master and child records linked together)
- Achievements (learner information plus achievement data) – AO test script WBS45
- Achievement data ONLY (achievement data)

The ULN test data available is ONLY for testing purposes and doesn't need to be protected for sensitive reasons.

However, you are able to create your own test learners or achievement data via batch files or the portal.

> **Key Point: DO NOT use real learner data within the test environment for security reasons**

1.9   Qualification test data for AO web service products

Compatibility has a copy of Ofqual regulated qualification reference data to allow for realistic testing using real qualification data.

We don't refresh the reference data on a regular basis. If we do update it will completed during a maintenance outage.

The full data loaded includes valid start and end dates, grading structures and derived descriptions.

In addition, we have preloaded some achievement records created for a 'dummy' AO which has the title of Test AO. Largely, we would expect an AO to create their own achievements in the course of their testing of the achievement maintenance function. These cannot be amended by another AO so will always be available for testing.

1.10   Getting help

You can receive assistance from the LRS Service Desk, although they will only give advice on the web service functions, definition, procedures for registration and compatibility testing.

They are not able to comment on code you have written or if your implementation model is acceptable. They also won't be able to provide advice for installing the web service certificates on your local machines as each customers setup is different.

They can be contacted by telephone on 0345 602 2589 or emailing lrs.support@education.gov.uk.

2 Compatibility Check (final sign-off)

This is the final step before the solution you have developed goes live and your customers can begin to connect. As part of our duty of care LRS checks the developed interface meets the standards set by LRS.

In addition, we are responsible for protecting the learner information recorded. Although the web services protect the system from data corruption the web services definition cannot protect against misuse of the web services.

In order to safeguard this information we have to ensure that all bodies that use the information whether reading, writing or updating it, fully understand how the information is stored and what the effect would be of errors getting into their own system.

To ensure that the LRS has a stable database, we have to make sure that certain rules are followed mainly around data quality. LRS has devised a simple, data-driven Compatibility Check process. This will not prevent you from creating errors in your own records or of transmitting those errors in to LRS and beyond.

The benefit from this testing process is that we can prove compatibility between your application and the LRS database in terms of acceptable record contents and data formats. For example, our system expects dates to be in the format of YYYY-MM-DD but some other systems produce DD-MM-YYYY. The risk is that this error may not be realised until some months later, when a massive piece of work would be required to correct the errors. Another problem can be the swapping of Forename (Given name) and Surname (Family name).

LRS cannot prevent operator errors happening post-compatibility checks, we can only show that your system processes data correctly to us when used correctly.

These results will prove that your system handles the data correctly and that it can cope with normal error messages generated by LRS, e.g. ULN not found or multiple possible records etc.

> **Key Point: To get your interface compatibility checked, you need to fill in the Compatibility Check Request Form and return this form along with the evidence needed for sign-off.**

2.1 Applying for compatibility testing

When you are ready to apply for a Compatibility Check, ensure you only run tests for the number of functions you've requested. Upon successful Compatibility checking you will be given access to those functions only. Access to the rest of the functions will require a new set of tests to be undertaken prior to use.

2.2 Compatibility check evidence

For compatibility checking you need to supply:

- A completed Compatibility Check Request form.
- Mapping of the fields in your solution to the fields in the Learning Records Service (e.g. your solution may hold the learner's name in one field (Name) and the Learning Records Service has 3 fields (Given Name, Family Name and Middle Other Name).
- Response and Error Code evidence – Appendix A + snapshots or Appendix B + snapshots (batch)

- Completed Compatibility Test Scripts for relevant web services.
- Evidence of test results for each web service functions you are implementing.

Once we have received this information, we will endeavour to complete the checks within 10 working days. We may contact you for more information or evidence to finish the compatibility checks or to improve our understanding of the business model.

2.3   Compatibility check request form
The form asks a series of questions to determine you have understood the requirements and have correctly implemented the functionality in your system. You only need to answer the questions relevant to the web services you are submitting for checking.

2.4   Compatibility test scripts
The test scripts, are designed to return specific results against predetermined data in the LRS. You only need to run the test scripts for the web service products you have developed. Only products, which successfully pass the Compatibility Checks, will be signed-off. Each script includes the data to complete the tests.

The evidence returned as part of the Compatibility Check can be in the following format:

- a copy of the XML message string,
- a simple screen print of the result of the action for simple single searches, or
- a listing of the results coming back for other types of searches.

Please follow each step exactly as errors may give a false/wrong result that could result in you failing the compatibility process. The tests are based on using precise information in order to generate the specific results. Not all tests will generate a positive result as we have to ensure that your system can cope with error messages.

2.5   Which test scripts do I run?
The test scripts you run depends on which web service products you plan to implement

There are scripts for LRB products, for example creating/updating ULNs including batch and scripts for AO products for example creating, updating, withdrawing and reinstating achievements.

There are two spreadsheets with scripts:

- Compatibility Verify, Submit Achievement batch script - for Awarding Organisations or LRBs developing against verify
- Compatibility Find, Register, Submit batch and Get learner record Test Scripts – for LRBs

You will get access to the scripts at the same time as you apply to start development.

Appendix A is a list of the test scripts associated to each product

2.6   Evidence of test results
Email the completed Compatibility Check Form along with the test script evidence to the lrs.support@education.gov.uk.

These will then be marked to verify the outcome. If any Test Scripts or questions fail we will contact you and provide the necessary guidance to help make the model work (refer to section 2.6 and 2.7).

2.7 Re-testing

Should your Compatibility Check Report state that any, some or all of your Test Scripts have failed, this means you will have to re-test these.

You will need to:

1. Book a Compatibility Week test period
2. Run the re-test scripts together with: Evidence & Compatibility Check Request Form

It may be that you need to perform some re-development work before you can book another test slot.

2.8 Re-testing advice

In order to continue testing the following advice is given:

- If a 'Find' operation returns more records than expected due to previous test cases, then the LRS Organisation Portal will accept find results which include test result names which include a version number.
- If a submitted batch fails, this will not be a problem. However, if a job is submitted correctly but you find that the content is incorrect, then cancel the batch job before it is processed. If the error is not identified until after the job is processed, you will need to look closely at the results and make necessary modifications to the records to create a different learner.
- Ensure that you can identify when a Master ULN has been returned.
- If you do not complete your testing within the week, please note that the test data will probably change between initial and any secondary testing periods

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3 Post Compatibility Check

Once you have passed the Compatibility Checking and received a Compatibility Check Report, the next step is to apply for access to the Production Environment (go live).

You will need to provide your customer with a copy of the Live Web Service Connection form to all users, as they will not have access to this. Unless you are developing for your own organisation, you will not be able to submit this on their behalf.

Appendix A

Web service operations	Description
Find learner by ULN	A 'Find' must precede a Register. LRS will not allow a 'Register', to be performed unless a 'Find' has taken place. If this does not take place, a WSRC0021 error code will be returned. If you are implementing 'Find learner by ULN' execute and complete the scenarios in the WS.Find by ULN tab. Find = Find learner by ULN or Find learner by demographics
Find learner by demographics	Execute the scenarios in the WS.Find by Demographics tab.
Register single learner	Execute and complete the scenarios in the WS.Register Single Learner tab. When the test requires you to enter the test data to register a new learner, the minimum set of data is provided in the test scripts. For testing purposes, this is all that is required. Obviously, in real life you will have a lot of extra details but to complete the test simply use the test data provided in the test script.
Update learner	Execute and complete the scenarios in the WS.Update Learner tab. These are for testing purposes only but in real life, there are certain restrictions on when the Ability to Share field and the Verification field can be updated. Please refer to the LRB User Guide and How to prepare an LRB batch guide for more information.
Submit batch learner registration	Execute and complete the scenarios in the WS.Batch Learner Registration tab.
Get batch learner registration	In order to test that both functions operate correctly, we need you to create a batch message, submit the batch message, wait for the batch processing to be completed and receive the output of the completion codes for each record within your transaction. Some of the learner records in the batch will be successful and some will fail. Please be aware of the following: 1. When you submit the batch using the Submit Batch Learner Registration web service, you will be given a Job ID for that job – you will need this for the Get Batch Learner Registration Output call. 2. If you decide not to use Web Services to retrieve the batch, you can view the results via the LRS Organisation Portal. 3. Due to the way the results are passed into your application, you will need to provide proof of processing by performing screen

| | dumps of the actual records or providing the XML text for the output returned.

Remember: ensure the test scripts are run in the Job Type expected as this can affect the results. There are two Job Types:

CHK: Use if wishing to verify the ULN details, no registration or updates will be performed. Return codes will be returned. It is recommended that this type of check is carried out periodically to ensure the LRS Organisation Portal and your solution/customer's solutions are up-to-date.

FUL: Use if wishing to register a learner for a ULN. Return codes are returned. |
|---|---|
| Get learner learning events (PLR) | Execute and the scenarios in the WS.Get Learner Record tab. |
| Verify learner details | Execute and complete the scenarios in the WS.Verify Learner tab. |
| Submit verify learner details batch | |
| Get verify learner details batch output | |
| Submit achievement batch job | Execute and complete the scenarios in the WS.SubmitAch.Create, WS.SubmitAch.Update, WS.SubmitAch.Withdraw and WS.SubmitAch.Reinstate tab. |
| Get achievement batch job | |

Troubleshooting

Be aware that other organisations will be testing at the same time as you. Any unnecessary create or update actions can damage your, or other organisations' data, or causes the test scripts to return invalid results. If you are experiencing technical difficulties, please report these to the LRS Service Desk by contacting them on 0345 602 2589 or emailing lrs.support@education.gov.uk, providing as much detail as possible (preferably e-mailing screenshots where possible).

Below are some of the common problems and answers to performing compatibility testing within the LRS Compatibility Environment.

Question	Answer
How do I know I am connected to the correct test environment?	The test environment banner on the online portal will have a different title to the live service. The Compatibility states Compatibility Environment.
Can I ask for an extension to a test period?	Yes, however this is based on availability. Please respond directly to the email from LRS Business Support in order to request an extension.
Can I create additional users in the test environment?	Yes. We will provide you with a Super User account, who can create additional users for you. Please note that any new user accounts will be removed 5pm on Friday during the weekly compatibility refresh.
Can I request batch processing during the day?	No, you cannot request batch processing because it is scheduled to run every 5 to 10 minutes during the day.
Can I submit Test results in paper form?	Yes. We accept electronic or paper copies. You will need to request the postal address from our Service Desk directly if required.
What evidence is required?	Evidence can be: a copy of the XML message string (this can be copied into, a simple screenshot of the result of the action for simple single searches, or a listing of the results coming back for other types of searches. The evidence provided must clearly show the result of each test.
What can I do if I fail the tests?	You can reapply for compatibility check again at any time. You will need to resubmit those test scripts that failed using the Compatibility Test Re-Take Scripts and provide the results for each web service which you previously failed.
I keep getting a WSRC0021 code returned.	If you are attempting to register a learner, have you checked that you are performing a Find first? If not, a Find must precede a register.