

Content Development and Deployment Process and Standards

Supported Standards (SCORM, AICC)

At the time of writing Oracle iLearning supports SCORM 1.2 RTE-1 (mandatory data fields only) and AICC (mandatory data fields only).

Provided courseware is developed and tested to these sets of standards, courseware will run and track on the system.

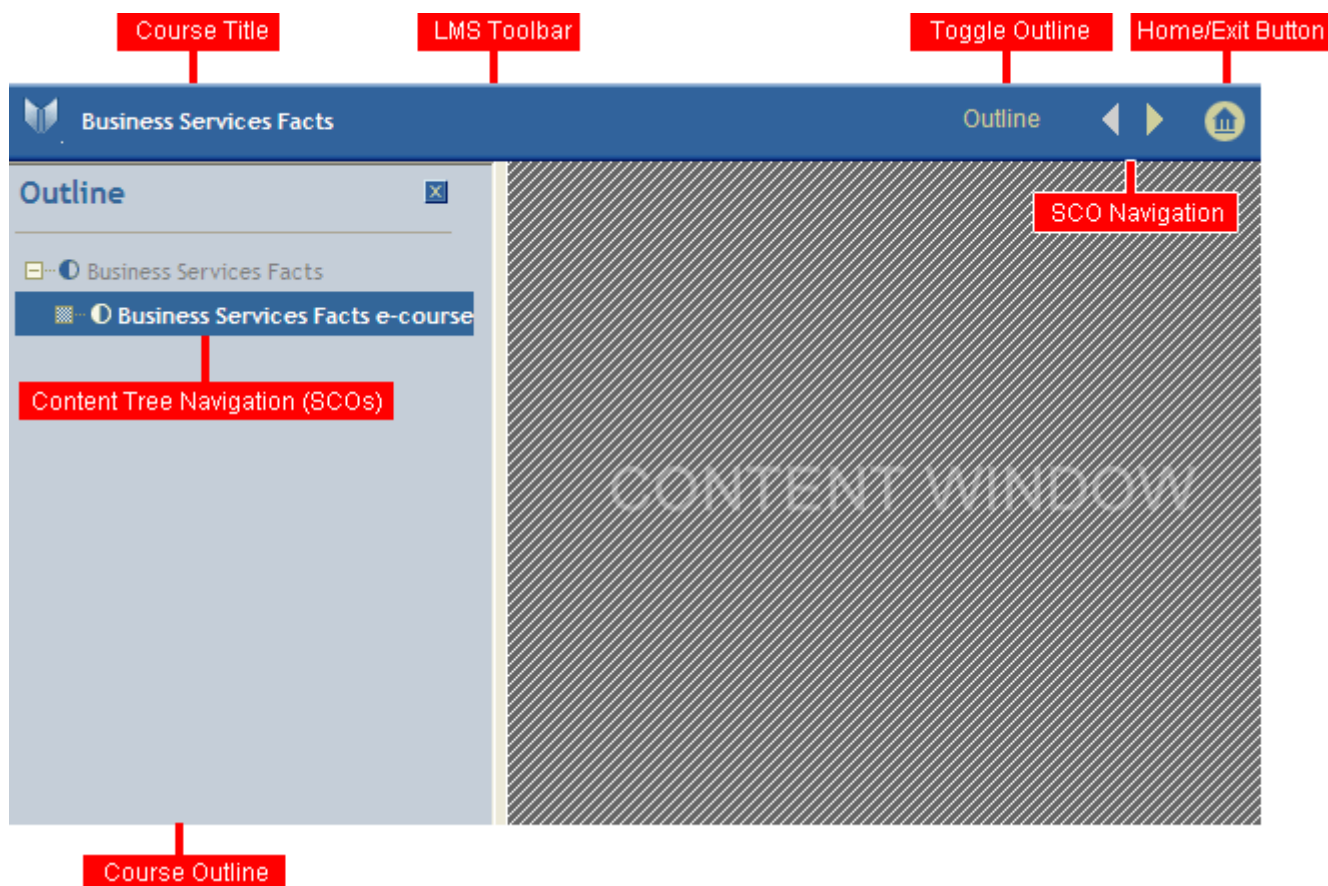
For SCORM courseware we would highly recommend frequently testing on products such as the ADL TestSuite and Reload SCORM Player throughout the development cycle.

NOTE: Oracle iLearning is currently going through a process of development and review to meet the requirements for SCORM 2004 certification. It is likely that Oracle iLearning will be SCORM 2004 certified at the end of June (2010).

SCORM is the preferred format as it is easier to import and deploy as it is a single step.

Deploying AICC content requires a little more overhead as the import and upload of content is a 2 step process. That's not to say it can't be done if there is a compelling reason for using the AICC.

The Oracle iLearning Course Player Interface



The player has a number of display options within iLearning and we recommend a standard is set for the sake of the learner and this is followed by all providers:

- The previous and next buttons can be removed if it is a single SCO.
- The Outline can be detached from the player (We recommend this is not done)

The player and its functions will also change shortly with the full release of SCORM 2004. Navigation between individual content objects will be possible from within the content.

Navigation between SCOs (content objects)

The Oracle iLearning LMS provides 2 methods for navigation between SCOs.

A next and previous button is provided on the LMS Toolbar. This navigation method allows the user to navigate linearly through a course that contains multiple SCOs.

A content tree structure is provided in the Course Outline which provides a much more open method of navigation between SCOs. The Course Outline also allows users to see their progress through a course as it provides a visual indication of the status of each SCO and the number of total SCOs.

If deploying content with multiple tracked content objects using AICC or SCORM 1.2 either the LMS Toolbar or Course Outline must be used to navigate between the content objects.

The ability to navigate between content objects from within a course will be a feature of SCORM 2004.

Player Pre-requisites

The Oracle iLearning LMS provides functionality to control the order in which SCOs of a multiple SCO course can be accessed. For example you may wish to force linear progress through each of the SCOs. This can be defined in the LMS using Player Pre-requisites.

Explaining how to set up player pre-requisites is beyond the scope of this document but it is important to know the functionality exists within the LMS.

Manifest Documents and AICC Metadata

Please make good use of SCORM manifest documents and AICC metadata. They should be used for their purpose, to define the content tree structure, name the course and nominate the initial launch file. Populating other metadata such as course description and audience can also be useful.

Be conscious that the mastery score is not supported and an internal mastery score should be used to calculate a pass/fail.

NOTE: In the past Oracle iLearning has not supported the ADL SCORM 1.2 schema files. This has now been fixed and it is no longer a requirement to use Oracle specific SCORM 1.2 schema files.

Correctly Packaging Content into Zip Files

It's a small issue, but one we all lose a lot of time to and so is extremely important to get right.

Ensure your content is packaged (Zipped) according to the SCORM and AICC specifications. The manifest and metadata files should be in the **root** of any content package delivered.

Nested content packages (Zips) give our client a lot of frustration as they just do not import and unzip correctly into the LMS.

SCORM, AICC and AUTO Tracking

Through the experience of watching where things can go wrong we have put together a few standards on tracking of your courseware. These are best practice for Oracle iLearning and present a much better chance for a successful and pleasant courseware deployment on launch day and into the future of your courseware. These standards will be verified on every piece of content loaded into the LMS.

Lesson Status

Ensure that a lesson status, especially completion is not reliant upon a user interaction. The lesson status should be communicated to the LMS passively. Relying on user interaction is unreliable and has caused many instances of courses remaining incomplete when learners insist they have completed them.

Score

Score must be written to the LMS as a percentage based score. This provides consistency across all courseware and is simpler to understand outside of the context of a course. For example a quiz that contains 12 questions and the learner answer 10 correctly. Writing a score of 10 to the LMS does not mean much without knowing it is a score out of 12, whereas a score of 83% does not require the same context.

Lesson Location

Rather than writing a lesson location on every page visit, do this passively at key stages of the course. A current lesson location can be saved on Save & Exit of the course. This has to be judged by the developer as I know the nature of some courses will require a lesson location to be saved on every page. How this is done should be communicated as part of the design specification.

Frequency of LMSet and LMSGet

I have seen some awful instances of piles and piles of data being written to the LMS as each page is loaded, `suspend_data`, `lesson_location`, `lesson_status`, even without change.

Make your logic a bit smarter and only write a change to the `lesson_status` on a change of the actual value, the same goes for `suspend_data`.

Over frequent communication can really slow things down. Admittedly the worst offenders have been authoring tools from Adobe. From memory Lectora hasn't been too bad.

If possible, maintain a local version (client side) of data values so that you do not have to LMSGet every time you need to know the current value.

Frequency of AICC POSTS

Because of the nature of AICC you are posting a large amount of data each time anything needs to be updated on the LMS. With this being the case, post smartly. Don't update data on every page load if nothing significant has changed, only POST on milestones such as `lesson_status`, `score` and `suspend_data` change. Use your own judgement, but be conscious of the overhead frequent posts can cause.

Auto Tracking

Oracle iLearning provides for content that is not SCORM or AICC compliant and allows the administrator to nominate "Auto" as the tracking type. This can be useful for deploying a PDF document. Auto tracking detects the launching of a piece of content and marks it completed. **Do not** use native Word, PowerPoint formats, we strongly recommend converting to PDF or HTML if wanting to display any content from a PowerPoint or Word file. Using PDF will provide a consistent result across most browsers and will not prompt any security exceptions.

Test, Test, Test and then Test Again

For you, your wonderful clients and our sake, please test your SCORM courseware to confirm it is compliant. For AICC content, if you do not have provisions to test the courseware, request permission to test the content early on your clients system.

This will make for a much more pleasant deployment. If we are all confident the courseware is running and tracking fine on the system it allows us to focus on individual issue and SME review much easier.

Error Checking

Occasionally content will fail to write data to the LMS. If a problem like this occurs and continues to occur it may be that the content will no longer communicate with the LMS until the user has exited and re-launched the content. In these instances we strongly recommend that the learner is notified that a fatal error has occurred.

There have been instances where courses have failed silently and users have progressed to the end of the course unaware that their progress has not been tracked at all.

SOE (Standard operating environment)

Ensure the content has been developed for the correct standard operating environment.

Things you should especially be aware of are:

- Target browser vendor(s) and version(s) that are required to be supported. Also consider future proofing if developing for older browsers such as IE6 and IE7.
- Target operating system
- Screen resolution and screen real estate available
- Ability to play back video and audio.
- Plugins available such as Adobe Flash, Adobe PDF etc.
- Bandwidth

Cross Domain

Attempting to script across different domains causes big problems with courses and can lead to complete failure in the course launching.

Be conscious that courseware and LMS are most likely going to be on separate domains and any courseware developed should not attempt to control the LMS in any way.

When deploying SCORM courseware on a content server outside of Seertech Solutions, the Oracle iLearning CMI Adapters can be installed to facilitate communication between the content and LMS through the SCORM API.

When deploying AICC content using HACP on a content server outside of Seertech Solutions, a proxy must be used. Due to the nature of AICC a one size fits all proxy cannot be developed to distribute.

See the section titled [Content Hosted Externally](#) for more information.

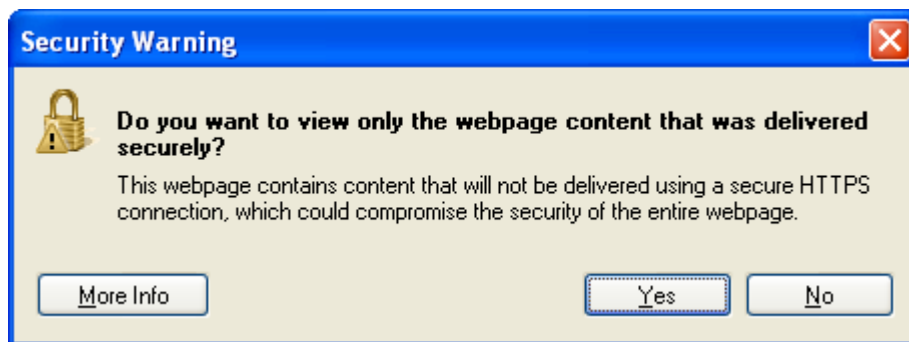
Loading Content from an Unsecure Source

The LMS and content server uses a secure protocol (HTTPS). What this means is that courses that reference external URLs using HTTP tend to generate the annoying IE popup, which became more annoying in later versions of IE when they swapped the YES, NO answer around.

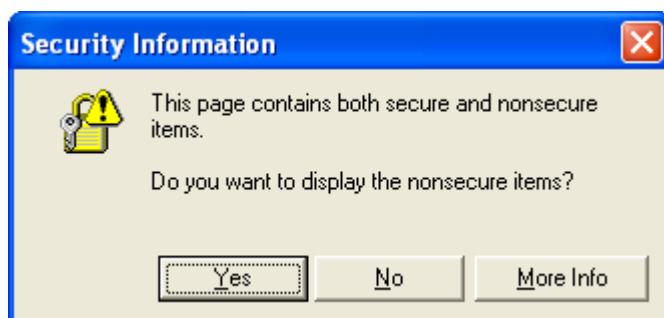
If possible always use relative paths to URLs. If linking to an external file, please use HTTPS if available.

The issue has been quite serious in some cases and has prevented some courses from running at all as the learner has disallowed content from an unsecure source to be loaded. In several instances the reference to HTTP was found in the CODEBASE attribute of a Flash Object.

We recommend removing the CODEBASE attribute from Flash Objects or using HTTPS to reference the CODEBASE.



The popup as it appears in IE7 and IE8 – Answering No allows you to load unsecure content.



The popup as it appears in IE6 – Answering Yes allows you to load unsecure content.

Save and Exit

The way your Save & Exit button behaves is determined by the way your content is presented to the learner, in a popup, or in the course player window.

Popup

If the content is presented in a popup window, your Save & Exit button should provide the functionality of closing the communications with the LMS and closing down the popup window.

A further great enhancement would be to update the window.opener with instructions on how the learner should now exit the LMS Course Player window.

Course Player window

If the content is presented in the course player window, the content should **not** attempt to close any browser windows. The Save & Exit button should close communications with the LMS.

Once communications have successfully been closed with the LMS, you should then instruct the learner on how to exit the LMS Course Player.

Position

Position your Save & Exit button in a consistent area of the course screen. This may be dictated by the most common position that already exists.

The top right of the content screen appears to be a more consistent location for the button.

Simply position the Save & Exit button in a consistent and easy to find location will improve the usability and chance of the course tracking the users data.

General Information

It is not wise to rely on Save & Exit to write key data to the LMS. Any key information should have already been successfully committed to the LMS, especially in the case of presenting the course in a popup window as the act of closing the window can cause the data transfer to end prematurely.

To ensure that the course is exited properly and that all data is saved to the LMS, it is recommended that the LMS Toolbar Home button is used.

Presenting Content in a Popup or within the LMS Course Player

There are 2 ways that you can present your content to the learner, either within the LMS Course Player or by launching the content in a popup window from the course player window.

Popup

If presenting content in a popup window, Oracle iLearning provides the functionality. After importing content into the LMS, each SCO required to be opened in a popup window must have the "Open in new window" option selected. The LMS does not provide the ability to specify the size of the popup window and therefore you must build in the required **parent.resizeTo()** functionality if required. Because the LMS controls this popup window, it will also automatically close the window should the opener be closed, preventing orphaned windows. This is an important factor when dealing with multiple SCO courses.

You should be conscious that if the course is a multiple SCO course, to navigate to another SCO the learner must close the open popup window and use the LMS Course Player Toolbar or Course Outline to navigate to the next SCO.

NOTE: If you would like to take control of the popup window by launching a new window from an initial launch page you must include functionality in the opener to close the popup window, should the opener be closed without first closing the popup window. This is very important as it prevents orphaned popup windows which can and have caused problems with content, resulting in lost data.

Example Script in window.opener

```
<script>
// gPopupWin is a reference to the popup window object.
// gClosed flag indicates if function is already called.
// try{}catch{} used as window object may already be closed properly.

var gClosed = false;
function windowClose() {
  if(!gClosed) {
    try{
      gPopupWin.close();
      gClosed = true;
    }catch(e){
      return;
    }
  }
}
</script>
<body onUnload="windowClose()" onBeforeUnload="windowClose()">
```

Course Player

Content can also be launched within the course player. You should be aware that there could be minimal screen real estate available based on the need for the course outline and LMS toolbar which both can contain essential navigation for the course.

Case Sensitive File Names

It is essential that all links to internal assets should be checked to make sure that they are all valid and will not break when run on a case sensitive content server.

The Oracle iLearning content server is a UNIX based operating system and will treat INDEX.HTM and index.htm as two completely separate files.

Adobe Dreamweaver provides functionality to check for broken links on a site definition. You can also specify that the check should be case sensitive under the site properties.

Content Hosted Externally

If SCORM or AICC (HACP tracked) content is being hosted externally (not by Seertech) it must make use of a proxy to facilitate communication between the content and LMS to prevent any cross-domain scripting errors.

If there is a compelling reason to host content externally a proxy must be used.

For SCORM courseware, the Oracle iLearning CMI adapters must be installed on the external content server and the CMI adapters will also need to be registered on the client LMS.

For AICC courseware the content must use a proxy to POST data to the LMS. The proxy should be provided by the vendor if they have determined the content must be hosted by themselves or on another server. The AICC metadata should reference the proxy and external URL so that there is no requirement for Westpac to tweak settings when importing the data.

Again, there should be a compelling reason to host content externally as it does introduce another point of failure and makes troubleshooting content failures and assigning responsibilities much more difficult with the introduction of 3rd party infrastructure.