



# IMI Authoring Tools Publishing Guide

09 June 2021

Version Number	Version Date	Update	Purpose
5	09 June 2021	Storyline 360 Update	Scormdriver. js for Storyline 360 build before version 3.39.21985.0
4	18 February 2021	Storyline 360 Update	Code Modification
3	17 December 2020	Adobe Captivate	Unlimited Attempts
2	07 April 2020	Lectora Desktop	Add the Lectora Desktop modification information
1	01 April 2020	Baseline Version	Original

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## Introduction

The purpose of this guide is to provide developers with code modifications to allow courseware to run properly on the Army Learning Management System (ALMS). The code modifications within this guide apply to Captivate, Storyline 360 and Lectora.

# Captivate Code Modifications for ALMS and SCORM Testing

*Last modified: 31-Mar-20*

## Overview

The code modifications in this document are designed to allow Captivate projects to roll up successfully in the Army Learning Management System (ALMS) when published for SCORM 2004 3<sup>rd</sup> edition. The modifications should assist with creating SCOs that pass the SCORM conformance test. The modifications are made to files in the Adobe Captivate installation directory, which allows the files to be automatically applied to published courseware. This method removes the need to modify multiple files in each published PIF. This saves time and decreases the chance of errors due to typos or forgetting to modify a file. **However, because this method modifies the Adobe Captivate installation files, it is important that you back up these files before making any of the code modifications shown below.**

## Version Information

This document applies to IMI courseware developed in Adobe Captivate 2019. However, many (if not all) of the code changes may be directly applicable to previous versions, depending on the variation of installation files.

# Publish Configuration

A: Click the “SCORM 2004” link to open the “**Preferences**” window.

Publish for Devices

Publish as: HTML5

Project Title:

Location:

Zip Files

Adobe Fonts Domains:

Add up to ten domains, e.g. \*.adobe.com, localhost, 127.0.0.1

Slides: 40	Mobile Gestures: <a href="#">No</a>
Slides With Audio: 0	Geolocation: <a href="#">No</a>
Audio Settings: <a href="#">Custom</a>	Accessibility: <a href="#">Yes</a>
Display Score: <a href="#">No</a>	eLearning output: <a href="#">SCORM 2004</a>

**B:** Check “**Enable reporting for this project**” to enable all the LMS options in this window.

**C:** Change the “**LMS**” to “**Other Standard LMSs**”;

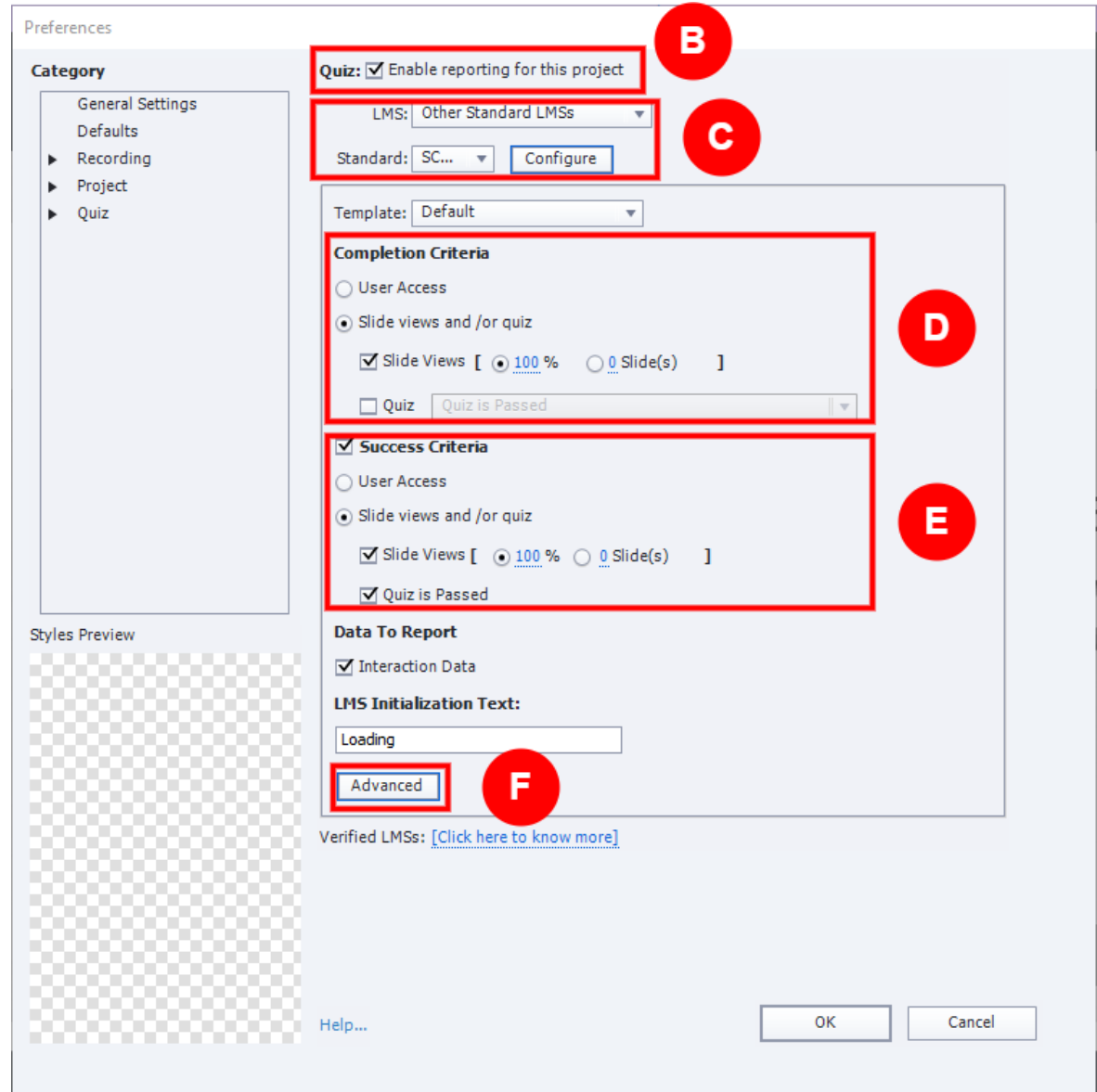
Change the “**Standard**” to “**SCORM 2004**”;

Click “**Configure**” to open the “**Manifest**” window.

**D:** Set the **Completion Criteria**.

**E:** Set the **Success Criteria**.

**F:** Click the “**Advanced**” button to open the “**Advanced LMS settings**” window.





**G:** Select “3rd Edition”

**H:** Fill in the manifest information

Manifest

SCORM Version

SCORM Version : SCORM 2004

2nd Edition

3rd Edition **G**

4th Edition

Course

Identifier: Course\_ID1

Title: SDC-R

Description:

Version: 1.0

Duration: 0 : 0 : 0 (hh:mm:ss) **H**

Keywords: (separate multiple values by commas)

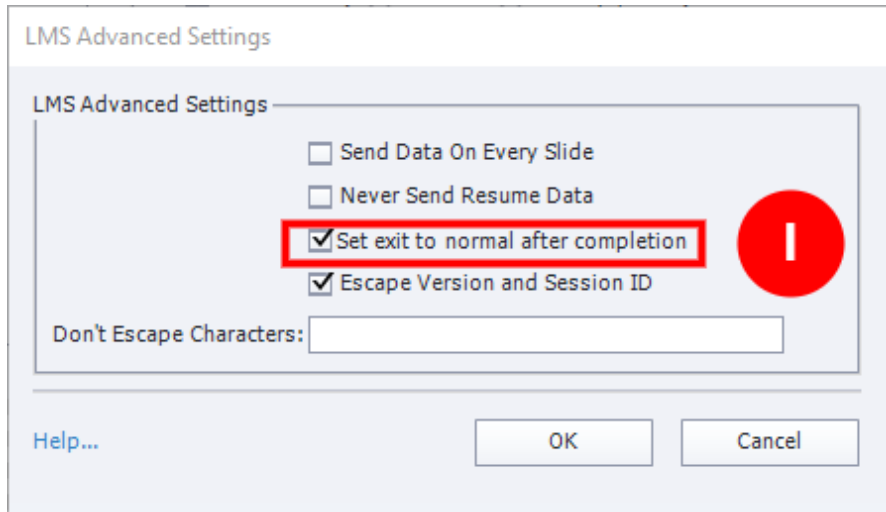
SCO

Identifier: SCO\_ID1

Title: Course Object title

Help... OK Cancel

I: Check **“Set exit to normal after completion”**



## Code Modifications

Below are the code modifications for the Adobe Captivate installation files. **Be sure to make backups of all files before you modify them.** If you don't, you will have to reinstall the software to revert the modifications. Each code modification below is followed by a note that explains the modification.

C:\Program Files\Adobe\Adobe Captivate 2019 x64\Templates\Publish\LMS\Standard\SCORM\Default\2004\scormdriver.js

Original	<pre>function SCORM2004_Finish(strExitType,blnStatusWasSet){WriteToDebug("In SCORM2004_Finish strExitType="+strExitType+", blnStatusWasSet="+blnStatusWasSet);var strStatusAfterCompletion;var blnResult=true;SCORM2004_ClearErrorInfo();if((strExitType==EXIT_TYPE_FINISH)&amp;&amp;!blnStatusWasSet){WriteToDeb ug("Getting completion status");strStatusAfterCompletion=SCORM2004_GetCompletionStatus();WriteToDebug("Setting completion status to "+strStatusAfterCompletion);blnResult=SCORM2004_CallSetValue("cmi.completion_status",strStatusAfterCompletion) &amp;&amp;blnResult;} if(strExitType==EXIT_TYPE_SUSPEND&amp;&amp;USE_2004_SUSPENDALL_NAVREQ){WriteToDebug("Setting adl.nav.request to suspendAll");blnResult=SCORM2004_CallSetValue("adl.nav.request","suspendAll");} WriteToDebug("Setting Exit");blnResult=SCORM2004_CallSetValue("cmi.exit",SCORM2004_TranslateExitTypeToSCORM(strExitType))&amp;&amp;bln Result;WriteToDebug("Calling Commit");blnResult=SCORM2004_CallCommit()&amp;&amp;blnResult;WriteToDebug("Calling Finish");blnResult=SCORM2004_CallTerminate()&amp;&amp;blnResult;WriteToDebug("Returning "+blnResult);return blnResult;}</pre>
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<p>Modified</p>	<pre>function SCORM2004_Finish(strExitType,blnStatusWasSet) { WriteToDebug("In SCORM2004_Finish strExitType="+strExitType+", blnStatusWasSet="+blnStatusWasSet); var strStatusAfterCompletion;var blnResult=true;SCORM2004_ClearErrorInfo(); if((strExitType==EXIT_TYPE_FINISH)&amp;&amp;!blnStatusWasSet){WriteToDebug("Getting completion status"); strStatusAfterCompletion=SCORM2004_GetCompletionStatus(); WriteToDebug("Setting completion status to "+strStatusAfterCompletion); blnResult=SCORM2004_CallSetValue("cmi.completion_status",strStatusAfterCompletion)&amp;&amp;blnResult; } if(strExitType==EXIT_TYPE_SUSPEND&amp;&amp;USE_2004_SUSPENDALL_NAVR EQ) { WriteToDebug("Setting adl.nav.request to suspendAll"); blnResult=SCORM2004_CallSetValue("adl.nav.request","suspendAll"); } WriteToDebug("Setting Exit"); blnResult=SCORM2004_CallSetValue("cmi.exit",SCORM2004_TranslateExitTypeToSCORM(strExitType))&amp;&amp;blnResult; <b>WriteToDebug("Setting adl.nav.request to exit");</b> <b>blnResult=SCORM2004_CallSetValue("adl.nav.request","exitAll")&amp;&amp;blnResult;</b> WriteToDebug("Calling Commit"); blnResult=SCORM2004_CallCommit()&amp;&amp;blnResult; WriteToDebug("Calling Finish"); blnResult=SCORM2004_CallTerminate()&amp;&amp;blnResult; WriteToDebug("Returning "+blnResult); return blnResult; }</pre>
<p><b>Note</b></p>	<p>This code modification adds the missing "<b>adl.nav.request</b>" call to the <b>SCORM2004_Finish</b> function. Without the "adl.nav.request" call, the SCO will stay "Not Evaluated" on the ALMS even when it is completed.</p>

C:\Program Files\Adobe\Adobe Captivate 2019 x64\Templates\Publish\LMS\Standard\SCORM\Default\2004\static\3rd\index.html

<p>New</p>	<pre> &lt;!DOCTYPE html&gt; &lt;html&gt;   &lt;head&gt;     &lt;title&gt;Launch&lt;/title&gt;     &lt;meta http-equiv="X-UA-Compatible" content="IE=edge" /&gt;     &lt;meta charset="utf-8" /&gt;      &lt;script type="text/JavaScript"&gt;       var contentWindow       function openContentWindow () {         contentWindow = window.open(           "index_scorm.html",           "_blank",           "height=768px,width=1024px,status=0,toolbar=0,menubar=0,location=0,resizable=1"         )       }       function closeLaunchWindow () {         if (!contentWindow.closed) {           contentWindow.close()         }       }     &lt;/script&gt;   &lt;/head&gt;   &lt;body onLoad="openContentWindow()" onBeforeUnload="closeLaunchWindow()"&gt;     &lt;p&gt;The course is opened in another window.&lt;br&gt; Do not close this window in the middle of the course.&lt;/p&gt;   &lt;/body&gt; &lt;/html&gt; </pre>
<p><b>Note</b></p>	<p>An "index.html" file is created as the new launch page which pops up a window to open the old launch page of Adobe Captivate generated "index_scorm.html". The new launch page resolves the issue that SCORM communication is terminated prematurely when the browser window exit button is clicked, which leads to incorrect lesson status being saved. This method complies with the <b>Best Practice: Separate Content Window</b> and <b>Best Practice: Avoid Top-Level Window Closure</b> in the <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3</a>.</p>

C:\Program Files\Adobe\Adobe Captivate 2019 x64\Templates\Publish\LMS\Standard\SCORM\Default\2004\dynamic\imsmanifest.xml

Original	<pre> &lt;resource adlcp:scormType="sco" identifier="@RD_MQZ_MANIFEST_ID_RES" type="webcontent" href="@RD_MQZ_MANIFEST_HTM_NAME_HREF"&gt;   &lt;metadata&gt;     &lt;adlcp:location&gt;metadata.xml&lt;/adlcp:location&gt;   &lt;/metadata&gt;    &lt;file href="@RD_MQZ_MANIFEST_SWF_NAME"&gt;&lt;/file&gt;   &lt;file href="@RD_MQZ_MANIFEST_HTM_NAME"&gt;&lt;/file&gt;   @CP_INCLUDE_SCORMDRIVER   @CP_INCLUDE_SCORMDRIVER_RELATED_1   @CP_EXTERNAL_RESOURCES &lt;/resource&gt; </pre>
Modification	<pre> &lt;resource adlcp:scormType="sco" identifier="@RD_MQZ_MANIFEST_ID_RES" type="webcontent" href="index.html"&gt;   &lt;metadata&gt;     &lt;adlcp:location&gt;metadata.xml&lt;/adlcp:location&gt;   &lt;/metadata&gt;   &lt;file href="index.html"/&gt;   &lt;file href="vocab/custom.xsd"/&gt;   &lt;file href="vocab/loose.xsd"/&gt;   &lt;file href="vocab/strict.xsd"/&gt;   &lt;file href="unique/loose.xsd"/&gt;   &lt;file href="unique/strict.xsd"/&gt;   &lt;file href="extend/custom.xsd"/&gt;   &lt;file href="extend/strict.xsd"/&gt;   &lt;file href="common/anyElement.xsd"/&gt;   &lt;file href="common/dataTypes.xsd"/&gt;   &lt;file href="common/elementNames.xsd"/&gt;   &lt;file href="common/elementTypes.xsd"/&gt;   &lt;file href="common/rootElement.xsd"/&gt;   &lt;file href="common/vocabTypes.xsd"/&gt;   &lt;file href="common/vocabValues.xsd"/&gt;   &lt;file href="adlcp_v1p3.xsd"/&gt;   &lt;file href="adlnav_v1p3.xsd"/&gt;   &lt;file href="adlseq_v1p3.xsd"/&gt;   &lt;file href="datatypes.dtd"/&gt; </pre>

	<pre> &lt;file href="ims_xml.xsd"/&gt; &lt;file href="imscp_v1p1.xsd"/&gt; &lt;file href="imsmanifest.xml"/&gt; &lt;file href="imsss_v1p0.xsd"/&gt; &lt;file href="imsss_v1p0auxresource.xsd"/&gt; &lt;file href="imsss_v1p0control.xsd"/&gt; &lt;file href="imsss_v1p0delivery.xsd"/&gt; &lt;file href="imsss_v1p0limit.xsd"/&gt; &lt;file href="imsss_v1p0objective.xsd"/&gt; &lt;file href="imsss_v1p0random.xsd"/&gt; &lt;file href="imsss_v1p0rollup.xsd"/&gt; &lt;file href="imsss_v1p0seqrule.xsd"/&gt; &lt;file href="imsss_v1p0util.xsd"/&gt; &lt;file href="lom.xsd"/&gt; &lt;file href="lomCustom.xsd"/&gt; &lt;file href="lomLoose.xsd"/&gt; &lt;file href="lomStrict.xsd"/&gt; &lt;file href="SCORM_utilities.js"/&gt; &lt;file href="ScormEnginePackageProperties.xsd"/&gt; &lt;file href="xml.xsd"/&gt; &lt;file href="XMLSchema.dtd"/&gt; &lt;file href="@RD_MQZ_MANIFEST_SWF_NAME"&gt;&lt;/file&gt; &lt;file href="@RD_MQZ_MANIFEST_HTM_NAME"&gt;&lt;/file&gt; @CP_INCLUDE_SCORMDRIVER @CP_INCLUDE_SCORMDRIVER_RELATED_1 @CP_EXTERNAL_RESOURCES &lt;/resource&gt; </pre>
<p><b>Note</b></p>	<p>This code modification updates two things:</p> <ol style="list-style-type: none"> <li>1) It changes the courseware entry point to the launch page (index.html) mentioned above.</li> <li>2) It adds the missing file entries in the &lt;resource&gt; element. Adobe Captivate generated imsmanifest.xml file does not include the files in the <i>Templates\Publish\LMS\Standard\SCORM\Default\2004\static\3rd\</i> folder. Missing these file entries in the imsmanifest.xml will report errors in the SCORM conformance tests.</li> </ol>

Code modification for assessed content.

**IMPORTANT** - The code modification below applies only to the package which has assessed content.

Original	<pre>&lt;imsss:objectives&gt;   &lt;imsss:primaryObjective objectiveID="@RD_MQZ_OBJECTIVE_ID"/&gt; &lt;/imsss:objectives&gt;</pre>
Modified	<pre>&lt;imsss:objectives&gt;   &lt;imsss:primaryObjective satisfiedByMeasure="true" objectiveID="@RD_MQZ_OBJECTIVE_ID"&gt;     &lt;imsss:minNormalizedMeasure&gt;Your passing score&lt;/imsss:minNormalizedMeasure&gt;   &lt;/imsss:primaryObjective&gt; &lt;/imsss:objectives&gt;</pre>
<b>Note</b>	<p>This code modification adds the passing score to the package manifest. Adding <b>satisfiedByMeasure="true"</b> ensures that the completion status will be determined by the passing score. You need to replace the <b>Your passing score</b> with a minimal normalized measure (e.g., <b>0.8</b> or <b>0.6</b>) depending on your content design.</p>



C:\Program Files\Adobe\Adobe Captivate 2019 x64\Templates\Publish\LMS\Standard\SCORM\Default\2004\dynamic\metadata.xml

<general> ... </general>	
Original	<identifier> <catalog>URI</catalog> <entry>com.adobe.captivate.@CP_COURSE_IDENTIFIER</entry> </identifier>
Modified	<identifier> <catalog> <b>ATIA</b> </catalog> <entry> <b>TBD</b> </entry> </identifier>
<b>Note</b>	“ATIA” and “TBD” are values required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a> . SCOs will fail the SCORM conformance test without this modification.

<lifeCycle> ... </lifeCycle>	
New	<status> <source>LOMv1.0</source> <value>final</value> </status>
<b>Note</b>	In the <status> element, "LOMv1.0" and "final" values are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a> . You must add the <status> element between the <version> and <contribute> elements inside the <lifeCycle> element. SCOs will fail the SCORM conformance test without this modification.

metaMetadata> ... </metaMetadata>

<b>New</b>	<pre> &lt;metaMetadata&gt;   &lt;identifier&gt;     &lt;catalog&gt;TBD&lt;/catalog&gt;     &lt;entry&gt;TBD&lt;/entry&gt;   &lt;/identifier&gt;   &lt;metadataSchema&gt;LOMv1.0&lt;/metadataSchema&gt;   &lt;metadataSchema&gt;SCORM_CAM_v1.3&lt;/metadataSchema&gt;   &lt;metadataSchema&gt;ADLv1.0&lt;/metadataSchema&gt;   &lt;language&gt;en&lt;/language&gt; &lt;/metaMetadata&gt;         </pre>
<b>Note</b>	<p>The &lt;metaMetadata&gt; element is required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>, but is not generated by Adobe Captivate. You need to insert this element between the &lt;lifeCycle&gt; and &lt;technical&gt; elements.</p> <p>SCOs will fail the SCORM conformance test without this modification.</p>

<rights> ... </rights>	
<b>Original</b>	<pre> &lt;rights&gt;   &lt;copyrightAndOtherRestrictions&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;yes&lt;/value&gt;   &lt;/copyrightAndOtherRestrictions&gt;   &lt;description&gt;     &lt;string&gt;@CP_PROJECT_COPYRIGHT&lt;/string&gt;   &lt;/description&gt; &lt;/rights&gt;         </pre>

Modification	<pre> &lt;rights&gt;   &lt;cost&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;no&lt;/value&gt;   &lt;/cost&gt;    &lt;copyrightAndOtherRestrictions&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;no&lt;/value&gt;   &lt;/copyrightAndOtherRestrictions&gt;    &lt;description&gt;     &lt;string&gt;@CP_PROJECT_COPYRIGHT&lt;/string&gt;   &lt;/description&gt;  &lt;/rights&gt; </pre>
<b>Note</b>	<p>The &lt;cost&gt; element and “no” in &lt;value&gt; element inside the &lt;copyrightAndOtherRestrictions&gt; element are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. SCOs will fail the SCORM conformance test without this modification.</p>

<classification> ... </classification>	
<p>New <b>IMPORTANT SEE NOTE</b></p>	<pre> &lt;!-- This description is for the intended MOS and skill level of the student.--&gt;   &lt;classification&gt;     &lt;purpose&gt;       &lt;source&gt;LOMv1.0&lt;/source&gt;       &lt;value&gt;discipline&lt;/value&gt;     &lt;/purpose&gt;     &lt;description&gt;       &lt;string language="en-US"&gt;Your description&lt;/string&gt;     &lt;/description&gt;     &lt;keyword&gt;       &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;     &lt;/keyword&gt; </pre>

```
</classification>

<!-- This description is for the intended SQI of the student. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>discipline</value>
  </purpose>
  <description>
    <string language="en-US">Your description</string>
  </description>
  <keyword>
    <string language="en-US">Your keyword</string>
  </keyword>
</classification>

<!-- This description is for the intended ASI of the student. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>discipline</value>
  </purpose>
  <description>
    <string language="en-US">Your description</string>
  </description>
  <keyword>
    <string language="en-US">Your keyword</string>
  </keyword>
</classification>

<!-- This description is for the task numbers and task descriptions of the critical tasks for which this SCO/organization
provides training or support. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>educational objective</value>
  </purpose>
  <description>
    <string language="en-US">Your description</string>
  </description>
```

```

        <keyword>
          <string language="en-US">Your keyword</string>
        </keyword>
      </classification>

      <!-- This description is for the SCO's learning objective. -->
      <classification>
        <purpose>
          <source>LOMv1.0</source>
          <value>educational objective</value>
        </purpose>

        <!-- ***EDIT THIS*** -->
        <!-- This description is for the SCO's Learning Objective: Action, Condition, and Standard. -->
        <!-- If this is metadata for an organization (course), use the description from <general>. -->
        <description>
          <string language="en-US">Your description</string>
        </description>

        <!-- ***EDIT THIS*** -->
        <!-- This keyword/phrase needs to describe the main topic of the SCO, e.g. "M50 Protective Mask". -->
        <keyword>
          <string language="en-US">Your keyword</string>
        </keyword>
      </classification>

      <!-- This classification indicates 508 compliance or non-compliance. -->
      <classification>
        <purpose>
          <source>LOMv1.0</source>
          <value>accessibility restrictions</value>
        </purpose>
        <description>
          <string language="en-US">508 Compliant</string>
        </description>
        <keyword>
          <string language="en-US">508</string>
        </keyword>
        <keyword>
          <string language="en-US">PL508</string>
        </keyword>
      </classification>

```

	<pre>                 &lt;/keyword&gt;                 &lt;keyword&gt;                     &lt;string language="en-US"&gt;accessibility restrictions&lt;/string&gt;                 &lt;/keyword&gt;             &lt;/classification&gt;              &lt;!-- This classification is for the foreign disclosure rating. --&gt;             &lt;classification&gt;                 &lt;purpose&gt;                     &lt;source&gt;LOMv1.0&lt;/source&gt;                     &lt;value&gt;security level&lt;/value&gt;                 &lt;/purpose&gt;                 &lt;description&gt;                     &lt;string language="en-US"&gt;FD5&lt;/string&gt;                 &lt;/description&gt;                 &lt;keyword&gt;                     &lt;string language="en-US"&gt;FD5&lt;/string&gt;                 &lt;/keyword&gt;             &lt;/classification&gt;         </pre>
<p><b>Note</b></p>	<p>These &lt;classification&gt; elements are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. You need to append them as the last children of the &lt;lom&gt; element, and replace “<b>Your description</b>” and “<b>Your keyword</b>” with your own information.</p> <p>The comment above each &lt;classification&gt; element briefly explains the element. To learn more about the ALMS requirements for these elements, check <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. SCOs will fail the SCORM conformance test without this modification.</p>

Code Modification for unlimited attempts instructional strategy of assessment content.

Imsmanifest.xml

Original	<pre>&lt;imsss:rollupRules&gt;   &lt;imsss:rollupRule childActivitySet="all"&gt;     &lt;imsss:rollupConditions&gt;       &lt;imsss:rollupCondition condition="satisfied"/&gt;     &lt;/imsss:rollupConditions&gt;     &lt;imsss:rollupAction action="satisfied"/&gt;   &lt;/imsss:rollupRule&gt;   &lt;imsss:rollupRule childActivitySet="all"&gt;     &lt;imsss:rollupConditions&gt;       &lt;imsss:rollupCondition operator="not" condition="satisfied"/&gt;     &lt;/imsss:rollupConditions&gt;     &lt;imsss:rollupAction action="notSatisfied"/&gt;   &lt;/imsss:rollupRule&gt;   &lt;imsss:rollupRule childActivitySet="all"&gt;     &lt;imsss:rollupConditions&gt;       &lt;imsss:rollupCondition condition="completed"/&gt;     &lt;/imsss:rollupConditions&gt;     &lt;imsss:rollupAction action="completed"/&gt;   &lt;/imsss:rollupRule&gt;   &lt;imsss:rollupRule childActivitySet="all"&gt;     &lt;imsss:rollupConditions&gt;       &lt;imsss:rollupCondition operator="not" condition="completed"/&gt;     &lt;/imsss:rollupConditions&gt;     &lt;imsss:rollupAction action="incomplete"/&gt;   &lt;/imsss:rollupRule&gt; &lt;/imsss:rollupRules&gt;</pre>
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<p>Modified</p>	<pre> &lt;imsss:rollupRules&gt;   &lt;imsss:rollupRule childActivitySet="all"&gt;     &lt;imsss:rollupConditions&gt;       &lt;imsss:rollupCondition condition="satisfied"/&gt;     &lt;/imsss:rollupConditions&gt;     &lt;imsss:rollupAction action="satisfied"/&gt;   &lt;/imsss:rollupRule&gt;   &lt;imsss:rollupRule childActivitySet="all"&gt;     &lt;imsss:rollupConditions&gt;       &lt;imsss:rollupCondition condition="satisfied"/&gt;     &lt;/imsss:rollupConditions&gt;     &lt;imsss:rollupAction action="completed"/&gt;   &lt;/imsss:rollupRule&gt;   &lt;imsss:rollupRule childActivitySet="any"&gt;     &lt;imsss:rollupConditions&gt;       &lt;imsss:rollupCondition operator="not" condition="satisfied"/&gt;     &lt;/imsss:rollupConditions&gt;     &lt;imsss:rollupAction action="incomplete"/&gt;   &lt;/imsss:rollupRule&gt; &lt;/imsss:rollupRules&gt; </pre>
<p><b>Note</b></p>	<p>This modification applies the Army-recommended sequencing for SCORM 2004 3rd Edition DL products mentioned in the Army Business Rules and Best Practices Guide for Distributed Learning (DL) Development (version 1.3).</p>



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# Storyline Code Modifications for ALMS and SCORM Testing

*Last modified: 18-Feb-21*

## Overview

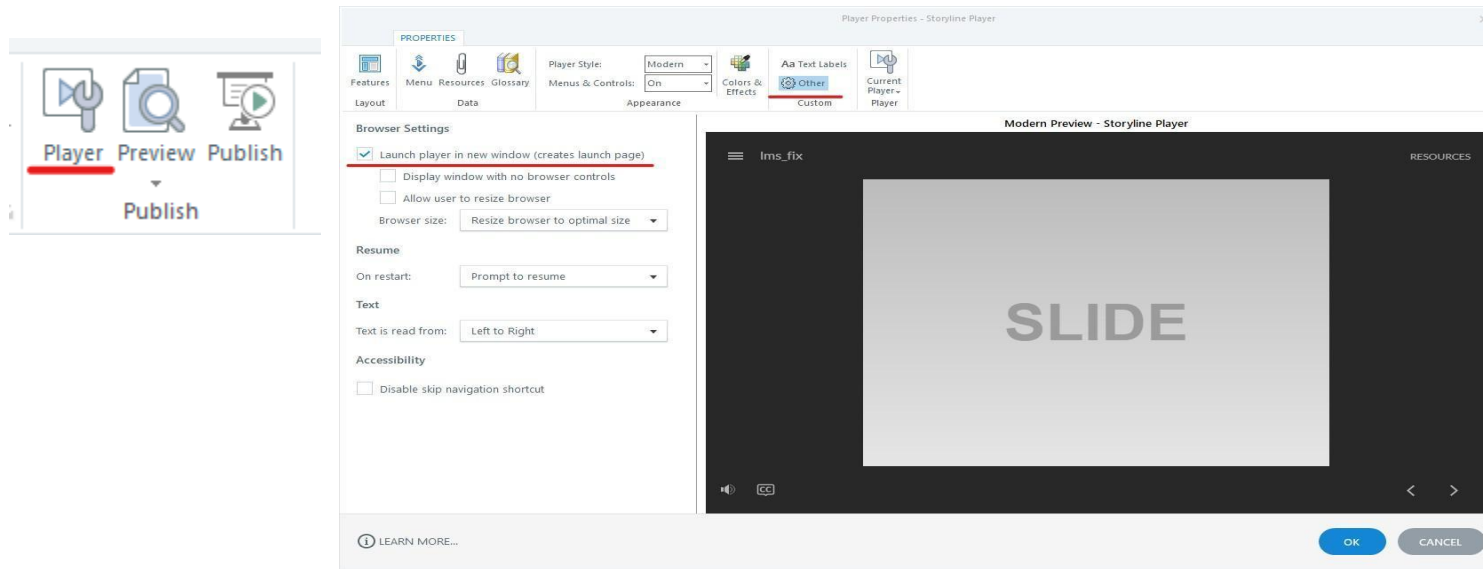
The code modifications in this document are designed to allow Storyline 360 projects to roll up successfully in the Army Learning Management System (ALMS) when published for SCORM 2004 3rd edition. The modifications should assist with creating SCOs that pass the SCORM conformance test. The modifications are made to files in the Storyline 360 installation directory which allows the files to be automatically applied to published courseware. This method removes the need to modify multiple files in each published PIF. This saves time and decreases the chance of errors due to typos or forgetting to modify a file. **However, because this method modifies the Storyline 360 installation files, it is important that you back up these files before making any of the code modifications shown below.**

## Version Information

This document applies to IMI courseware developed in Storyline 360. However, many (if not all) of the code changes may be directly applicable to previous versions, depending on the variation of installation files.

# Publish Configuration

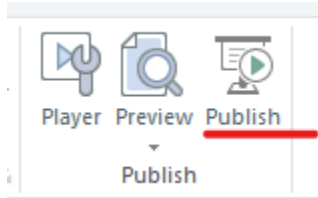
1. Click **“Player”** on the toolbar
2. Click **“Other”**
3. Check **“Launch player in new window”** (creates launch page)



## Important

“Launch player in new window” feature does not work properly in the Storyline 360 Version 3.48.24159.0. Until Storyline fixes this issue in a new release, a workaround is modifying the manifest file after publishing the package:

1. Still check the “Launch player in new window” checkbox and follow all the instructions in this guide.
2. Unzip the published package.
3. Locate the manifest file which is the root folder and its name is imsmanifest.xml.
4. Open the imsmanifest.xml file with a text editor and search for href="index.html" (if you are unable to find a match, then skip Step 5).
5. Replace href="index.html" with href="launcher.html" and save the edit.
6. Zip the unzipped folder.



Click “Publish” in the toolbar.

**Publish window**

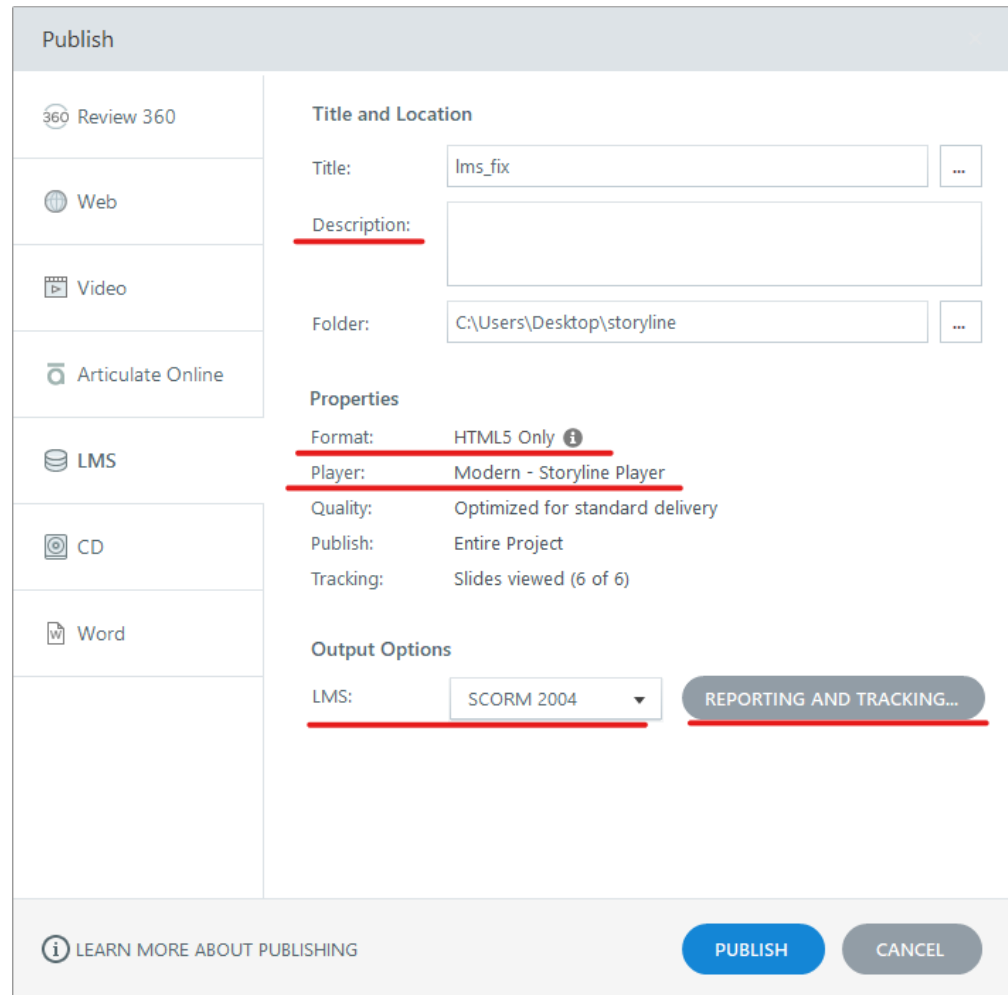
**Description:** Required. An empty Description will be reported as an issue in the SCORM test.

**Format:** HTML5 Only

**Player:** Modern - Storyline Player

**LMS:** SCORM 2004

**REPORTING AND TRACKING...:** Click this button to bring up the “Reporting and Tracking Options” window.



**Reporting and Tracking Options Window**

**LMS:** SCORM 2004

**Edition:** 3rd Edition

**Description:** Description is required. An empty Description will be reported as an issue in the SCORM test.

**Keywords:** Keywords are required. An empty Keywords will be reported as an issue in the SCORM test.

**Tracking:** Click this tab to switch to the LMS tracking setting panel.

Reporting and Tracking Options

Reporting

Tracking

LMS: SCORM 2004 Edition: 3rd Edition

**LMS Course Information**

Title: lms\_fix

Description:

Identifier: 6AEFAxjKMbj\_course\_id

Version: 1 Duration: hh:mm:ss

Keywords:

**LMS Lesson SCORM Information**

Title: lms\_fix

Identifier: test\_lesson

**LMS Reporting**

Report status to LMS as: Passed/Incomplete

LEARN MORE ABOUT REPORTING AND TRACKING

OK CANCEL

**Tracking Panel**

Select one of the three tracking methods to report the course completion.

Reporting and Tracking Options

Reporting

Tracking

You can track progress and completion in three ways:


Track using number of slides viewed

Minimum number of slides viewed to complete:  of 6

Track using quiz result

Result slide to report:

Track using complete course trigger

 LEARN MORE ABOUT REPORTING AND TRACKING

## Code Modifications

Below are the code modifications for Storyline 360 installation files. **Be sure to back up all files before you modify them.** If you don't, you will have to reinstall the software if you want to revert the modifications. Each modification is followed by a note that explains the modification.

C:\Program Files (x86)\Articulate\360\Storyline\Content\lms  
*Scormdriver.js*

For Storyline 360 build before version 3.39.21985.0: *SCORM2004Functions.js*

Original	<pre>function SCORM2004_Finish(strExitType, blnStatusWasSet){     WriteToDebug("In SCORM2004_Finish strExitType=" + strExitType + ", blnStatusWasSet=" +     blnStatusWasSet); var strStatusAfterCompletion;     var blnResult = true;      SCORM2004_ClearErrorInfo()      ;      if ( (strExitType == EXIT_TYPE_FINISH) &amp;&amp; ! blnStatusWasSet ){          WriteToDebug("Getting completion status");          strStatusAfterCompletion =          SCORM2004_GetCompletionStatus();          WriteToDebug("Setting completion status to " + strStatusAfterCompletion);          blnResult = SCORM2004_CallSetValue("cmi.completion_status", strStatusAfterCompletion) &amp;&amp; blnResult;      } }</pre>
----------	--

```
if( strExitType == EXIT_TYPE_SUSPEND && USE_2004_SUSPENDALL_NAVREQ ) {  
    WriteToDebug("Setting adl.nav.request to suspendAll");  
    blnResult = SCORM2004_CallSetValue("adl.nav.request","suspendAll");  
}
```

```
        WriteToDebug("Setting Exit");

        blnResult = SCORM2004_CallSetValue("cmi.exit", SCORM2004_TranslateExitTypeToSCORM(strExitType)) &&
blnResult;

        WriteToDebug("Calling Commit");

        blnResult = SCORM2004_CallCommit() && blnResult;

        WriteToDebug("Calling Finish");

        blnResult = SCORM2004_CallTerminate() && blnResult;

        WriteToDebug("Returning " + blnResult);

        return blnResult;
    }
```



Modified

```
function SCORM2004_Finish(strExitType, blnStatusWasSet){
    WriteToDebug("In SCORM2004_Finish strExitType=" + strExitType + ", blnStatusWasSet=" + blnStatusWasSet);
    var strStatusAfterCompletion;
    var blnResult = true;

    SCORM2004_ClearErrorInfo();

    if ( (strExitType == EXIT_TYPE_FINISH) && ! blnStatusWasSet ){

        WriteToDebug("Getting completion status");

        strStatusAfterCompletion = SCORM2004_GetCompletionStatus();

        WriteToDebug("Setting completion status to " + strStatusAfterCompletion);

        blnResult = SCORM2004_CallSetValue("cmi.completion_status", strStatusAfterCompletion) && blnResult;

    }

    if( strExitType == EXIT_TYPE_SUSPEND && USE_2004_SUSPENDALL_NAVREQ ) {
        WriteToDebug("Setting adl.nav.request to suspendAll");
        blnResult = SCORM2004_CallSetValue("adl.nav.request","suspendAll");
    }

    WriteToDebug("Setting Exit");

    blnResult = SCORM2004_CallSetValue("cmi.exit", SCORM2004_TranslateExitTypeToSCORM(strExitType)) && blnResult;

    WriteToDebug("Setting adl.nav.request to exit");

    blnResult=SCORM2004_CallSetValue("adl.nav.request","exit")&&blnResult;

    WriteToDebug("Calling Commit");

    blnResult = SCORM2004_CallCommit() && blnResult;

    WriteToDebug("Calling Finish");
```

```
    blnResult = SCORM2004_CallTerminate() && blnResult;  
  
    WriteToDebug("Returning " + blnResult);  
  
    return blnResult;  
}
```

**Note**

This code modification adds the missing "**adl.nav.request**" call to the **SCORM2004\_Finish** function. Without the "adl.nav.request" call, the SCO will stay "Not Evaluated" on the ALMS even when it is completed.

C:\Program Files (x86)\Articulate\360\Storyline\Content\scorm\_2004\_3rd  
*imsmanifest.xml*

Original	<pre>&lt;resource identifier="_OUTPUT_TYPE_RES_" type="webcontent" adlcp:scormType="sco" href="index_lms.html"&gt; _LMS_FILELIST_ &lt;/resource&gt;</pre>
Modified	<pre>&lt;resource identifier="_OUTPUT_TYPE_RES_" type="webcontent" adlcp:scormType="sco" href="index_lms.html"&gt;   &lt;dependency identifierref="R_scorm"/&gt; _LMS_FILELIST_ &lt;/resource&gt; &lt;resource identifier="R_scorm" type="webcontent" adlcp:scormType="asset"&gt;   &lt;file href="vocab/strict.xsd"/&gt;   &lt;file href="unique/strict.xsd"/&gt;   &lt;file href="story_content/frame.xml"/&gt;   &lt;file href="extend/strict.xsd"/&gt;   &lt;file href="common/anyElement.xsd"/&gt;   &lt;file href="common/dataTypes.xsd"/&gt;   &lt;file href="common/elementNames.xsd"/&gt;   &lt;file href="common/elementTypes.xsd"/&gt;   &lt;file href="common/rootElement.xsd"/&gt;   &lt;file href="common/vocabTypes.xsd"/&gt;   &lt;file href="common/vocabValues.xsd"/&gt;   &lt;file href="adlcp_v1p3.xsd"/&gt;   &lt;file href="adlnav_v1p3.xsd"/&gt;   &lt;file href="adlseq_v1p3.xsd"/&gt;   &lt;file href="datatypes.dtd"/&gt;   &lt;file href="ims_xml.xsd"/&gt;   &lt;file href="imscp_v1p1.xsd"/&gt;   &lt;file href="imsmanifest.xml"/&gt;   &lt;file href="imsss_v1p0.xsd"/&gt;   &lt;file href="imsss_v1p0auxresource.xsd"/&gt;   &lt;file href="imsss_v1p0control.xsd"/&gt;   &lt;file href="imsss_v1p0delivery.xsd"/&gt;   &lt;file href="imsss_v1p0limit.xsd"/&gt;   &lt;file href="imsss_v1p0objective.xsd"/&gt;   &lt;file href="imsss_v1p0random.xsd"/&gt;   &lt;file href="imsss_v1p0rollup.xsd"/&gt;   &lt;file href="imsss_v1p0seqrule.xsd"/&gt;   &lt;file href="imsss_v1p0util.xsd"/&gt;   &lt;file href="lom.xsd"/&gt;</pre>

	<pre>&lt;file href="xml.xsd"/&gt; &lt;file href="XMLSchema.dtd"/&gt; &lt;/resource&gt;</pre>
<b>Note</b>	This code modification fixes the missing file entries in the <resource> element. The manifest generated by Storyline does not include these files in the <i>Articulate\360\Storyline\Content\scorm_2004_3rd</i> folder. Missing these file entries in the imsmmanifest.xml will result in errors in the SCORM conformance test.

C:\Program Files (x86)\Articulate\360\Storyline\Content\scorm\_2004\_3rd  
*metadata.xml*

<general> ... </general>	
Original	<pre>&lt;identifier&gt;   &lt;catalog&gt;Catalog&lt;/catalog&gt;   &lt;entry&gt;1&lt;/entry&gt; &lt;/identifier&gt;</pre>
Modified	<pre>&lt;identifier&gt;   &lt;catalog&gt;<b>ATIA</b>&lt;/catalog&gt;   &lt;entry&gt;<b>TBD</b>&lt;/entry&gt; &lt;/identifier&gt;</pre>
<b>Note</b>	<p>“ATIA” and “TBD” are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>.            SCOs will fail the SCORM conformance test without this modification.</p>

<metaMetadata> ... </metaMetadata>	
Modified	<pre>&lt;metaMetadata&gt;   &lt;identifier&gt;     &lt;catalog&gt;<b>TBD</b>&lt;/catalog&gt;     &lt;entry&gt;<b>TBD</b>&lt;/entry&gt;   &lt;/identifier&gt;   &lt;metadataSchema&gt;LOMv1.0&lt;/metadataSchema&gt;   &lt;metadataSchema&gt;SCORM_CAM_v1.3&lt;/metadataSchema&gt;   &lt;metadataSchema&gt;<b>ADLv1.0</b>&lt;/metadataSchema&gt;   &lt;language&gt;<b>en</b>&lt;/language&gt; &lt;/metaMetadata&gt;</pre>
<b>Note</b>	<p>The &lt;metaMetadata&gt; element is required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>, but it is not generated correctly by Storyline. You need to add the missing sub-elements to this element.            SCOs will fail the SCORM conformance test without this modification.</p>

<code>&lt;rights&gt; ... &lt;/rights&gt;</code>	
Original	<pre> &lt;rights&gt;   &lt;!--***** 7 *****--&gt;   &lt;cost&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;yes&lt;/value&gt;   &lt;/cost&gt;   &lt;!--***** 8 *****--&gt;   &lt;copyrightAndOtherRestrictions&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;yes&lt;/value&gt;   &lt;/copyrightAndOtherRestrictions&gt; &lt;/rights&gt;                     </pre>
Modification	<pre> &lt;rights&gt;   &lt;!--***** 7 *****--&gt;   &lt;cost&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;no&lt;/value&gt;   &lt;/cost&gt;   &lt;!--***** 8 *****--&gt;   &lt;copyrightAndOtherRestrictions&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;no&lt;/value&gt;   &lt;/copyrightAndOtherRestrictions&gt; &lt;/rights&gt;                     </pre>
<b>Note</b>	<p>The <code>&lt;value&gt;</code> sub-elements of <code>&lt;cost&gt;</code> and <code>&lt;copyrightAndOtherRestrictions&gt;</code> are required to be “no” according to <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. SCOs will fail the SCORM conformance test without this modification.</p>

<code>&lt;classification&gt; ... &lt;/classification&gt;</code>	
<b>Modification</b> <b>IMPORTANT</b> <b>SEE NOTE</b>	<pre> &lt;!-- This description is for the intended MOS and skill level of the student.--&gt;   &lt;classification&gt;     &lt;purpose&gt;       &lt;source&gt;LOMv1.0&lt;/source&gt;       &lt;value&gt;discipline&lt;/value&gt;                     </pre>

```
</purpose>
<description>
  <string language="en-US">Your description</string>
</description>
<keyword>
  <string language="en-US">Your keyword</string>
</keyword>
</classification>

<!-- This description is for the intended SQI of the student. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>discipline</value>
  </purpose>
  <description>
    <string language="en-US">Your description</string>
  </description>
  <keyword>
    <string language="en-US">Your keyword</string>
  </keyword>
</classification>

<!-- This description is for the intended ASI of the student. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>discipline</value>
  </purpose>
  <description>
    <string language="en-US">Your description</string>
  </description>
  <keyword>
    <string language="en-US">Your keyword</string>
  </keyword>
</classification>

<!-- This description is for the task numbers and task descriptions of the critical tasks for which this SCO/organization
provides training or support. -->
<classification>
```

```

<purpose>
  <source>LOMv1.0</source>
  <value>educational objective</value>
</purpose>
<description>
  <string language="en-US">Your description</string>
</description>
<keyword>
  <string language="en-US">Your keyword</string>
</keyword>
</classification>

<!-- This description is for the SCO's learning objective. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>educational objective</value>
  </purpose>

  <!-- ***EDIT THIS*** -->
  <!-- This description is for the SCO's Learning Objective: Action, Condition, and Standard. -->
  <!-- If this is metadata for an organization (course), use the description from <general>. -->
  <description>
    <string language="en-US">Your description</string>
  </description>

  <!-- ***EDIT THIS*** -->
  <!-- This keyword/phrase needs to describe the main topic of the SCO, e.g. "M50 Protective Mask". -->
  <keyword>
    <string language="en-US">Your keyword</string>
  </keyword>
</classification>

<!-- This classification indicates 508 compliance or non-compliance. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>accessibility restrictions</value>
  </purpose>
  <description>

```



	<pre>                 &lt;string language="en-US"&gt;508 Compliant&lt;/string&gt;             &lt;/description&gt;             &lt;keyword&gt;                 &lt;string language="en-US"&gt;508&lt;/string&gt;             &lt;/keyword&gt;             &lt;keyword&gt;                 &lt;string language="en-US"&gt;PL508&lt;/string&gt;             &lt;/keyword&gt;             &lt;keyword&gt;                 &lt;string language="en-US"&gt;accessibility restrictions&lt;/string&gt;             &lt;/keyword&gt;         &lt;/classification&gt;          &lt;!-- This classification is for the foreign disclosure rating. --&gt;         &lt;classification&gt;             &lt;purpose&gt;                 &lt;source&gt;LOMv1.0&lt;/source&gt;                 &lt;value&gt;security level&lt;/value&gt;             &lt;/purpose&gt;             &lt;description&gt;                 &lt;string language="en-US"&gt;FD5&lt;/string&gt;             &lt;/description&gt;             &lt;keyword&gt;                 &lt;string language="en-US"&gt;FD5&lt;/string&gt;             &lt;/keyword&gt;         &lt;/classification&gt;     </pre>
<p><b>Note</b></p>	<p>These &lt;classification&gt; elements are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. You need to append them as the last children of the &lt;lom&gt; element, and replace “<b>Your description</b>” and “<b>Your keyword</b>” with your own information.</p> <p>The comment above each &lt;classification&gt; element briefly explains the element. To learn more about the ALMS requirements for these elements, check <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. SCOs will fail the SCORM conformance test without this modification.</p>

# Lectora Online Code Modifications for ALMS and SCORM Testing

*Last modified: 31-Mar-20*

## Overview

The code modifications in this document are designed to allow Lectora Online projects to roll up successfully in the Army Learning Management System (ALMS) when published for SCORM 2004 3<sup>rd</sup> edition. The modifications should assist with creating SCOs that pass the SCORM conformance test.

## Required Knowledge

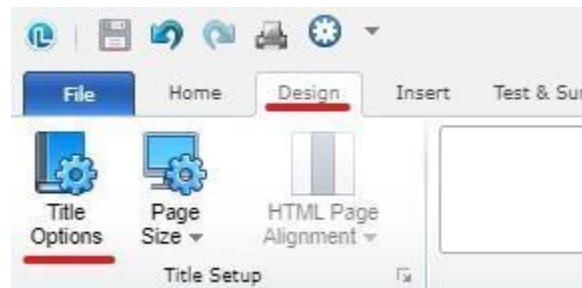
- SCORM 2004 3rd standards
- Settings and Publishing SCORM lessons in Lectora Online
- XML, HTML, JavaScript

## Version Information

The version of Lectora Online is 4.7 at this time. This document will be edited if needed for the future versions of Lectora Online.

## Publish Configuration

1. Click the “**Design**” tab
2. Click “**Title Options**” to open the **Title Option** window



3. Select “**AICC and SCORM for LMS Published Title**”
4. Check the “**Use Web Accessibility Settings**” checkbox if 508 compliant is required for the content

### Title Options



Name:

Sample Title

- Standard Lectora Online Title
- AICC and SCORM for LMS Published Title

Language: English

Enable Dynamic Text Option

This setting will enable the Dynamic Text option on text blocks. The content in a dynamic text block can be updated once published to HTML.

Use Web Accessibility Settings [Accessibility Support](#)

Selecting this option will enable features that can be used when developing content that is Section 508 compliant or follows the Web Content Accessibility Guidelines (WCAG) 2.0. Select a color to use for the visual focus indicator.

Focus Color Width 1

Retain tracking status between sessions

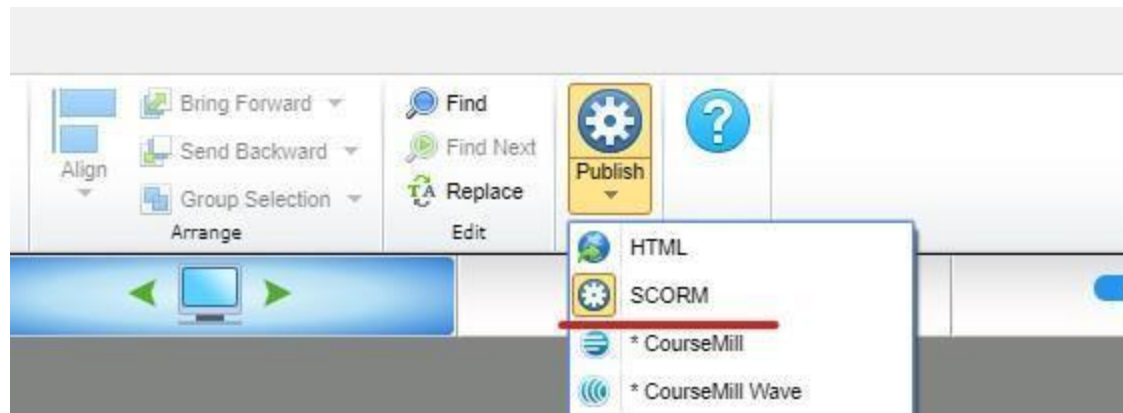
Enable Responsive Title



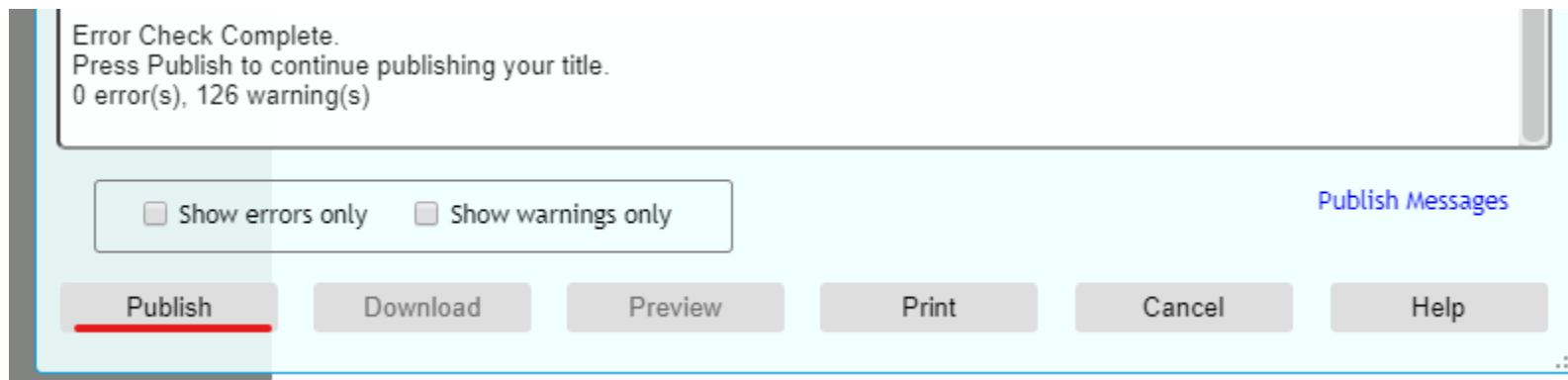
Cancel

OK

5. Click **“Publish”** in the toolbar, then select **“SCORM”** in the dropdown menu



6. Review the validation report then click **“Publish”**



7. Set **“Course Is”** to **“SCORM 2004 Conformant”**
8. Check **“The published course will be presented in a separate window than the LMS”**
9. Check **“The published course will prompt to restore the last viewed location within the LMS”**
10. Check **“The published course will report Test/Survey Question Interactions to the LMS”**

SCORM ✕

SCORM Options HTML Options FTP Options PENS Options

Course Is: SCORM 2004 Conformant ▼

Course Creator:

Course ID:

Course Title:

URL:

Course Description:

Additional Keywords:   
(Comma Separated)

- The published course will be presented in a separate window than the LMS.
- The published course will prompt to restore the last viewed location within the LMS.
- The published course will report Test/Survey Question Interactions to the LMS.
  - Append timestamp to interaction to create unique id

? Cancel OK

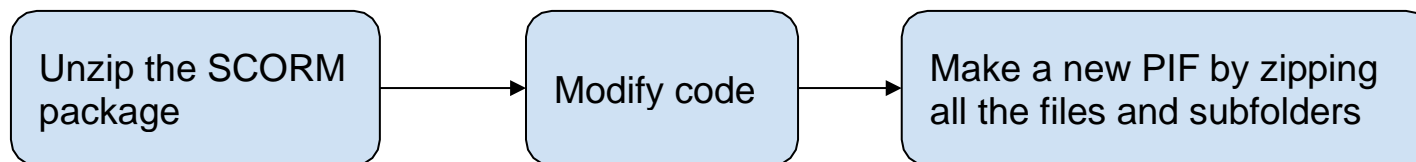
11. Click “**OK**” button once you are satisfied with the other publishing information (e.g., Course Title, Course Description)



12. Click the “**Download**” button to get the SCORM package

## Modification Process

1. Click the “**Download**” button in Lectora's SCORM window to download the SCORM package, a zip file.
2. Unzip the zip file to get the package folder.
3. Follow the “**File modifications**” section below to remove invalid files.
4. Follow the “**Code modifications**” section below to modify the files in the package folder.
5. Select all the files and sub-folder in the package folder, then zip all of them together. (**IMPORTANT:** Do not zip the package folder directly; otherwise you will get an extra folder in your new zip file.)





## File Modifications

Remove these two dtd files from the package:

- **./dtd/IMS\_METADATAv1p1.dtd**
- **./dtd/scormcsf(1.1).dtd**

The above files are outdated and not needed for the SCORM Package. In addition, naming the file “scormcsf(1.1)” violates ALMS Business Rule 2.1.1: Allowable File Name Characters.

## Code Modifications

Below are the code modifications for the files in the Lectora generated SCORM package. Each modification is followed by a note that explains the modification.

*scofunctions2004.js*

Original	<pre>if(window.sabaScorm2004){LMSSetValue("cmi.exit","");LMSSetValue('adl.nav.request','exitAll');}else{LMSSetValue('adl.nav.request','exit');};</pre>
Modified	<pre>if(LMSGetValue("cmi.completion_status")==="completed"){LMSSetValue("cmi.exit","normal");LMSSetValue('adl.nav.request','exitAll');}else{LMSSetValue("cmi.exit","suspend");LMSSetValue('adl.nav.request','suspendAll');};</pre>
<b>Note</b>	This code modification fixes the issue of <b>adl.nav.request</b> call in the doQuit function. Without this modification, the lesson won't report navigation requests, and ALMS won't display the correct status after learners exit the lesson.

*Index.html*

<p>New</p>	<pre> &lt;!DOCTYPE html&gt; &lt;html&gt; &lt;head&gt; &lt;title&gt;Launch&lt;/title&gt; &lt;meta http-equiv="X-UA-Compatible" content="IE=edge" /&gt; &lt;meta charset="utf-8" /&gt;  &lt;script type="text/JavaScript"&gt; var contentWindow function openContentWindow () { contentWindow = window.open( "a001index.html", "_blank", "height=768,width=1024,status=0,toolbar=0,menubar=0,location=0,resizable=1" ) } function closeLaunchWindow () { if (!contentWindow.closed) { contentWindow.close() } } } &lt;/script&gt; &lt;/head&gt; &lt;body onLoad="openContentWindow()" onBeforeUnload="closeLaunchWindow()"&gt; &lt;p&gt;The course is opened in another window.&lt;br&gt; Do not close this window in the middle of the course.&lt;/p&gt; &lt;/body&gt; &lt;/html&gt;                 </pre>
<p>Note</p>	<p>Although Lectora Online provides the option to present the lesson in a new window, the published package does not work as intended on ALMS at the time of the last update of this document. Consequently, the SCORM communication is terminated prematurely if the learner clicks the browser window exit button.</p> <p>To resolve this issue, you need to create a new “index.html” file as the new launch page that pops up a window to open the old launch page “a001index.html”. <b>IMPORTANT:</b> “a001index” is the Lectora’s system default name of the Assignable Unit (AU). If you rename it in Lectora before publishing, you need to use the same name in the “index.html” file.</p> <p>This method complies with the <b>Best Practice: Separate Content Window</b> and <b>Best Practice: Avoid Top-Level Window Closure</b> in the <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3</a>.</p>

*imsmanifest.xml*

<code>&lt;organization&gt;...&lt;/organization&gt;</code>	
New	<code>&lt;metadata&gt; &lt;adlcp:location&gt;metadata.xml&lt;/adlcp:location&gt; &lt;/metadata&gt;</code>
<b>Note</b>	Insert this <code>&lt;metadata&gt;</code> element into the <code>&lt;organization&gt;</code> element. The SCORM validator cannot find the metadata file without this element.

<code>&lt;resources&gt;...&lt;/resources&gt;</code>	
Original	<code>&lt;resources&gt; &lt;resource identifier="A001" type="webcontent" adlcp:scormType="sco" href="a001index.html"&gt; &lt;file href="a001index.html"/&gt;</code>
Modified	<code>&lt;resources&gt; &lt;resource identifier="A001" type="webcontent" adlcp:scormType="sco" href="index.html"&gt; &lt;file href="index.html"/&gt; <b>&lt;dependency identifierref="R_scorm"/&gt;</b></code>
New	<code>&lt;resource identifier="R_scorm" type="webcontent" adlcp:scormType="asset"&gt; &lt;file href="adlcp_v1p3.xsd"/&gt; &lt;file href="adlnav_v1p3.xsd"/&gt; &lt;file href="ims_xml.xsd"/&gt; &lt;file href="imscp_v1p1.xsd"/&gt; &lt;file href="imsmanifest.xml"/&gt; &lt;file href="imsmd_rootv1p2p1.xsd"/&gt; &lt;file href="imsss_v1p0.xsd"/&gt; &lt;file href="imsss_v1p0auxresource.xsd"/&gt; &lt;file href="imsss_v1p0control.xsd"/&gt; &lt;file href="imsss_v1p0delivery.xsd"/&gt; &lt;file href="imsss_v1p0limit.xsd"/&gt; &lt;file href="imsss_v1p0objective.xsd"/&gt; &lt;file href="imsss_v1p0random.xsd"/&gt;</code>

	<pre>&lt;file href="imsss_v1p0rollup.xsd"/&gt; &lt;file href="imsss_v1p0seqrule.xsd"/&gt; &lt;file href="imsss_v1p0util.xsd"/&gt; &lt;file href="launch.html"/&gt; &lt;file href="revlink.xml"/&gt; &lt;/resource&gt;</pre>
<b>Note</b>	<p>This code modification updates two things:</p> <ol style="list-style-type: none"><li>1) It changes the launch page to the new "index.html" file mentioned above;</li><li>2) It adds the missing file entries in the &lt;resource&gt; element. The Lectora generated imsmanifest.xml file does not include these files. Missing these file entries in imsmanifest.xml will fail the SCORM conformance test.</li></ol> <p><b>IMPORTANT:</b> Some files in the "images" folder might not be included in the imsmanifest.xml. If the SCORM validation report indicates package files are missing in the imsmanifest.xml, you will need to add the missing files to the &lt;resource&gt; element.</p>

*metadata.xml*

<code>&lt;general&gt; ... &lt;/general&gt;</code>	
New	<code>&lt;identifier&gt; &lt;catalog&gt;ATIA&lt;/catalog&gt; &lt;entry&gt;TBD&lt;/entry&gt; &lt;/identifier&gt;</code>
<b>Note</b>	“ATIA” and “TBD” are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a> . SCOs will fail the SCORM conformance test without this modification.

<code>&lt;metaMetadata&gt; ... &lt;/metaMetadata&gt;</code>	
Original	<code>&lt;metaMetadata&gt; &lt;metadataSchema&gt;ADL SCORM(TM) 1.2&lt;/metadataSchema&gt; &lt;/metaMetadata&gt;</code>
Modified	<code>&lt;metaMetadata&gt; &lt;identifier&gt; &lt;catalog&gt;TBD&lt;/catalog&gt; &lt;entry&gt;TBD&lt;/entry&gt; &lt;/identifier&gt; &lt;metadataSchema&gt;LOMv1.0&lt;/metadataSchema&gt; &lt;metadataSchema&gt;SCORM_CAM_v1.3&lt;/metadataSchema&gt; &lt;metadataSchema&gt;ADLv1.0&lt;/metadataSchema&gt; &lt;language&gt;en&lt;/language&gt; &lt;/metaMetadata&gt;</code>
<b>Note</b>	The <code>&lt;identifier&gt;</code> , <code>&lt;metadataSchema&gt;</code> , and <code>&lt;language&gt;</code> elements are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a> . SCOs will fail the SCORM conformance test without this modification.

<code>&lt;lom&gt; ... &lt;/lom&gt;</code>
---

<p>Modification <b>IMPORTANT</b> <b>SEE NOTE</b></p>	<pre> &lt;!-- This description is for the intended MOS and skill level of the student.--&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;discipline&lt;/value&gt;   &lt;/purpose&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;   &lt;/keyword&gt; &lt;/classification&gt;  &lt;!-- This description is for the intended SQI of the student. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;discipline&lt;/value&gt;   &lt;/purpose&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;   &lt;/keyword&gt; &lt;/classification&gt;  &lt;!-- This description is for the intended ASI of the student. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;discipline&lt;/value&gt;   &lt;/purpose&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;   &lt;/keyword&gt; </pre>
--	--

<pre> &lt;/classification&gt;  &lt;!-- This description is for the task numbers and task descriptions of the critical tasks for which this SCO/organization provides training or support. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;educational objective&lt;/value&gt;   &lt;/purpose&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;   &lt;/keyword&gt; &lt;/classification&gt;  &lt;!-- This description is for the SCO's learning objective. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;educational objective&lt;/value&gt;   &lt;/purpose&gt;    &lt;!-- ***EDIT THIS*** --&gt;   &lt;!-- This description is for the SCO's Learning Objective: Action, Condition, and Standard. --&gt;   &lt;!-- If this is metadata for an organization (course), use the description from &lt;general&gt;. --&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;    &lt;!-- ***EDIT THIS*** --&gt;   &lt;!-- This keyword/phrase needs to describe the main topic of the SCO, e.g. "M50 Protective Mask". --&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;   &lt;/keyword&gt; &lt;/classification&gt;  &lt;!-- This classification indicates 508 compliance or non-compliance. --&gt; &lt;classification&gt; </pre>
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	<pre> &lt;purpose&gt;   &lt;source&gt;LOMv1.0&lt;/source&gt;   &lt;value&gt;accessibility restrictions&lt;/value&gt; &lt;/purpose&gt; &lt;description&gt;   &lt;string language="en-US"&gt;508 Compliant&lt;/string&gt; &lt;/description&gt; &lt;keyword&gt;   &lt;string language="en-US"&gt;508&lt;/string&gt; &lt;/keyword&gt;   &lt;keyword&gt;   &lt;string language="en-US"&gt;PL508&lt;/string&gt; &lt;/keyword&gt;   &lt;keyword&gt;   &lt;string language="en-US"&gt;accessibility restrictions&lt;/string&gt; &lt;/keyword&gt; &lt;/classification&gt;  &lt;!-- This classification is for the foreign disclosure rating. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;security level&lt;/value&gt;   &lt;/purpose&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;FD5&lt;/string&gt;   &lt;/description&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;FD5&lt;/string&gt;   &lt;/keyword&gt; &lt;/classification&gt; </pre>
<p><b>Note</b></p>	<p>These &lt;classification&gt; elements are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. You need to append them as the last children of the &lt;lom&gt; element, and replace “<b>Your description</b>” and “<b>Your keyword</b>” with your own information.</p> <p>The comment above each &lt;classification&gt; element briefly explains the element. To learn more about the ALMS requirements for these elements, check <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. SCOs will fail the SCORM conformance test without this modification.</p>

# Lectora Publisher Code Modifications for ALMS and SCORM Testing

*Last modified: 4-Apr-20*

## Overview

The code modifications in this document are designed to allow Lectora Publisher projects to roll up successfully in the Army Learning Management System (ALMS) when published for SCORM 2004 3<sup>rd</sup> edition. The modifications should assist with creating SCOs that pass the SCORM conformance test.

## Required Knowledge

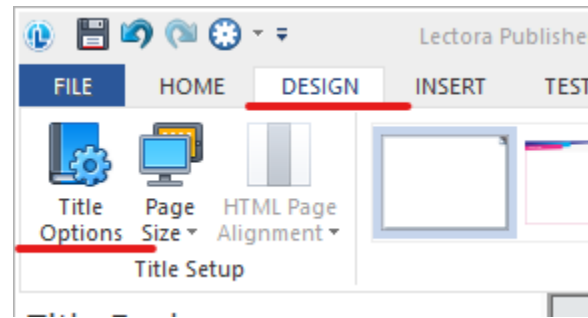
- SCORM 2004 3rd standards
- Settings and Publishing SCORM lessons in Lectora Publisher
- XML, HTML, JavaScript

## Version Information

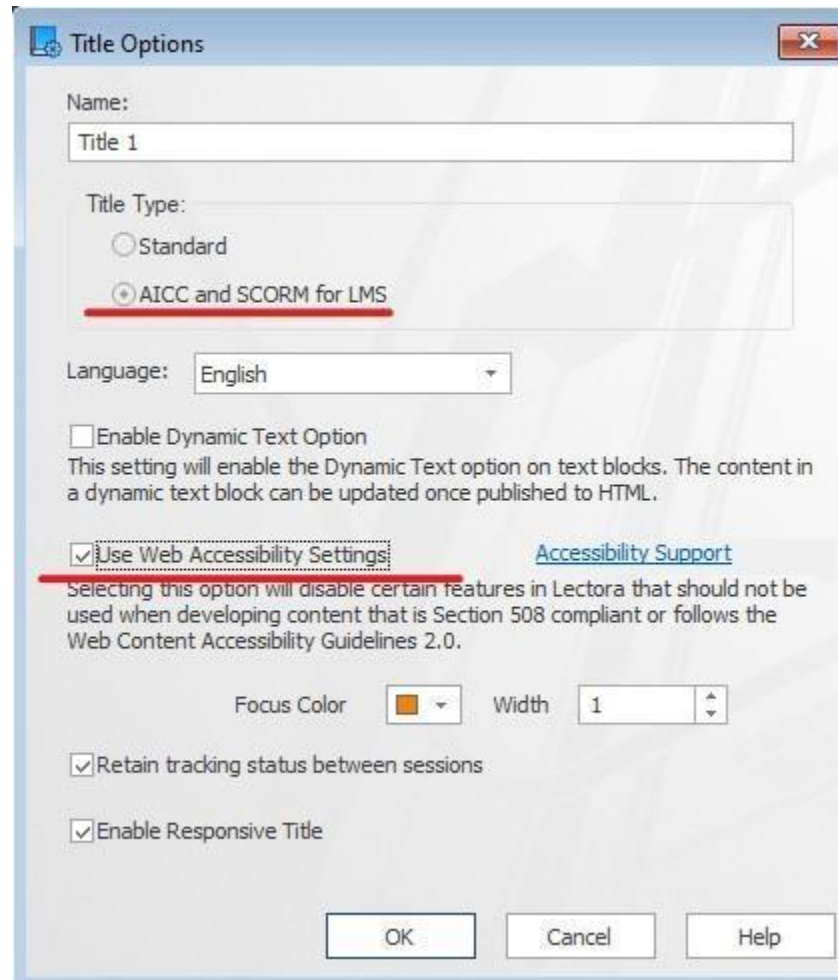
The version of Lectora Publisher is 18.2.3 at this time. This document will be edited if needed for the future versions of Lectora Publisher.

## Publish Configuration

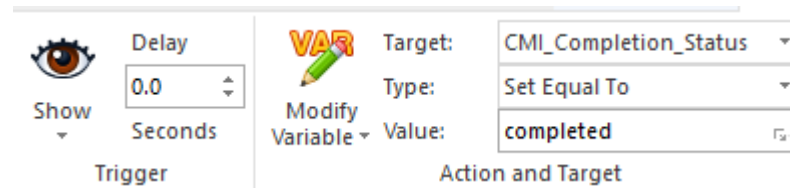
1. Click the “**Design**” tab
2. Click “**Title Options**” to open the **Title Option** window



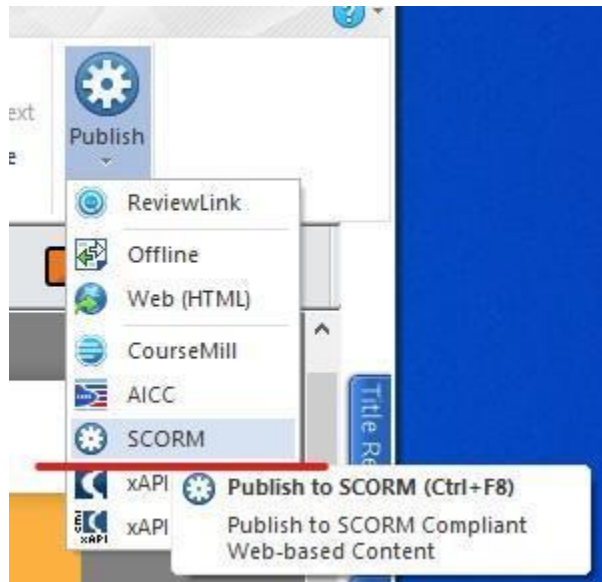
3. Select **"AICC and SCORM for LMS"**
4. Check the **"Use Web Accessibility Settings"** checkbox if 508 compliant is required for the content



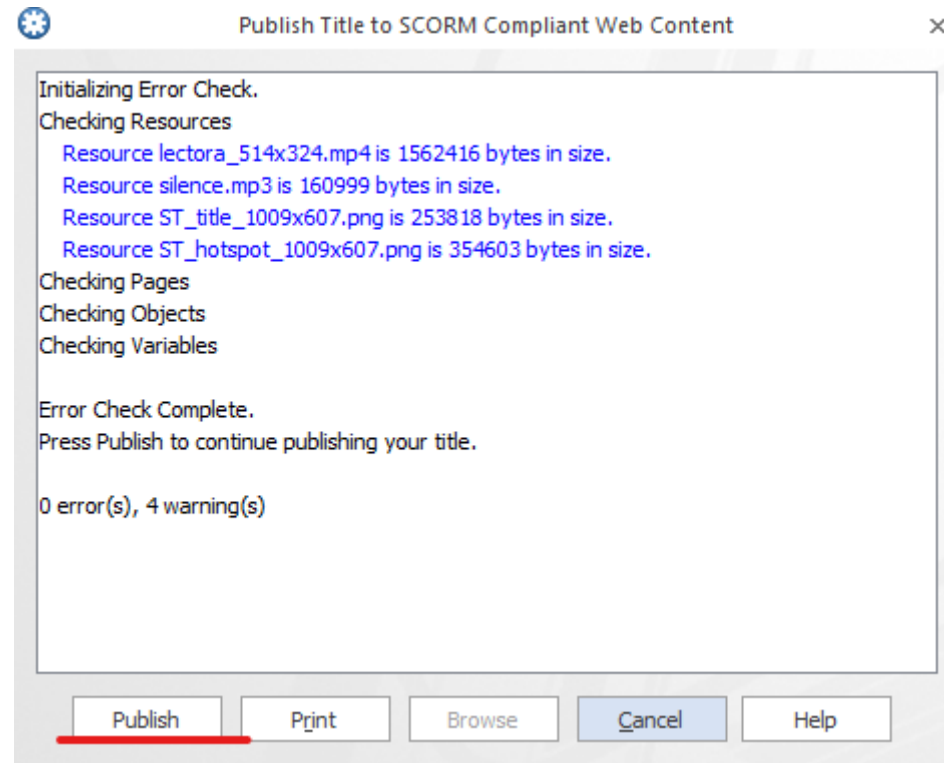
5. Add an **Action** to the page that needs to report completion status as “completed” to LMS. Set the “Trigger” as “Show”, set the “Target” as “CMI\_Completion\_Status”, set the “Type” as “Set Equal To” and set the “Value” as “Completed”.



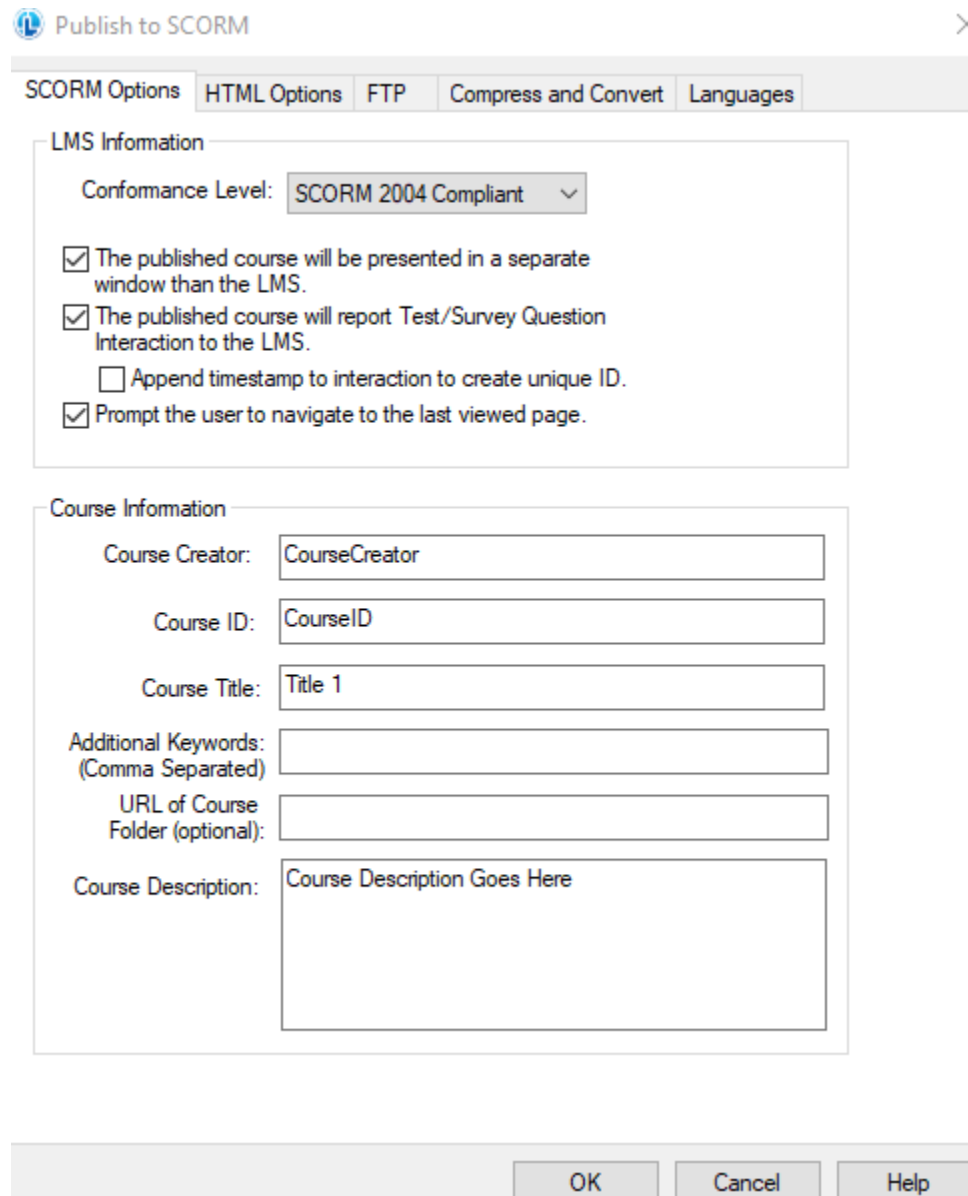
6. Click **“Publish”** in the toolbar, then select **“SCORM”** in the dropdown menu



7. Review the validation report then click **“Publish”**



8. Set “Conformance Level” to “SCORM 2004 Compliant”



The image shows a 'Publish to SCORM' dialog box with a title bar containing a globe icon, the text 'Publish to SCORM', and a close button. Below the title bar are five tabs: 'SCORM Options' (selected), 'HTML Options', 'FTP', 'Compress and Convert', and 'Languages'. The 'SCORM Options' tab is active and contains two sections: 'LMS Information' and 'Course Information'. The 'LMS Information' section has a 'Conformance Level' dropdown menu set to 'SCORM 2004 Compliant' and four checkboxes: 'The published course will be presented in a separate window than the LMS.' (checked), 'The published course will report Test/Survey Question Interaction to the LMS.' (checked), 'Append timestamp to interaction to create unique ID.' (unchecked), and 'Prompt the user to navigate to the last viewed page.' (checked). The 'Course Information' section has several text input fields: 'Course Creator' (filled with 'CourseCreator'), 'Course ID' (filled with 'CourseID'), 'Course Title' (filled with 'Title 1'), 'Additional Keywords: (Comma Separated)', 'URL of Course Folder (optional)', and 'Course Description' (filled with 'Course Description Goes Here'). At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

Publish to SCORM

SCORM Options HTML Options FTP Compress and Convert Languages

LMS Information

Conformance Level: SCORM 2004 Compliant

The published course will be presented in a separate window than the LMS.

The published course will report Test/Survey Question Interaction to the LMS.

Append timestamp to interaction to create unique ID.

Prompt the user to navigate to the last viewed page.

Course Information

Course Creator: CourseCreator

Course ID: CourseID

Course Title: Title 1

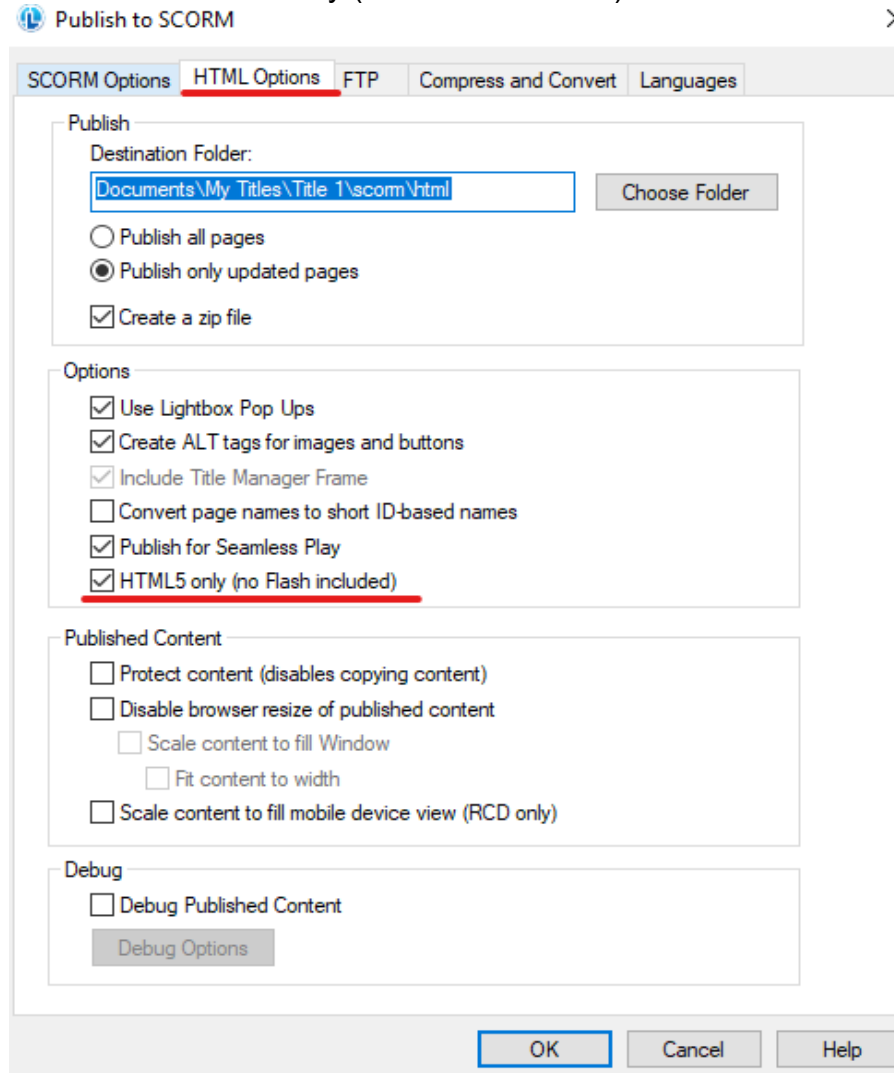
Additional Keywords: (Comma Separated)

URL of Course Folder (optional):

Course Description: Course Description Goes Here

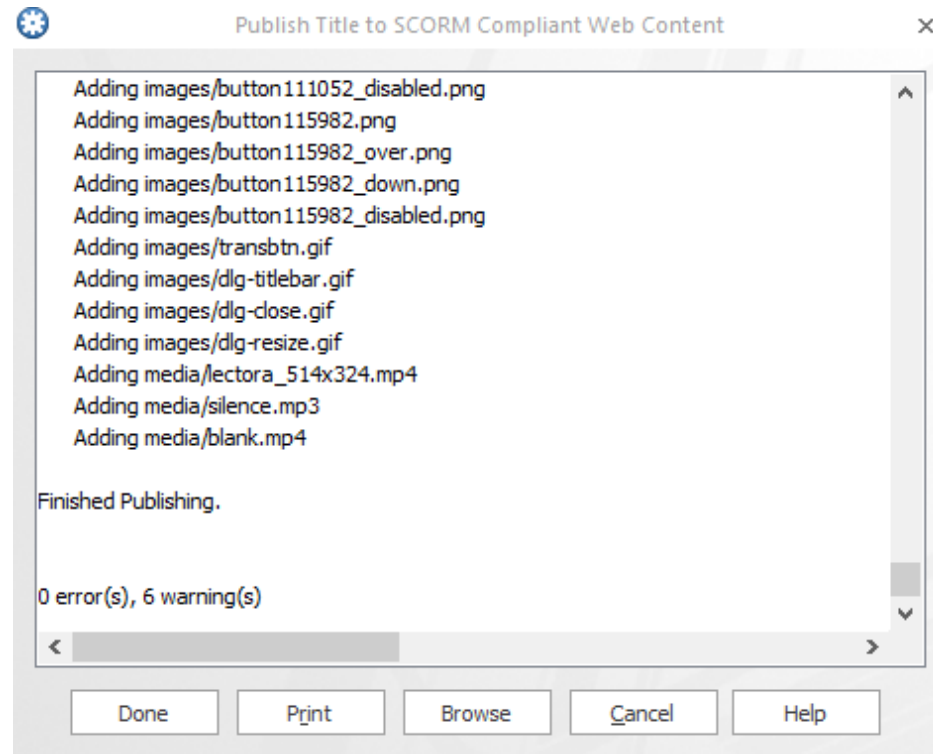
OK Cancel Help

9. Click “**HTML Option**” tab and check “HTML5 only (no Flash included)”



10. Click “**OK**” button once you are satisfied with the other publishing information (e.g., Course Title, Course Description)
11. Click “**Browse**” button to open the publish folder once the publishing process is completed





## Modification Process

1. Open the publish folder.
2. Unzip the zip file to get the package folder.
3. Follow the “**File modifications**” section below to remove invalid files.
4. Follow the “**Code modifications**” section below to modify the files in the package folder.
5. Select all the files and sub-folders in the package folder, then zip all of them together. (**IMPORTANT:** Do not zip the package folder directly; otherwise you will get an extra folder in your new zip file.)



## File Modifications

Remove these two dtd files from the package:

- **./dtd/IMS\_METADATAv1p1.dtd**
- **./dtd/scormcsf(1.1).dtd**

The above files are outdated and not needed for the SCORM Package. In addition, naming the file “scormcsf(1.1)” violates ALMS Business Rule 2.1.1: Allowable File Name Characters.

## Code Modifications

Below are the code modifications for the files in the Lectora generated SCORM package. Each modification is followed by a note that explains the modification.

### *Index.html*

<p>New</p>	<pre> &lt;!DOCTYPE html&gt; &lt;html&gt; &lt;head&gt; &lt;title&gt;Launch&lt;/title&gt; &lt;meta http-equiv="X-UA-Compatible" content="IE=edge" /&gt; &lt;meta charset="utf-8" /&gt;  &lt;script type="text/JavaScript"&gt; var contentWindow function openContentWindow () { contentWindow = window.open( "a001index.html", "_blank", "height=768,width=1024,status=0,toolbar=0,menubar=0,location=0,resizable=1" ) } function closeLaunchWindow () { if (!contentWindow.closed) { contentWindow.close() } } &lt;/script&gt; &lt;/head&gt; &lt;body onLoad="openContentWindow()" onBeforeUnload="closeLaunchWindow()"&gt; &lt;p&gt;The course is opened in another window.&lt;br&gt; Do not close this window in the middle of the course.&lt;/p&gt; &lt;/body&gt; &lt;/html&gt;                 </pre>
<p><b>Note</b></p>	<p>Although Lectora Publisher provides the option to present the lesson in a new window, the published package does not work as intended on the ALMS at the time of the last update of this document. Consequently, the SCORM communication is terminated prematurely if the learner clicks the browser window exit button.</p>

<p>To resolve this issue, you need to create a new “index.html” file as the new launch page that pops up a window to open the old launch page “a001index.html”. <b>IMPORTANT:</b> “a001index” is the Lectora’s system default name of the Assignable Unit (AU). If you rename it in Lectora before publishing, you need to use the same name in the “index.html” file.</p> <p>This method complies with the <b>Best Practice: Separate Content Window</b> and <b>Best Practice: Avoid Top-Level Window Closure</b> in the <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3</a>.</p>
--

*imsmanifest.xml*

<organization>...</organization>	
New	<pre>&lt;metadata&gt;   &lt;adlcp:location&gt;metadata.xml&lt;/adlcp:location&gt; &lt;/metadata&gt;</pre>
<b>Note</b>	<p>Insert this &lt;metadata&gt; element into the &lt;organization&gt; element, between the &lt;item&gt; element and &lt;imsss:sequencing&gt; element. The SCORM validator cannot find the metadata file without this element.</p>

<resources>...</resources>	
Original	<pre>&lt;resources&gt;   &lt;resource identifier="A001" type="webcontent" adlcp:scormType="sco" href="a001index.html"&gt;     &lt;file href="a001index.html"/&gt;   &lt;/resource&gt; &lt;/resources&gt;</pre>
Modified	<pre>&lt;resources&gt;   &lt;resource identifier="A001" type="webcontent" adlcp:scormType="sco" href="index.html"&gt;     &lt;file href="index.html"/&gt;     &lt;file href="a001index.html"/&gt;     &lt;dependency identifierref="R_scorm"/&gt;   &lt;/resource&gt; &lt;/resources&gt;</pre>
New <b>IMPORTANT</b>	<pre>&lt;resource identifier="R_scorm" type="webcontent" adlcp:scormType="asset"&gt;   &lt;file href="missing/files/path/and/name"/&gt; &lt;/resource&gt;</pre>
<b>Note</b>	<p>This code modification updates two things: 1) It changes the launch page to the new “index.html” file mentioned above;</p>

2) It adds a new <resource> element to include any missing file entries in the imsmanifest.xml file. The Lectora generated imsmanifest.xml file does not include all the files in the PIF. Missing file entries in imsmanifest.xml will fail the SCORM conformance test.  
**IMPORTANT:** If the SCORM validation report indicates package files are missing in the imsmanifest.xml, you will need to add the missing files to the new <resource> element.

metadata.xml

<general> ... </general>	
New	<pre>&lt;identifier&gt; &lt;catalog&gt;ATIA&lt;/catalog&gt; &lt;entry&gt;TBD&lt;/entry&gt; &lt;/identifier&gt;</pre>
<b>Note</b>	<p>“ATIA” and “TBD” are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. SCOs will fail the SCORM conformance test without this modification.</p>

<metaMetadata> ... </metaMetadata>	
Original	<pre>&lt;metaMetadata&gt; &lt;metadataSchema&gt;ADL SCORM(TM) 1.2&lt;/metadataSchema&gt; &lt;/metaMetadata&gt;</pre>
Modified	<pre>&lt;metaMetadata&gt; &lt;identifier&gt; &lt;catalog&gt;TBD&lt;/catalog&gt; &lt;entry&gt;TBD&lt;/entry&gt; &lt;/identifier&gt; &lt;metadataSchema&gt;LOMv1.0&lt;/metadataSchema&gt; &lt;metadataSchema&gt;SCORM_CAM_v1.3&lt;/metadataSchema&gt; &lt;metadataSchema&gt;ADLv1.0&lt;/metadataSchema&gt; &lt;language&gt;en&lt;/language&gt; &lt;/metaMetadata&gt;</pre>

<b>Note</b>	The <identifier>, <metadataSchema>, and <language> elements are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a> . SCOs will fail the SCORM conformance test without this modification.
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<code>&lt;lom&gt; ... &lt;/lom&gt;</code>	
Modification <b>IMPORTANT SEE NOTE</b>	<pre> &lt;!-- This description is for the intended MOS and skill level of the student.--&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;discipline&lt;/value&gt;   &lt;/purpose&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;   &lt;/keyword&gt; &lt;/classification&gt;                 </pre>
	<pre> &lt;!-- This description is for the intended SQL of the student. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;discipline&lt;/value&gt;   &lt;/purpose&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;   &lt;/keyword&gt; &lt;/classification&gt;                 </pre>
	<pre> &lt;!-- This description is for the intended ASI of the student. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;                 </pre>

<pre> &lt;value&gt;discipline&lt;/value&gt; &lt;/purpose&gt; &lt;description&gt;   &lt;string language="en-US"&gt;Your description&lt;/string&gt; &lt;/description&gt; &lt;keyword&gt;   &lt;string language="en-US"&gt;Your keyword&lt;/string&gt; &lt;/keyword&gt; &lt;/classification&gt;  &lt;!-- This description is for the task numbers and task descriptions of the critical tasks for which this SCO/organization provides training or support. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;educational objective&lt;/value&gt;   &lt;/purpose&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;   &lt;keyword&gt;     &lt;string language="en-US"&gt;Your keyword&lt;/string&gt;   &lt;/keyword&gt; &lt;/classification&gt;  &lt;!-- This description is for the SCO's learning objective. --&gt; &lt;classification&gt;   &lt;purpose&gt;     &lt;source&gt;LOMv1.0&lt;/source&gt;     &lt;value&gt;educational objective&lt;/value&gt;   &lt;/purpose&gt;    &lt;!-- ***EDIT THIS*** --&gt;   &lt;!-- This description is for the SCO's Learning Objective: Action, Condition, and Standard. --&gt;   &lt;!-- If this is metadata for an organization (course), use the description from &lt;general&gt;. --&gt;   &lt;description&gt;     &lt;string language="en-US"&gt;Your description&lt;/string&gt;   &lt;/description&gt;    &lt;!-- ***EDIT THIS*** --&gt; </pre>
---

```
<!-- This keyword/phrase needs to describe the main topic of the SCO, e.g. "M50 Protective Mask". -->
<keyword>
  <string language="en-US">Your keyword</string>
</keyword>
</classification>

<!-- This classification indicates 508 compliance or non-compliance. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>accessibility restrictions</value>
  </purpose>
  <description>
    <string language="en-US">508 Compliant</string>
  </description>
  <keyword>
    <string language="en-US">508</string>
  </keyword>
  <keyword>
    <string language="en-US">PL508</string>
  </keyword>
  <keyword>
    <string language="en-US">accessibility restrictions</string>
  </keyword>
</classification>

<!-- This classification is for the foreign disclosure rating. -->
<classification>
  <purpose>
    <source>LOMv1.0</source>
    <value>security level</value>
  </purpose>
  <description>
    <string language="en-US">FD5</string>
  </description>
```



	<pre>&lt;keyword&gt;   &lt;string language="en-US"&gt;FD5&lt;/string&gt; &lt;/keyword&gt; &lt;/classification&gt;</pre>
--	---

<b>Note</b>	<p>These &lt;classification&gt; elements are required by <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>. You need to append them as the last children of the &lt;lom&gt; element, and replace “<b>Your description</b>” and “<b>Your keyword</b>” with your own information.</p> <p>The comment above each &lt;classification&gt; element briefly explains the element. To learn more about the ALMS requirements for these elements, check <a href="#">Army BRBP for SCORM 2004 3rd Edition CMI v1.3 Appendices - SCORM 2004 3rd Edition Metadata</a>.</p> <p>SCOs will fail the SCORM conformance test without this modification.</p>
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