



# Implementation Readiness Package v 1.0

## User Guide

Prepared by UCLA/CRESST

12/30/2014

# Table of Contents

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<b>Introduction .....</b>	<b>3</b>
Table 1. IRP Version 1.0 Features .....	3
Table 2. IRP Version 2.x - Planned Features to be released in 2015 .....	4
<b>IRP Usage .....</b>	<b>5</b>
<b>Scoring .....</b>	<b>5</b>
Steps for Implementing IRP Scoring Analysis .....	7
<b>Item Rendering &amp; Interactivity .....</b>	<b>10</b>

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## Introduction

States are responsible for deploying and operating the Smarter Balanced Assessment Delivery System, and in many cases, they will contract for system services. Any platform used to deliver Smarter Balanced assessments should be verified to deliver assessment items with authenticity, score items and tests properly, and deliver assessment results to the Smarter Balanced Data Warehouse according to specifications. To aid with this effort, an Implementation Readiness Package (IRP) is being developed. IRP is a blend of software test harnesses and written specifications that States and their vendors can use to guide and inform their Assessment Delivery System compliance testing.

This document is a user guide to the IRP version 1.0, which as of 12/31/2014 is a preliminary release with limited functionality. Tables 1 and 2 below lists the features contained in IRP version 1.0, as well as what's planned for later versions of IRP to be released starting in early 2015, respectively.

**Table 1. IRP Version 1.0 Features**

IRP Feature	Interface	Functional Requirements Tested
Compliance of test item delivery to the student.	<i>IRP Version 1.0</i> <ul style="list-style-type: none"><li>Manual download of Student Assessment Item Responses from IRP-hosted site</li></ul>	<ol style="list-style-type: none"><li>Correctness of item rendering (display) and associated interaction on screen (NOTE: this is a human visual test)</li><li>Capability to manually input and capture student responses to assessment items</li></ol>
Compliance of delivery of TDS Output file to the Data Warehouse	<i>IRP Version 1.0</i> <ul style="list-style-type: none"><li>Manual upload of TDS Output files to IRP server.</li></ul>	<ol style="list-style-type: none"><li>Capability to score student responses to individual assessment items</li><li>Compliance with TDS Output file XML structure</li><li>Correctness of data:<ul style="list-style-type: none"><li>Student information</li><li>Item scoring (MC and MS item types only)</li></ul></li></ol>

**Table 2. IRP Version 2.x - Planned Features to be released in 2015**

<b>Description</b>	<b>Interface</b>	<b>Functional Requirements Tested</b>
Compliance of test item delivery to the student.	<i>IRP Version 2.X</i> <ul style="list-style-type: none"> <li>Web Service to send requests (as a sample student) for test items, and to receive test item (response).</li> </ul>	<ul style="list-style-type: none"> <li>a. Correctness of item rendering (display) and associated interaction on screen (human visual test)</li> <li>b. Correctness of test/test items delivered to student, given Student Data (provided by the state), Eligibility Requirements, and test data contained in the Test Package</li> <li>c. Capability to receive student responses to assessment items</li> </ul>
Compliance of receipt of Student Registration data, and Student Accommodations data.	<i>IRP Version 2.X</i> <ul style="list-style-type: none"> <li>Web service to deliver Sample Student Data (function will be similar to authentic retrieval of Student Data from State Data System)</li> </ul>	<ul style="list-style-type: none"> <li>a. Receipt verification of School Data, Student Registration data, and Student Accommodations data.</li> </ul>
Compliance of delivery of fully scale scored XML documents to the Data Warehouse	<i>IRP Version 2.X</i> <ul style="list-style-type: none"> <li>Web service to receive TDS Output xml file(s) from Vendor (will simulate API to Data Warehouse)</li> </ul>	<ul style="list-style-type: none"> <li>a. Capability to score student responses to individual assessment items</li> <li>b. Compliance with TDS Output file XML structure</li> <li>c. Correctness of data: <ul style="list-style-type: none"> <li>o Student information</li> <li>o Item scoring</li> <li>o Test Scoring</li> </ul> </li> </ul>
Analysis of Adaptive Engine	<i>IRP Version 2.X</i> <ul style="list-style-type: none"> <li>Web Service to interface with vendor system, involving student responses to assessment items and resulting adaptations.</li> </ul>	<ul style="list-style-type: none"> <li>a. Efficiency and accuracy of vendor adaptive engine analyzed and compared against “gold standard” adaptive engine using known psychometric properties.</li> </ul>

## IRP Usage

### Scoring

The Scoring component of IRP focuses on an Assessment Delivery System's ability to synthesize: a) student data; b) students' responses to assessment items (item scoring); c) test scoring\*; and d) results packaging (for the Data Warehouse).

The overall idea is that a set of *sample students* each complete *one or more tests*, with associated *item responses* that are then processed through the Assessment Delivery System's scoring engine to yield a *Test Score Batching xml file*, suitable for transmission to the Data Warehouse, as specified in the Smarter Balanced document: *Reporting Data Specification Format Test Score Batching*, located at: <http://www.smarterapp.org/documents/DataWarehouse-Spec-ScoreBatching.pdf>.

In this case, though, rather than sending to the Data Warehouse, the vendor will upload the Test Score Batching xml file to a web-based, IRP Test Scoring module, where it will be analyzed for compliance with the following:

- I. Item scoring accuracy\*
- II. Test scoring accuracy\*\*
- III. Completeness and accuracy of student data
- IV. File structure (xml schema and data) for integration with the Data Warehouse

#### NOTES:

\*Item scoring in IRP version 1.0 will only address the item types: MC and MS. The capability to assess other item types will be added in future incremental versions of IRP.

\*\*Test Scoring will not be available in IRP Version 1.0.

Figure 1, below, summarizes the Test Scoring process, and what follows is description of each of the steps listed.

## Implementation Readiness - Process Flow

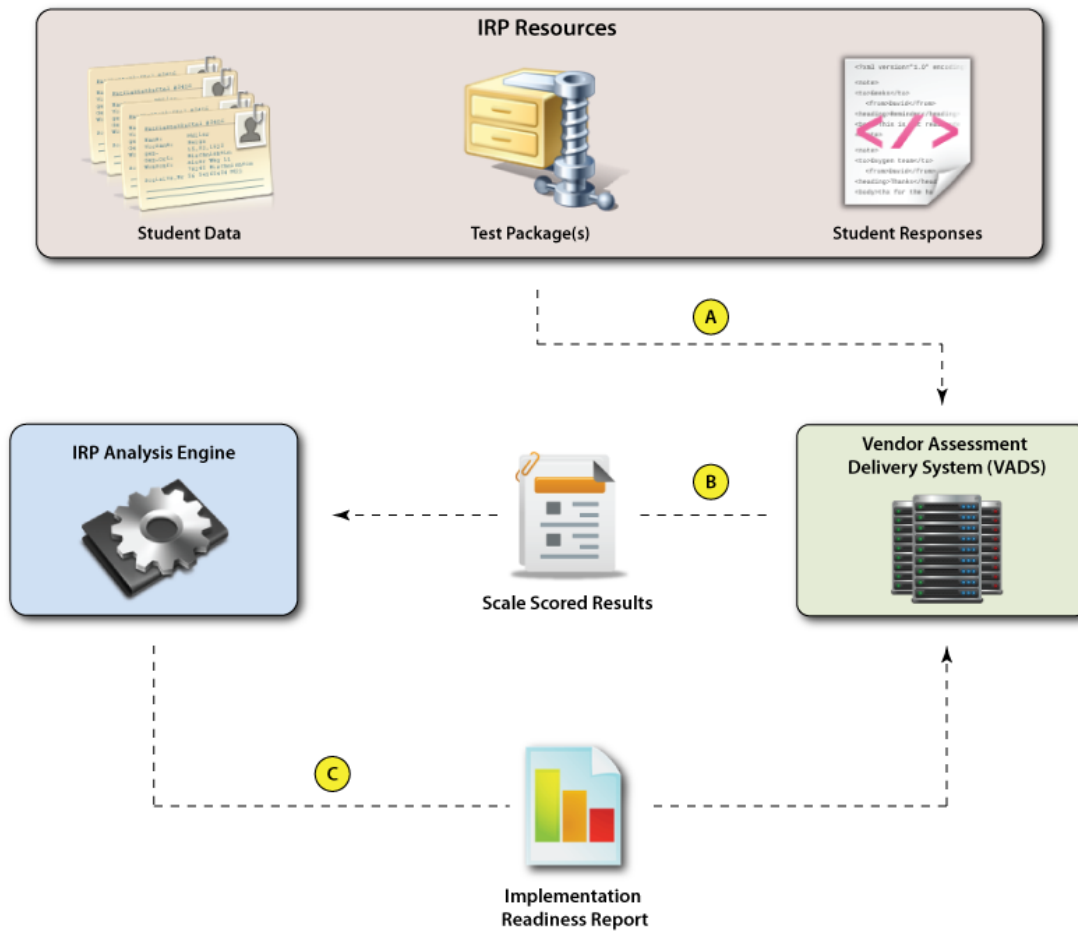


Figure 1: Implementation Readiness – Item & Test Scoring Process Steps

## Steps for Implementing IRP Scoring Analysis

### 1: Download Required Test and Student Data

From the IRP-hosted website (<http://smarterapp.cresst.net>), the vendor will manually download the following:

- Sample student data (3 students)
- 10 grade Math Training Test Package
- Student Assessment Item Responses - each student's responses to each of the assessment items in the test package

To do this, click on the link that says: Download IRP package (Step 1 in the screenshot below).

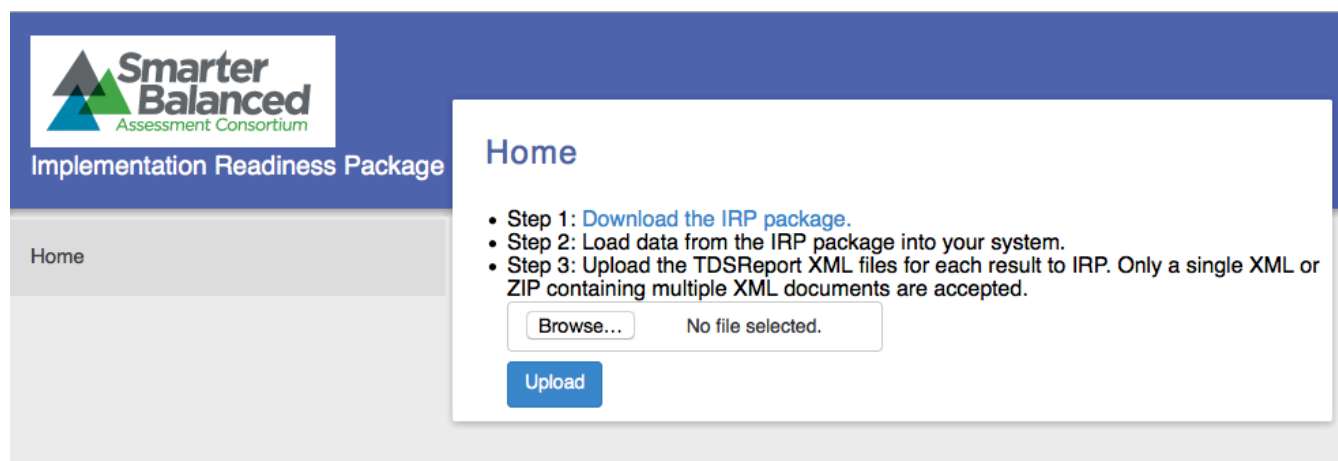


Figure 3. IRP Access Home Page (Download)

### 2: Process Student Data

The sample student data is a .xlsx file that conforms to the information/data fields specified in the Smarter Balanced document: *Administration and Registration Tools User Guide*, Table 16, pages 64-68, which can be found here: [http://www.smarterapp.org/documents/Administration\\_and\\_Registration\\_Tools\\_User\\_Guide.pdf](http://www.smarterapp.org/documents/Administration_and_Registration_Tools_User_Guide.pdf).

The student data file contains a list of sample students to be used in the IRP Scoring analysis. The requirement for vendors is that these virtual students must be integrated into their Assessment Delivery System. Vendors must then complete the following steps:

1. Each student is registered for the test(s) downloaded from the IRP-hosted website.
2. Student Responses and Item Rendering/Interactivity
  - a. *Student Responses*. For each student, his or her assessment item responses are manually entered into the system in exactly the same fashion as if this were an actual student completing the assessment at a remote client site. Each student's responses must match those contained in the .xlsx file of the *Student Item Responses* downloaded from the IRP-hosted website.
  - b. *Item Rendering & Interactivity*. For each of the assessment items contained in the test package, the vendor must manually verify its proper rendering on the device screen, and its proper interactivity, as appropriate (i.e. clickable features, draggable features, text/equation entry, etc.). This is a manual, human-visual task, that verifies compliance based on the requirements spelled out in Implementation Readiness Package document hosted on the SmarterApp.org website

located here: <http://www.smarterapp.org/specs/ImplementationReadinessPackage.html>. See the next section below: *Item Rendering & Interactivity* for a sample worksheet and instructions.

3. The vendor Assessment Delivery System must process each student's item responses through its internal scoring engine, and provide Item Scoring for each student.
4. These results must be captured in a *Test Score Batching* xml file, suitable for transmission to the Data Warehouse. The Test Score Batching xml file will include all of the information required for storage in the Data Warehouse, as spelled out in the Smarter Balanced hosted document: <http://www.smarterapp.org/documents/DataWarehouse-Spec-ScoreBatching.pdf>. (NOTE: Test scoring information is *not* available in IRP v 1.0).
5. Once ready, the Test Score Batching xml file will be manually uploaded to the web-based, IRP Test Scoring module for analysis. To do this, click the Browse button to navigate to your saved Test Score Batching xml file, then click the Upload button to send it to the IRP system for analysis.

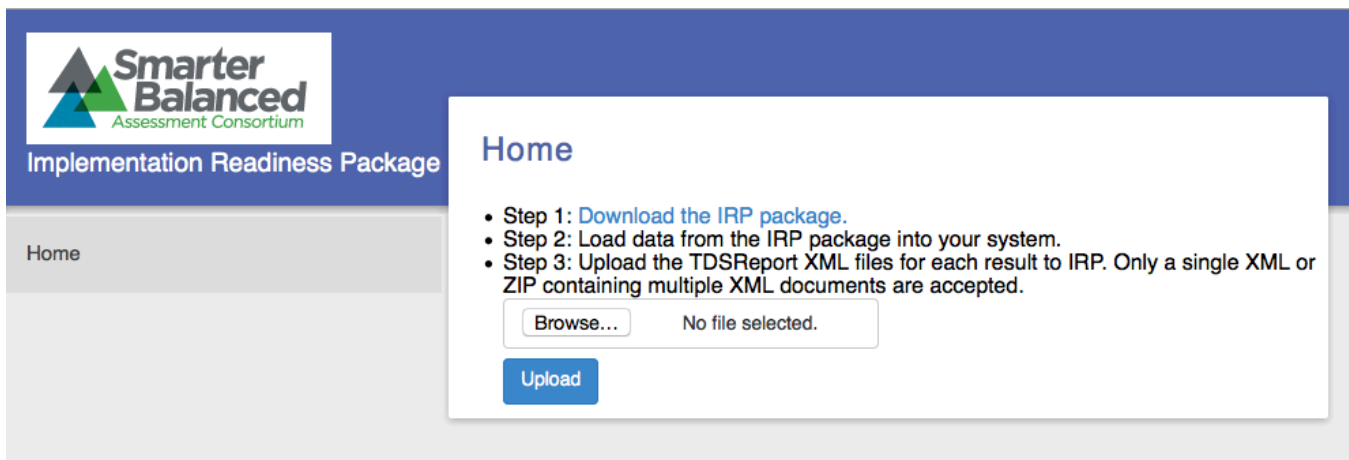


Figure 4. IRP Access Home Page (Upload)

**NOTE:** The IRP does NOT dictate how the vendor accomplishes the above tasks, as each Assessment Delivery System will be different, with different methods and dependencies for integrating and processing students and their test results.

### 3: IRP Analysis

The Test Score Batching xml file will be analyzed by the IRP system for compliance with the following:

1. File format. Is the xml file properly formatted to meet the requirements for integration with the Data Warehouse?
2. Consistency & accuracy of student information. Has the student data been properly preserved, and is all appropriate student data provided (i.e. identifiable vs. de-identifiable information), according to the Data Warehouse requirements specifications?
3. Item Scoring. Was each student's response to each assessment item scored correctly?
4. \*Test Scoring. Has the assessment delivery system properly scored the tests as a whole, according to existing rubrics and weightings?

\*NOTE: Test Scoring, and some of the Student information will not be assessed in IRP version 1.0.

The results of this analysis overall will be displayed on screen to the vendor, as shown below in the example screenshot. They will summarize the Assessment Delivery System's degree of compliance across the categories



listed above (NOTE: Only the first three categories will be addressed in IRP v 1.0). The output will be presented in tabular form (see an example output screen below).

The overall result is displayed in the Status column, as shown.

The screenshot shows the 'Implementation Readiness Package' interface. On the left is a sidebar with 'Home' and 'tdsPCMath11withMath4Examinee.xml'. The main area is titled 'Home' and contains instructions for three steps: downloading the IRP package, loading data, and uploading TDSReport XML files. Below the instructions is a file selection area with a 'Choose File' button and the filename 'tdsPCMath11...aminee.xml', followed by an 'Upload' button. At the bottom, a table shows the upload status.

TDS Report File Name	Status
tdsPCMath11withMath4Examinee.xml	No Errors

Figure 5. Sample IRP Results Screen – Overall Status

To drill down and get a more detailed view of the results, click on the **filename** link on the left of the screen beneath the Home link. An example of what this output screen looks like is shown below.

The screenshot shows the 'Implementation Readiness Package' interface with the file 'tdsPCMath11withMath4Examinee.xml' selected. The main area displays a detailed table of test properties and examinee attributes.

Parameter	Expected Value	Returned Value	Status	Explanation
Test Properties: name		SBAC_PT SBAC-Mathematics-11-Spring-2013-2015	No Errors	PC
Test Properties: subject		MA	No Errors	PC
Test Properties: testid		SBAC-Mathematics-11	Errors Found	PC, Incorrect Value
Test Properties: bankKey		187	No Errors	P
Test Properties: contract		SBAC_PT	No Errors	P
Test Properties: mode		online	No Errors	P
Test Properties: grade		11	Errors Found	PC, Field Empty, Incorrect Data Type, Unacceptable Value
Test Properties: assessmentType			Errors Found	P, Field Empty, Incorrect Data Type, Unacceptable Value
Test Properties: academicYear		2015	No Errors	P
Test Properties: assessmentVersion		5500	Errors Found	PC, Incorrect Value
ExamineeAttribute: name		Birthdate	Errors Found	PC, Incorrect Value
ExamineeAttribute: value		01012000	Errors Found	PC, Incorrect Value
ExamineeAttribute: context		INITIAL	No Errors	P

Figure 6. Sample IRP Results Screen – Detailed Status

## Item Rendering & Interactivity

As part of the IRP download package, there is an Excel document entitled *IRP v1 Module A Form*, which is a worksheet that can be used to verify compliance with item Rendering and Interaction requirements across different devices, operating systems and item types (see requirements spelled out in the Implementation Readiness Package document hosted on the SmarterApp.org website located here:

<http://www.smarterapp.org/specs/ImplementationReadinessPackage.html>.

Below is a sample screenshot of this worksheet. Under the appropriate device type category, fill in the OS tested, the Smarter Balanced Secure Browser version tested, any Accommodations (i.e. American Sign Language, text color/background, text-to-speech, etc.) in place, and the results of the rendering and interaction for each of the item types, according to the rubric listed above the table (reproduced below). In actual use, the vendor must add as many rows as needed under each device type for each of the system combinations tested. This document should be saved as part of your Vendor Assessment Delivery System IRP Compliance results.

**Rubric (enter the appropriate letter, as follows):**

Observed Compliance	Representation in Worksheet	Color of Worksheet Cell
Rendering Compliant	R	Yellow
Interaction Compliant	I	Yellow
Both Rendering and Interaction Compliant	X	Green
Neither Rendering nor Interaction Compliant	[blank]	Red
Not Tested	NT	White

[illegible]

Figure 2. Sample Screenshot of Module A Form Worksheet