



SmarterMeasure
Completed Section Callback (CSC)
Version 1.0

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1. Revision History

Date	Version	Revised By	Description
6/2010	1.0	Jeff Worford	Initial Version

2. Overview

The SmarterMeasure Completed Section Callback (CSC) process provides a method for which assessment results are pushed to an external system in real-time. Using this process prevents the need for external systems to "poll" SmarterMeasure for new data.

CSC can operate in three modes:

- **PerSection** - Push section data to the callback URL each time the user completes a section. This allows the external system to remain in sync with SmarterMeasure.
- **PerAssessment** - Push complete report data to the callback URL when the user has completed the assessment. This will allow for full results to be pushed to the external system, however if the user never fully completes the assessment no data will be pushed.
- **Mixed** - Mixed mode is a combination of both PerSection and PerAssessment modes. If running in this mode, when a user completes a section, a PerSection request will be made to the external system. After the entire assessment is completed, a PerAssessment callback will also be made to the external system. This allows the external system to get the result data in real-time via the PerSection mode but also can leverage the PerAssessment mode once the assessment is completed so any error checking or data clean up can be processed.

3. Security

To secure the data being sent to external systems, SmarterMeasure will only communicate with CSC URLs that accept SSL requests over port 443.

3.1 Validating Requests are coming from SmarterMeasure

It is important that the external system validate that the incoming request is authentic and was sent from SmarterMeasure. To handle this verification, a signature will be sent in the HTTP header of each request that can be used as a means of verification. This signature will be called X-SmarterMeasure-Signature.

The process for which the signature is generated on the SmarterMeasure system is as follows:

1. Concatenation of the full Callback URL (including any query string parameters), RequestTime, and the RequestID. The RequestTime and RequestID can be found as attributes of the XML

element "CompletedSectionCallback". You can see the samples below on how to obtain that from the XML.

2. This concatenation is then signed with HMAC-SHA1 using your SharedSecret as the key and sent in the X-SmarterMeasure-Signature value in the HTTP Header.

The third party system should look for this value in the HTTP Header and re-assemble the string by using the same process. If the two strings match, then the request was authentic.

3.2 Sample HTTP Header Signature

X-SmarterMeasure-Signature: pd3Mj4LlmaCKV0UCcFxlId7C9pE=

4. Structure of Callback

4.1 <CompletedSectionCallback>

XPath: /CompletedSectionCallback

The root node of the callback will be in the element <CompletedSectionCallback>. This element will contain the RequestID and RequestTime attributes that can be used to authenticate the request as described in section 3. The last attribute that is contained in this node is the SectionCode - this is the value for the section that was just completed. If the callback that is being made is for the final results in either PerAssessment or Mixed mode, the SectionCode will contain the value "FullResults". Below are the attributes of the CompletedSectionCallback element.

Attributes

Data	Description	Example
RequestID	The RequestID generated by SmarterMeasure for authentication.	88c1de7c-ab7e-9933-c05b700d91f6015c
RequestTime	The date and time stamp of the request generated by SmarterMeasure.	2010-06-01T01:40:14Z
SectionCode	The value for the section that was just completed. It will be "FullResults" if a PerAssessment request	PersonalInformation
Mode	The date and time stamp for when the user completed the assessment. The value will be blank if the user has not completed the assessment.	PerSection

Sample

```
<?xml version="1.0" encoding="UTF-8" ?>
<CompletedSectionCallback RequestID="88c1de7c-ab7e-9933-c05b700d91f6015c"
    RequestTime="2010-06-01T02:40:14Z"
    SectionCode="PersonalInformation"
```

```

...
Mode="PerSection">
</ CompletedSectionCallback >

```

4.2 <User>

XPath: /CompletedSectionCallback/User

The <User> node will be provided in each and every request that is made to provide the basic information about the user the data is being provided for. The following information is included in the <User> node.

Attributes

Data	Description	Example
InternalID	The internal ID of the user in your system. This ID could be a studentID, UserID, etc. The value of this field will depend on what is asked or what is passed to SmarterMeasure via SSO.	125670992
UserID	Unique code assigned by the SmarterMeasure system to each user.	48711875
DateTimeTaken	The date and time stamp when the user began the assessment.	2010-06-01T01:40:14Z
DateTimeCompleted	The date and time stamp for when the user completed the assessment. The value will be blank if the user has not completed the assessment.	2010-06-01T01:40:14Z
CompletionPercentage	The percentage of the total assessment that has been completed by the user.	25

Sub Nodes

Data	Description	Example
Account	The account name. Attributes: "ID" - The internal ID assigned by SmarterMeasure to the account.	University of Demo ID="123"
AdministrationGroup	The administrative group that the user is grouped in. Attributes: ID – The unique ID assigned by SmarterMeasure for the administrative group Username – The username for the administrative group.	Sample Administrator ID="545" Username="sjones"
TestTakerGroup	The assessment taker group the user is grouped in. Attributes: ID – The unique ID assigned by SmarterMeasure to the test taker group. Username – The login username for the user.	Incoming Students ID-"2548" Username="jstudent"
FirstName	The first name of the user taking the assessment.	John
LastName	The last name of the user taking the assessment.	Doe

EmailAddress	The email address of the user taking the assessment.	jdoe@smartermeasure.com
---------------------	--	-------------------------

Sample

```
<User InternalID="1" UserID="111" DateTimeTaken="2010-06-01T01:40:14Z"
      DateTimeCompleted="2010-06-01T02:40:14Z"
      CompletionPercentage="25">
  <Account ID="11">University of Demo</Account>
  <AdministrationGroup ID="545" Username="sjones">Sample Administrator</AdministrationGroup>
  <TestTakerGroup ID="2548" Username="istudent">Incoming Students</TestTakerGroup>
  <FirstName>John</FirstName>
  <LastName>Doe</LastName>
  <EmailAddress>jdoe@smartermeasure.com</EmailAddress>
  ...
</User>
```

4.3 <DemographicData>

XPath: /CompletedSectionCallback/User/DemographicData

The <DemographicData> will be only provided after the user completes the PersonalInformation section of the assessment or when the PerAssessment mode callback is sent.

Sub Node

Data	Description	Example
Gender	The gender of the user	F
AgeRange	The age range the user is in.	24 - 29
Ethnicity	The ethnicity of the user	African-American
HowManyCourses	How many courses the user has taken.	5

Sample

```
<DemographicData>
  <Gender>F</Gender>
  <AgeRange>24-29</AgeRange>
  <Ethnicity>African-American</Ethnicity>
  <HowManyCourses>6</HowManyCourses>
</DemographicData>
```

4.4 <AccountRequestedData>

XPath: /CompletedSectionCallback/User/AccountRequestedData

The <AccountRequestedData> node will only be provided after the user completes the Personal Information section of the assessment. This is the node that will contain sub-elements for each of the custom questions that were asked on the Personal Information screen.

This node is simply a wrapper for the requested items; see the next section for details.

4.5 <RequestedItem>

XPath: /CompletedSectionCallback/User/AccountRequestedData/RequestedItem

The <RequestedItem> will contain the responses for each custom question that is asked on the Personal Information page. The following Items will be included for each question.

Attributes

Data	Description	Example
QuestionID	The unique QuestionID assigned by SmarterMeasure.	4266
Question	The text of the custom question.	What is your birthday?
Answer	The individual user's response to the question.	2010-02-14

Sample

```
<AccountRequestedData>
  <RequestedItem QuestionID="6" Question="What is your birthday?"
    Answer="2010-02-14" />
</AccountRequestedData>
```

4.5 AssessmentResults

XPath: /CompletedSectionCallback/User/AssessmentResults

The <AssessmentResults> node is the wrapper node for the actual results of the current section that was completed; if running in PerSection mode. If the CSC is running in PerAssessment mode, the children of this node would include all the sections that the user completed.

4.6 <Section>

XPath: /CompletedSectionCallback/User/AssessmentResults/Section

The <Section> node contains all the general scoring information for the section.

Attributes

Data	Description	Example
Percent	The score given to the user out of 100%. Applies to all sections except Typing.	88
Primary	The learning style achieved by a user. Multiple styles are separated by a comma. Applies to Learning Styles only.	Aural,Social
Readiness	Pass, Fail, or Questionable. This value is determined by the Readiness ranges in the account setup.	pass
VersionName	The version of the scale ... 12K, Higher Ed, etc...	HighEd
WPM	The number of word typed (Typing) or read (Reading). Applies to Reading and Typing sections only.	204

Sample

```
<Section Code="LearningStyles" Percent="88" Primary="Aural" Readiness="pass">
...
</Section>
```

4.7 <ExtendedData>

XPath: /CompletedSectionCallback/User/AssessmentResults/Section/ExtendedData

The <ExtendedData> node is the wrapper for all the detailed data for its parent section.

4.8 <SubScales>

XPath: /CompletedSectionCallback/User/AssessmentResults/Section/ExtendedData/Subscales

The <SubScales> node contains the detailed scoring data for each sections subscale data.

4.9 <SubScale>

XPath:

/CompletedSectionCallback/User/AssessmentResults/Section/ExtendedData/Subscales/SubScale

Each <SubScale> node will contain a series of attributes as shown in the table and sample below.

Attributes

Data	Description	Example
ID	The subscale ID assigned by SmarterMeasure	244
Title	The title of the subscale.	Time Management
PointsPossible	The total amount of points possible for this scale	4
PointsAccumulated	The amount of points accumulated by the user	2
VersionName	The version of the subscale... 12K, Higher Education, etc...	HighEd

Sample

```
<SubScales>
  <SubScale ID="1" Title="Aural" PointsPossible="10" PointsAccumulated="10" VersionName="HighEd" />
  <SubScale ID="2" Title="Logical" PointsPossible="10" PointsAccumulated="8" VersionName="HighEd" />
</SubScales>
```



```

<SubScale ID="3" Title="Social" PointsPossible="10" PointsAccumulated="8" VersionName="HighEd" />
<SubSale ID="4" Title="Solitary" PointsPossible="10" PointsAccumulated="5" VersionName="HighEd" />
<SubScale ID="5" Title="Verbal" PointsPossible="10" PointsAccumulated="3" VersionName="HighEd" />
<SubScale ID="6" Title="Physical" PointsPossible="10" PointsAccumulated="2" VersionName="HighEd" />
<SubScale ID="7" Title="Visual" PointsPossible="10" PointsAccumulated="2" VersionName="HighEd" />
<SubScales>

```

4.10 Full Sample CSC Callback

```

<?xml version="1.0" encoding="UTF-8"?>
<CompletedSectionCallback RequestID="88c1de7c-ab7e-9933-c05b700d91f6015c"
    RequestTime="2010-06-01T02:40:14Z"
    SectionCode="PersonalInformation"
    Mode="PerSection">
  <User InternalID="1" UserID="111" DateTimeTaken="2010-06-01T01:40:14Z"
    DateTimeCompleted="2010-06-01T02:40:14Z"
    CompletionPercentage="25">
    <Account ID="11">University of Demo</Account>
    <AdministrationGroup ID="545" Username="sjones">Administrator</AdministrationGroup>
    <TestTakerGroup ID="2548" Username="istudents">Incoming Students</TestTakerGroup>
    <FirstName>John</FirstName>
    <LastName>Doe</LastName>
    <EmailAddress>jdoe@smartermeasure.com</EmailAddress>
    <DemographicData>
      <Gender>F</Gender>
      <AgeRange>24-29</AgeRange>
      <Ethnicity>African-American</Ethnicity>
      <HowManyCourses>6</HowManyCourses>
    </DemographicData>
    <AccountRequestedData>
      <RequestedItem QuestionID="6" Question="What is your birthday?"
        Answer="2010-02-14"></RequestedItem>
    </AccountRequestedData>
    <AssessmentResults>
      <Section Code="LearningStyles" Percent="88" Primary="Aural" Readiness="pass"
        VersionName="HighEd">
        <ExtendedData>
          <SubScales>
            <SubScale ID="1" Title="Aural"
              PointsPossible="10"
              PointsAccumulated="10" />
            <SubScale ID="2" Title="Logical"
              PointsPossible="10"
              PointsAccumulated="10" />
            <SubScale ID="3" Title="Social"

```

```
PointsPossible="10"
PointsAccumulated="10" />
<SubScale ID="4" Title="Solitary"
PointsPossible="10"
PointsAccumulated="10" />

<SubScale ID="5" Title="Verbal"
PointsPossible="10"
PointsAccumulated="10" />
<SubScale ID="6" Title="Physical"
PointsPossible="10"
PointsAccumulated="10" />
<SubScale ID="7" Title="Visual"
PointsPossible="10"
PointsAccumulated="10" />
</SubScales>
</ExtendedData>
</Section>
</AssessmentResults>
</User>
</CompletedSectionCallback>
```

5. Callback Response

The SmarterMeasure system will simply look for an HTTP response of 200. If a response of 200 was received SmarterMeasure assumes that the request was properly handled by the external system. If however, a request of anything other than 200 is returned, SmarterMeasure will add the failed request to a queue for later sending. The next request that is successfully sent to the external system will then trigger the queue to send all the queued requests. However, if a request remains in the queue for more than 15 minutes, it will be marked as failed and an email will be fired to notify the technical team there have been issues.