



Vant4ge Evolve and LMS Integration Technical Interface Specification

(for use in secure facility locations)

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1.0 Change Control and Definitions

1.1 Document History

Version	Date	Reason
0.1	July 31, 2018	Initial version specifying design the initial MVP 1 for demonstration purposes.
0.2	8/7/2018	Added clarification on BookingID by creating Assumption A005
0.3	9/5/2018	Reworked all Status Codes. Reformatted Titles, Parameters, and Responses. Added section 14 to start a conversation on deep linking into LMS as an application. Expanded use of authorization headers to include our work with TBI and STS.
0.4	1/23/2019	Remove references to specific organizations. Remove 4.0 and re-number the document. Change status codes. Generalize document.
1.0	2/1/2021	Update for generic implementation, remove unneeded endpoints, clean up document
1.0.1	3/16/2021	Minor refinements for distribution to vendors interested in integration capabilities

1.2 Terms and Acronyms

The following is a document glossary that identifies the definitions for terms applicable to this document.

Term	Description
VPT	Vant4gePoint Solution
DOC	Department of Corrections (usually for a state)
Subject	In context of a correctional space, also known as the offender
SOR	System of Record. Typically, this is a DOC's information system that houses the states users and subjects
Evolve	Vant4ge mobile solution

2.0 Introduction

This document is the Technical Interface Specification (TIS) describing integration and use of Vant4ge Evolve, Vant4gePoint (VPT), and a Vendors LMS platform in a secure tablet environment by a subject using a tablet in a secured facility. It describes the processes and data elements involved in the exchange of messages between the Vant4gePoint (VPT), Vant4ge Evolve on a vendor tablet, and a vendor's LMS system.

3.0 REST API Authentication Used

The VPT and Evolve applications will rely on remote LMS applications communicating over industry standard REST API calls. The efforts and use of these calls will be shared responsibility between the LMS provider and Vant4ge in that there are endpoints that must be established by both parties' applications.

In the implementation of the APIs, we will expect the following:

1. The API solution implements SSL, and all calls utilizing the solution are sent over HTTPS.
2. The content type in the headers must be set appropriately:
Content-Type: application/json
3. All API requests will contain an authentication method in the header (as defined below)

3.1 HTTP Authorization Header

HTTP Basic Authorization uses the HTTP 1.1 Authorization header. The Authorization header utilizes an authentication method specifier and a payload. For basic authentication the method is always "Basic" and the payload is a base64 encoded string of the username value and password value separated by a colon (:). Vant4ge Point and the calling entity have shared an account id and password to be validated.

Example Authorization Header

```
Authorization: Basic QWxhZGRpbjpPcGVuU2VzYW1l
```

Basic Auth is the basic method where you provide us with both an Application ID (or Vendor ID) and a Shared Secret. The senders would add both of these values (separated by a colon) to the Authorization header, i.e. 'APPIDxxxxx:PWxxxxx' and then base64encode them. (Base64Encoding is really just a standard that is used to encode non-http characters that might be found in passwords.)

Justification for using authorization headers is three-fold:

1. It brings another level of complexity in security to ensure our ability to service various organizations access to data. Each organization we integrate with is given a unique key to include in the headers of communication. This gives us an ability to restrict access by terminating or changing a key should a security event occur in an external organization.
2. The key acts as an identifier that we use to uniquely track an organization's use of our data and a means for us to access their data for audit purposes (our system must abide by CJIS audit capabilities to show when, from what system, and at what time data was accessed). Although not deemed CJIS, our activities with LMS integration should still be treated with similar controls in place.

5.0 Check Subject Exists

Before the LMS Enrollment Agent (8.0) enrolls a subject, it will first check to see if the subject exists in the LMS.

User Acceptance Criteria

The webservice of the LMS queried will respond with a success or appropriate status indicating a failure.

Technical Acceptance Criteria

- VPT will initiate a REST GET call by the BookingID
- LMS API will return a HTTP Status Code and possibly a JSON body depending on the result

Architecture Component: INT_02

5.1 Endpoint Definition

Env	LMS – To be called by Vant4ge
Title	Student Exists
URL	BASE URL/API/Student/{bookingID}/Exists
Method	GET

5.2 URL Parameters

Variable	Type	Required	Description
bookingID	string	Y	Unique ID of a person as identified by the acting jurisdiction.

5.3 Success Response Variables

Variable	Type	Description
bookingID	string	bookingID will be echoed back
firstName	String	First name kept in LMS
lastName	String	Last name kept in LMS

birthDate	String	DOB kept in the LMS to help in identification "YYYY-MM-DD"
userID	String	ID used to represent the student in LMS

5.4 Body Response Code

HTTP Status Code	JSON Body Returned	Description	Example
200	Y	Success	{ bookingID: "yyy", firstName: "yyy", lastName: "yyy", dob: "YYYY-MM-DD", userID: "yyy" }
204	Y	Condition: BookingID failed lookup.	
401	Y	Unauthorized	
500	N	Unspecified server error has occurred	{ errorMessage: "..."} NOTE: Error TBD by each developing platform if an exception can be caught and returned to calling agent.

6.0 Create Subject as a Student

A subject must be created in the provider’s LMS before a program course can be assigned.

User Acceptance Criteria

The webservice of the LMS queried will respond with a success or appropriate status indicating a failure.

Technical Acceptance Criteria

- VPT will initiate a HTTP POST with a JSON packet containing the BookingID, subject’s first name, subject’s last name, subject’s date of birth.
 - {"bookingID": "123R45", "firstName": "John", "lastName": "Doe", "birthDate": "1975-04-25"}
- LMS API will return a HTTP Status Code and possibly a JSON body depending on the result.

Architecture Component: INT_03

6.1 Endpoint Definition

Env	LMS – To be called by Vant4ge
Title	Student Add
URL	BASE URL/API/Student/Add
Method	PUT

6.2 POST Parameters

Variable	Type	Required	Description
bookingID	String	Y	Unique ID of a person as identified by the acting jurisdiction.
firstName	String	Y	First name of the subject
lastName	String	Y	Last name of the subject
birthDate	String	Y	Date in the format of YYYY-MM-DD

6.3 Success Response Variables

Variable	Type	Description
userID	String	New ID for the student created in the LMS

6.4 Body Response Code

HTTP Status Code	JSON Body Returned	Description	Example
200	Y	Success	{ userID: "xxxx" }
400	Y	Condition: Duplicate entry attempted	{ errorMessage: "A student with the same properties already exists" }
401	Y	Unauthorized	
500	N	An error occurred please contact us	{ errorMessage: "..." } NOTE: Error TBD by each developing platform if an exception can be caught and returned to calling agent.

7.0 Enroll Subject in a Course

When a Program administrator assigns a program to an offender in Vant4gePoint or approves a recommended program that includes course work at the site the offender is currently in, an enroll message will be generated in Vant4gePoint and registered in the LMS Enrollment Agent (8.0). The software agent will connect to the LMS web service to enroll a student.

User Acceptance Criteria

The webservice of the LMS queried will respond with a success or appropriate status indicating a failure.

Technical Acceptance Criteria

- VPT will initiate a HTTP POST with a JSON packet containing the LMS userID and courseID
 - {"userID": "123R45", "courseID": "thinking-123"}
- LMS API will return a HTTP Status Code and possibly a JSON body depending on the result
 - Success will return HTTP Status Code 200 and no JSON body
 - Subject not found will return HTTP Status Code 250
 - Course not found will return HTTP Status Code 250
 - {"errorMessage": "An error has occurred" }

Architecture Component: INT_04

7.1 Endpoint Definition

Env	LMS – To be called by Vant4ge
Title	Course Enroll
URL	BASE URL/API/Course/Enroll
Method	PUT

7.2 POST Parameters

Variable	Type	Required	Description
userID	String	Y	ID used to represent the student in the LMS
courseID	String	Y	Course as identified by LMS

7.3 Success Response Variables

Variable	Type	Description
status	String	Status of course enrolled

7.4 Body Response Code

HTTP Status Code	JSON Body Returned	Description	Example
200	Y	Success	
204	Y	Condition: Student not found in LMS.	
204	Y	Condition: Course not found in LMS.	
255	Y	Duplicate entry attempted	{ errorMessage: "A student with the same properties already exists in the course"}
401	Y	Unauthorized	
500	N	An error occurred please contact us	{ errorMessage: "..."} NOTE: Error TBD by each developing platform if an exception can be caught and returned to calling agent.

8.0 Get Student's Enrollment

A case manager in Vant4gePoint will look at an active program. On opening a subject's course a web service request will be made to the LMS at the site the subject is currently assigned to (both current and completed)

Technical Acceptance Criteria

- VPT will initiate a HTTP POST with a JSON packet containing the LMS User ID
 - { "userID" : "123R45" }
- LMS API will return a HTTP Status Code and possibly a JSON body depending on the result
 - Success will return HTTP Status Code 200 and a JSON object of Courses
- Subject not found will return HTTP Status Code 204 and no JSON body
 - Errors will return HTTP Status Code 500 and a JSON body with a property of errorMessage set to a user safe error message
 - { "errorMessage" : "An error has occurred" }

8.1 Endpoint Definition

Env	LMS – To be called by Vant4ge
URL	BASE URL/API/Student/{userID}/Enrolled
Method	GET

8.2 Input

Variable	Type	Required	Description
userID	String	Y	ID used to represent the student in the LMS

8.3 Success Response

Variable	Type	Description
userID	string	ID used to represent the student in the LMS
enrolledCourses	List	List of EnrolledCourse Objects

8.3.1 Enrolled Course Object

Variable	Type	Description
courseID	string	LMS Identifier for the course enrolled in
courseTitle	String	Title of course enrolled in
enrolledOn	String	Date in format YYYY-MM-DD that the course was enrolled on
completedOn	String	Date in format YYYY-MM-DD that the course was completed on in the LMS. Leave empty if not completed

8.4 Body Response Code

HTTP Status Code	JSON Body Returned	Description	Example
200	Y	Success	See embedded image in technical acceptance
204	Y	Student not found in LMS	
401	Y	Unauthorized	
500	N	An error occurred please contact us	{ errorMessage: "..."} NOTE: Error TBD by each developing platform if an exception can be

			caught and returned to calling agent.
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10.0 Get Courses

Ability for a System Admin of the Vant4ge Platform to get a complete list of courses available in an LMS

Technical Acceptance Criteria

- An Authorization Header will be sent to the request URL which the LMS API will return a HTTP Status Code and

```
{
  "siteID": "1234a",
  "courses": [
    {
      "courseID": "23452",
      "courseTitle": "Thinking for a Change",
      "courseDescription": "...DESCRIPTION...",
      "courseAvailableDate": "2017-05-23"
    }
  ]
}
```

- Error states expected are 401 and 500
 - Errors will return HTTP Status Code 500 and a JSON body with a property of errorMessage set to a user safe error message
 - { "errorMessage" : "An error has occurred" }

10.1 Endpoint Definition

Env	LMS – To be called by Vant4ge
URL	BASE URL/API/Courses
Method	GET

10.2 Success Response

Variable	Type	Description
siteID	string	SiteID of LMS returning courses (FacilityID in Vant4gePoint)
courses	List	List of Course Objects

10.2.1 Course Object

Variable	Type	Description
courseID	string	LMS Identifier for the course enrolled in
courseTitle	String	Title of course enrolled in
courseDescription	String	Complete Abstract of Course
courseAvailableDate	String	Date in format YYYY-MM-DD of when the course was made available to students in the LMS

10.3 Body Response Code

HTTP Status Code	JSON Body Returned	Description	Example
200	Y	Success	{ ... } See Technical Acceptance Criteria for example
401	Y	Unauthorized	
500	N	An error occurred please contact us	{ errorMessage: "..."} NOTE: Error TBD by each developing platform if an exception can be caught and returned to calling agent.

11.0 Notification of Student Status

VPT endpoint which listens for the LMS system to communicate when the status of a student taking a course has changed. Initially we are looking for START and COMPLETE events.

Technical Acceptance Criteria

- On START or COMPLETION of a course in an LMS, a notification containing the student ID, site ID, course ID, event type, and date/time of event will be sent.
 { "bookingID":"1234","siteID": "129", "courseID":"8763","eventType":"STARTED", "statusDate":"2018-07-29 13:34:34" }
- HTTP Status Code 204, 206, 401 and no JSON body
 - Errors will return HTTP Status Code 500 and a JSON body with a property of errorMessage set to a user safe error message
 - { "errorMessage" : "An error has occurred" }

11.1 Endpoint Definition

Env	Vant4ge Events – Called by LMS
URL	BASE URL/API/LMS/{LMS Type}/Subject/Course/Status
Method	PUT

11.2 Input

Variable	Type	Description
userID	string	ID used to represent the student in the LMS
siteID	string	Site ID that the notification was generated from. This the Vant4ge FacilityID.
organizationID	string	Organization ID that identifies the client organization in Vant4gePoint
courseID	string	LMS Identifier for the course enrolled in
eventType	string	Type of event: STARTED, COMPLETED
statusDate	string	Date in format YYYY-MM-DD 24HH:MM:SS of when the subject status in the course changed

11.3 Success Response

Variable	Type	Description
responseMessage	string	Status received

11.4 Body Response Code

HTTP Status Code	JSON Body Returned	Description
200	Y	Success
204	Y	Student not found
401	Y	Unauthorized
500	Y	An error occurred please contact us

12.0 Disenroll a Student from a Course

The LMS will expose an API that allows a student to be disenrolled from a course should a course be mis-assigned or a change in the offender’s ability to take online course work be called into question.

Technical Acceptance Criteria

- Vant4gePoint will send a LMS userID and courseID to the LMS to disenroll the student: {"userID": "1234", "courseID": "8763"} as a JSON object in the body.
- HTTP Status Code 204, 206, 401 and no JSON body
 - Errors will return HTTP Status Code 500 and a JSON body with a property of errorMessage set to a user safe error message
 - {"errorMessage": "An error has occurred" }

Architecture Component: INT_11

12.1 Endpoint Definition

Env	LMS – to be called by Vant4ge
URL	BASE URL/API/Student/Course/Disenroll
Method	PUT

12.2 Input

Variable	Type	Description
userID	string	ID used to represent the student in the LMS
courseID	string	LMS Identifier for the course enrolled in

12.3 Success Response

Variable	Type	Description
responseMessage	string	Student disenrolled

12.4 Body Response Code

HTTP Status Code	JSON Body Returned	Description	Example
200	Y	Success	{ message: "student disenrolled" }
204	Y	Student not found	
400	Y	Course not found	{ errorMessage: "Course not found" }

401	Y	Unauthorized	
500	Y	An error occurred please contact us	<pre>{ errorMessage: "..."} </pre> <p>NOTE: Error TBD by each developing platform if an exception can be caught and returned to calling agent.</p>

13.0 SSO Deep Link into LMS Student Course

The vendor will modify their LMS to expose a method to access the LMS functionality of taking part of a course through a deep link. This deep link will bypass any native dashboard of the LMS allowing the subject direct access to a single specific program offered on the LMS.

Vant4ge will call this endpoint to authenticate the subject into the LMS without requiring the subject to log in. The subject will then be directed to the course content in the LMS identified by the LMS course ID.

Technical Acceptance criteria

- Vant4ge will initiate a REST POST call with an encrypted token and an epoch time in the URL and a JSON object containing LMS userID and courseID in the request body.
- LMS API will return an HTTP Status Code and possibly a JSON body depending upon the result.
- JSON body will contain a URL that will allow the student to SSO into the LMS and land in the course indicated by the courseID
- Vant4ge will redirect the subject to the URL contained in the JSON body. The subject will be taken directly to the LMS course content.

13.1 Endpoint definition

Env	LMS – to be called by Vant4ge
URL	BASE URL/API/Student/SSO/{encToken}/{epoch}
Method	POST

13.2 URL Parameters

Variable	Type	Description
encToken	string	Token created according to algorithm supplied after contract awarded
epoch	long	UTC epoch at the time that the request was created

13.3 POST parameters

Variable	Type	Description
userID	string	ID used to represent the student in the LMS

courseID	string	LMS Identifier for the course
----------	--------	-------------------------------

13.4 Success Response

Variable	Type	Description
URL	string	URL that can be used to SSO the student into the LMS take them directly to the LMS course indicated by the courseID

13.5 Body Response Code

HTTP Status Code	JSON Body Returned	Description	Example
200	Y	Success	{ URL: "http://lms.com/auth/userkey/login.php?key=327107e12944e6e7fc7da8b26567b252&wantsurl=http://lms.com/course/view.php?id=92"}
400	Y	Token does not match or Epoch is older than 5 minutes	
500	Y	An error occurred please contact us	{ errorMessage: "..."} NOTE: Error TBD by each developing platform if an exception can be caught and returned to calling agent.

Vant4ge will create an encrypted token. The LMS will create an encrypted token using the data passed in and compare this with the encrypted token passed by Vant4ge in the URL. If the tokens do not match, return 400 (again structure and algorithms of the token will be supplied after the contract is awarded).

If the epoch passed in the URL is older than 5 minutes from the time that the request is received by the LMS, return 400.

Otherwise, return 200 and the SSO URL.

The shared secret will be provided during the integration development.

14.0 SSO into Evolve for secure tablets only

Vant4ge offers a Single Sign On functionality for use in secure facilities (i.e. within prisons) that may be used to integrate a subject from a secure tablet into the Evolve application without requiring the subject to log-in to Evolve with a username and password. This is only available in situations where the subject has already logged in to a secure tablet environment where authentication has been performed by the tablet operating system.

This endpoint uses the same encrypted token and epoch authentication that is outlined in [13.0](#)

Technical Acceptance criteria

- LMS or tablet application launcher on the operating system generates epoch and encrypted token
- LMS or application launcher would POST to {BASE URL}/API/LMS/SSO/Authenticate/{lmsType}/{encToken}/{epoch} with request body {"UserId":"123456","FirstName":"John","LastName":"Tester","OrganizationID":18,"FacilityID":189}
- Vant4ge receives POST at Events API SSO endpoint
- Vant4ge checks that the epoch from the URL < DateTime.Now - 5 minutes
- Vant4ge creates an encrypt token
- Vant4ge compares the encrypted token from the URL with the encrypted token on the Vant4ge side.
- If they match, continue and return the URL to access Evolve or the error page. Else, 401

14.1 Endpoint definition

Env	LMS – to be called by Vant4ge
URL	BASE URL/API/LMS/SSO/Authenticate/{LMS Type}/{encToken}/{epoch}
Method	POST

14.2 URL Parameters

Variable	Type	Description
lmsType	string	Constant that identifies the LMS. Provided during the integration process.
encToken	string	encToken created according to the algorithm supplied after contract is awarded
epoch	long	UTC epoch at the time that the request was created

14.3 POST parameters

Variable	Type	Description
userID	string	ID used to represent the student in the LMS
firstName	string	Student first name
lastName	string	Student's last name
organizationID	int	OrganizationID that identifies the organization in Vant4gePoint
facilityID	int	Unique number that identifies the facility in Vant4gePoint.

14.4 Success Response

Variable	Type	Description
URL	string	URL that can be used to SSO the student into Evolve

14.5 Body Response Code

HTTP Status Code	JSON Body Returned	Description	Example
200	Y	Success	{ URL: ""http://lms.com/auth/userkey/login.php?key=327107e12944e6e7fc7da8b26567b252&wantsurl=http://lms.com/course/view.php?id=92"}
401	Y	Checksum does not match Epoch is older than 5 minutes	
500	Y	An error occurred please contact us	{ errorMessage: "..."} NOTE: Error TBD by each developing platform if an exception can be caught and returned to calling agent.

