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DEPARTMENT OF MENTAL HEALTH
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LACDMH
HIDEX (HEALTHCARE INFORMATION DATA EXCHANGE)
LOCUS API
COMPANION GUIDE

VERSION 2024.01

DATE: JANUARY 31, 2025

REVISION HISTORY

Date	Version	Description	Author
12-10-2024	2024.01	Initial Draft	LACDMH Integration Team
01-31-2025	2024.01	Initial Draft modified with feedback.	LACDMH Integration Team

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Date	Signatory Name	Initials

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1. Introduction

LOCUS stands for Level of Care Utilization System for Psychiatric and Addiction. Los Angeles County Department of Mental Health (**LACDMH**) has adopted the new HL7 FHIR standards to exchange LOCUS data between Trading Partners' (**TP**) electronic health record systems and LACDMH. An Application Programming Interface (**API**) is created to perform this data exchange.
The Locus API is a RESTful API with endpoints that can be used to create a Worksheet for performing a LOCUS assessment on a client, which can then be submitted for evaluation and get assessment based score and service recommendation. This is based on current version 20.

2. Technical Overview

LACDMH is using JSON format in REST service to exchange LOCUS data between TPs' electronic health record systems and LACDMH using FHIR resources identified in HL7. For a better understanding of these technical terms, please refer to the Glossary of Terms below.

2.1 Glossary of Terms

HL7 stands for Health Level Seven. It is a set of international standards that define a common format for the exchange of healthcare data. HL7 standards are used by healthcare providers to transfer clinical and administrative data between software applications.

FHIR stands for Fast Healthcare Interoperability Resources. It is the newest HL7 standard that defines a set of data elements and resources that can be used to exchange healthcare information between different systems. FHIR is designed to be lightweight, easy-to-use, flexible, and extensible, making it a suitable standard for a wide range of healthcare applications. FHIR is a promising standard that has the potential to improve the interoperability, efficiency, and quality of healthcare. It is based on the web standards REST and JSON.

REST stands for Representational State Transfer. It is an architectural style for designing web services. RESTful web services are based on the HTTP methods, such as GET, POST, PUT, and DELETE. RESTful web services are designed to be simple and easy to use. They are also designed to be scalable and extensible. This makes them a good choice for a variety of applications of many industries including healthcare

JSON stands for JavaScript Object Notation. It's a lightweight data-interchange format that's often used in web applications and APIs. JSON is text-based and uses human-readable text to store and transmit data.

FHIR Resource is a data model that represents a single health-related entity, such as a patient, a doctor, a prescription, or a lab result. These are designed to be interoperable, meaning that they can be easily exchanged between different health care systems, and are defined in a standard format such as JSON or XML.

2.2 API Overview

The LOCUS API is a RESTful web service that facilitates data exchange in JSON format. It uses standard FHIR resources, as defined by HL7, to exchange LOCUS information. The API follows the REST architectural style, meaning it uses standard HTTP methods—to submit and retrieve data. JSON used to structure and transmit the data, providing an efficient way for systems to communicate information.

- Base URL: https://hidex.dmh.lacounty.gov/healthcare
- FHIR Version: v4.0.1
- Access: Only authorized organizations are allowed to use the API. App registration grants access. A security token obtained via OAuth 2.0 using the registered app's credentials is used for API calls.
- Content Type: application/fhir+json

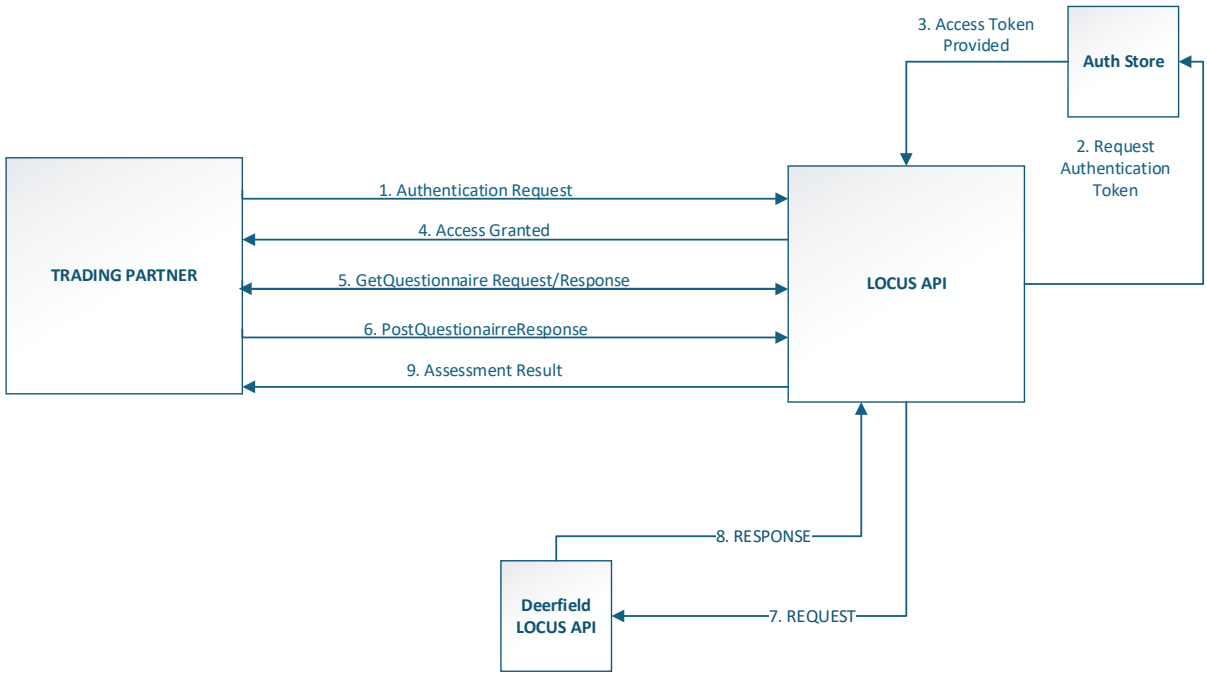
Trading Partners need to start the onboarding process through which they will get a legal contract from LACDMH. For more detailed information please refer to the following page:
https://dmh.lacounty.gov/pc/cp/or/
Once onboarding process is completed, Trading Partners are asked to open a HEAT ticket to start the integration through which they will get App Registration to have secured access to LOCUS API.

The API supports standard FHIR resources related to the LOCUS assessment, primarily focusing on the following:

- Questionnaire (To define assessment questionnaire)
- QuestionnaireResponse (To intake and retrieve assessments)
- Bundle (To show search set for assessments)

2.3 LOCUS API Workflow

Following diagram shows the current workflow for LOCUS API.



The workflow above is explained below:

1. Trading Partner initiates authentication request to LACDMH LOCUS API
2. LOCUS API requests the access token from Authentication Store
3. Authentication Store verifies the request and provides the access token
4. LOCUS API grants Trading Partner access to the API
5. Trading Partner sends a GetQuestionnaire call to LOCUS API to get the definitions of all questionnaire from each dimension and LOCUS API responds with the definitions.
6. Trading Partner submits a PostQuestionnaireResponse to LOCUS API
7. LOCUS API sends the request to Deerfield LOCUS API
8. LOCUS API receives the response from Deerfield LOCUS API with the Assessment Result
9. LOCUS API returns the Assessment Result to Trading Partner

3. Business Rules for submission

Following business rules must be followed:

- Dimensions and Individual Responses must be presented in the same order as in the Instrument. The LOCUS Instrument presents a series of statements to the clinician. These statements are interchangeably referred to as "responses" and "criteria". These responses are grouped into several different “Dimensions”, each of which represents a major topic. The definition of each Dimension is included in the Instrument.
  Descriptions of Dimensions and Individual Responses can be retrieved by making GetQuestionnaire call to LOCUS API.
- Trading Partners are required to specify the individual Response(s) that represent the clinical picture of the client at the time of the assessment. It is not acceptable to merely allow the selection of the 1-5 score for the Dimension. Rather, the user must specify the specific Response(s) that apply.
- Trading Partner must select at least one Response in each Dimension (and each sub-scale, when applicable).
- When storing the results of the assessment to your database, you should retain each of the responses that were selected. This serves to document the entries selected by the assessor, in order to justify to scoring decisions made. It is not enough to say “This client scored a 4 on Risk of Harm.” By recording the individual response(s) selected, we can see WHY the assessor determined that a score of 4 was warranted.

4. User Interface Requirements

Trading Partners’ User Interface should have the following:

• All of the text for the Dimension, any introductory paragraphs, each of the five scoring ranges, and the text for all of the Responses must remain intact, in the same order as in the Instrument. No additions, deletions or edits to this text are permitted.

• The introductory paragraphs for each Dimension do not necessarily have to be present on the entry screen, but at minimum must be easily available to the user, such as via clicking on a button or similar.

• The system must be able to handle special “override” Responses. There are a few specific Responses with special rules, which when selected must “lock out” the ability of the user to select other specific Responses within that Dimension. (In the manner of “if you select Response A, you cannot also select B, C, D or E”).

• The definitions of each of the Levels of Care must be easily accessible to the users. These Level of Care definitions should be available to the user via clicking on a button or similar.

• A report of the assessment results must be created in order to complete the certification process. This report must minimally provide:

- *Date the assessment was completed. It is recommended to show the time of completion as well.*
- *LOCUS Recommended Level of Care*
- *The score (1-5) for each of the seven Dimensions*
- *The individual Response items that were selected within each Dimension's highest rating.*

5. Key FHIR Resources

The following REST methods have been implemented using the respective FHIR resource profiles through the LACDMH LOCUS API. Each URL will show the API syntax, function names, required and optional parameters supported and their data types, return variables and their types/structures as per HL7 FHIR standard:

FHIR API REST Method	Based On	Resource Definition URL
getQuestionnaire	Questionnaire	https://hl7.org/fhir/R4/questionnaire.html
postQuestionnaireResponse putQuestionnaireResponse	QuestionnaireResponse	https://hl7.org/fhir/R4/questionnaireresponse.html

Each method is described in details below:

5.1 QUESTIONNAIRE

Questionnaire resource is used to identify all assessment questions for LOCUS Adult assessment.

5.1.1 Questionnaire Use-Cases

Use Case #	Description	LACDMH FHIR Service Method
1	TPs want to view the Assessment questions for LOCUS.	GetQuestionnaireLOCUS

5.1.2 GetQuestionnaireLOCUS_Input

A GetQuestionnaire method can be used to retrieve all the LOCUS Adult assessment questionnaire and their related codes and linkIDs. The following syntax should be used:
https://hidex.dmh.lacounty.gov/healthcare/Questionnaire?title=LOCUS_Adult

5.1.3 GetQuestionnaireLOCUS_Output

Download the JSON file from the following link:
https://file.lacounty.gov/SDSInter/dmh/1176834_GetQuestionnaireLOCUS_Output.json

5.2 QUESTIONNAIRERESPONSE

QuestionnaireResponse resource is used to intake the submision all assessment questionnaire answers for LOCUS Adult and return back the assessment score and recommendation for care.

5.2.1 QuestionnaireResponse Use-Cases

Use Case #	Description	LACDMH FHIR Service Method
1	TPs want to submit the LOCUS assessment for a particular client and get the score and recommendation.	PostQuestionnaireResponseLOCUS

5.2.2 PostQuestionnaireResponseLOCUS_Input

Download the JSON file from the following link:
https://file.lacounty.gov/SDSInter/dmh/1176836_PostQuestionnaireResponseLOCUS_Input.json

5.2.3 PostQuestionnaireResponseLOCUS_Output

Download the JSON file from the following link:
https://file.lacounty.gov/SDSInter/dmh/1176838_PostQuestionnaireResponseLOCUS_Output.json

5.3 Search Parameters

The LOCUS API supports standard FHIR search parameters. The following are common search parameters for each resource:

- Questionnaire: title; use title=LOCUS_Adult
- QuestionnaireResponse: tag, identifier, patient

Refer to the FHIR Search API following link for complete details on search parameters:

https://hl7.org/fhir/R4/questionnaireresponse.html#search

5.4 Exception Handling

Errors will be returned as OperationOutcome resources as per the FHIR standard. Typical HTTP status codes used by the API are:

- 200 OK: Successful request.
- 400 Bad Request: Invalid request, typically due to incorrect query parameters.
- 404 Not Found: No matching resources found.
- 500 Internal Server Error: Unexpected error occurred on the server.

Example error response:


```
{
  "resourceType": "OperationOutcome",
  "issue": [
    {
      "severity": "error",
      "code": "invalid",
      "details": {
        "text": "Invalid query parameter 'unknown'"
      }
    }
  ]
}
```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