

Single Patient EHI Export Data Overview and User Instructions

Single patient Electronic Health Information (EHI) Export allows for the extraction and export of a single patient's EHI from an Office of the National Coordinator for Health IT (ONC)-certified Millennium system in an electronic and computable (machine-processable) format. The single patient export process extracts all data for a single patient in the target Millennium system, transforms it where necessary for consumption, and creates one or more .zip files to hold the data. This data includes core EHR data stored in a traditional Millennium database along with data created by Millennium applications contained in ancillary storage systems, including multimedia content (e.g., Digital Imaging and Communications in Medicine (DICOM), audio/video, and traditional image files).

The following information provides instructions for consumers of an export to understand and make use of the data as a complement to the provided data format specification files. The actual data format specifications are available in the .zip file titled "Single Patient EHI Export Data Format Specifications" published alongside this document at <https://www.oracle.com/health/regulatory/certified-health-it/>.

Extract Artifacts

The .zip file produced by the single patient EHI Export operation contains extracted data organized in directories. Subdirectories take various forms depending on the source of the data as described below.

Core Millennium EHR data is stored in SQL files. The data can be accessed by first running the schema/Data Definition Language (DDL) files into an empty MySQL database. This creates the tables while the activity and reference SQL files are subsequently uploaded into the database to fill them with rows. After these are uploaded, the database can be queried with standard SQL statements, if desired. The table and column layouts are included in the data model reports available in the .zip file titled "Single Patient EHI Export Data Format Specifications" published alongside this document at <https://www.oracle.com/health/regulatory/certified-health-it/>

Data files originating from external sources (e.g., images and documents) configured by the healthcare organization are stored as described below.

Data Source	Filename Format	Extraction Directory (relative to base extract directory)	Description
Core Millennium EHR Schema	V500<object_type>Schema <_##>.sql <ul style="list-style-type: none">• V500ForeignKeySchema.sql• V500IndexSchema.sql• V500PrimaryKeySchema.sql	../v500/schema	SQL files containing various DDL statements with 1-N files per database object type to be used to re-create the necessary Millennium schema within an empty MySQL database.

Data Source	Filename Format	Extraction Directory (relative to base extract directory)	Description
	<ul style="list-style-type: none"> • V500TableSchema.a.sql 		
Core Millennium EHR Activity Data	<table_name><_##>.sql	./v500/activity	SQL files containing multiple insert statements with 1-N files per table with valid data to be uploaded in an empty MySQL database.
Core Millennium EHR Reference Data	<table_name><_##>.sql	./v500/reference	SQL files containing multiple insert statements with 1-N files per table with valid data to be uploaded in an empty MySQL database.
Oracle Health Multimedia Storage	<media_identifier_id>.<file_extension>	./camm	<p>Files stored in the Oracle Health Multimedia Storage archive related to the extracted person. The file extension will be dependent on whatever the file type was in the archive. If the file type was unable to be determined then ".unknown" will be the file extension. The media_identifier_id refers to media_object_identifier column on the dms_media_identifier table in v500.</p> <p>V500 Query</p> <pre>select * from dms_media_identifier where media_object_identifier = <media_identifier_id>;</pre>
Digital Imaging and Communications in Medicine (DICOM)	<sop_instance_uid>.dcm	./dicom/<study_uid>	<p>Digital Imaging and Communications in Medicine (DICOM) images related to the extracted person. The study_uid refers to the value of the blob_handle column on ce_blob_result for certain storage codes.</p> <p>V500 Query</p> <pre>select * from ce_blob_result br where br.blob_handle = <study_uid> and br.storage_cd in (select code_value from code_value where code_set = 25 and cdf_meaning = 'DICOM_SIUID')</pre>
Oracle Health Document Imaging	<page_number>.<file_extension>	./edm/<document_id>	Electronic document files related to the extracted person sourced from Oracle Health Document Imaging. The file extension will be dependent on whatever the file type was in the archive. If the file type was unable to be determined then ".unknown" will be the file extension. The document_id could be on either of 2 tables: blob_reference or ce_blob_result.

Data Source	Filename Format	Extraction Directory (relative to base extract directory)	Description
			<p>V500 Query</p> <pre>select * from blob_reference br where br.blob_handle = <document_id> and br.storage_cd in (select code_value from code_value where code_set = 25 and cdf_meaning = 'OTG'); select * from ce_blob_result br where br.blob_handle = <document_id> and br.storage_cd in (select code_value from code_value where code_set = 25 and cdf_meaning = 'OTG');</pre>
One Plan/ Longitudinal Plan	<output_id>.ndjson	./longplan	<p>One Plan data stored in <i>HealthIntent</i> Longitudinal Plan coalesced into multiple ndjson files related to the extracted person. The Longitudinal Plan folder will contain <u>five</u> files representing the Longitudinal Plan data for a consumer. The data will include a consumer's health concerns, goals, activities, strengths, and care plans.</p> <p>The links below have the documentation on what exactly are in the files including the JSON structure, the attributes in the JSON, datatypes of those attributes, and what those attributes represent along with examples.</p> <ul style="list-style-type: none"> • Health Concerns • Goals • Activities • Strengths • Care Plans

Please note – Oracle Health Multimedia Storage stores and retrieves any multimedia content in the originating format provided. Whether the originating format is audio files, text files, reports, patient photos, or .pdf, Oracle Health Multimedia Storage will store the content in that format and provide the same format in the export. Export consumers should use the appropriate viewing mechanism for the file type when reviewing the multimedia content.

Artifact Consumption

Millennium database data can be queried by placing data into a MySQL database. That process is described below. Note that the data can also be viewed using a simple text editor but will not be in a user-friendly format that allows for structured querying or retention of cross-table references.

Create Database

1. [Download and install MySQL server](#)
2. Create new database/schema in the database
 - a. Set the database character set to *latin1*
 - b. Set the max packet size to 1GiB ([reference](#))
 - c. Disable foreign key constraint checks

Load data

Upload the SQL files contained in the .zip file into the empty MySQL database in the following order:

1. All V500TableSchema*.sql files.
2. All V500PrimaryKeySchema*.sql files.
3. All V500IndexSchema*.sql files.
4. All V500ForeignKeySchema*.sql files.
5. All V500 Activity and V500 Reference files.

Data model

Data model documentation is available in the EHI MYSQL DATA MODEL.zip. included in the master .zip file titled “Single Patient EHI Export Data Format Specifications” published alongside this document at <https://www.oracle.com/health/regulatory/certified-health-it/>. Download it and extract all files. Then, open the file at the root level called “start_cerner_millennium_data_model_reports” and navigate to find table and column information contained in your database.