

Data Integration Made Easy

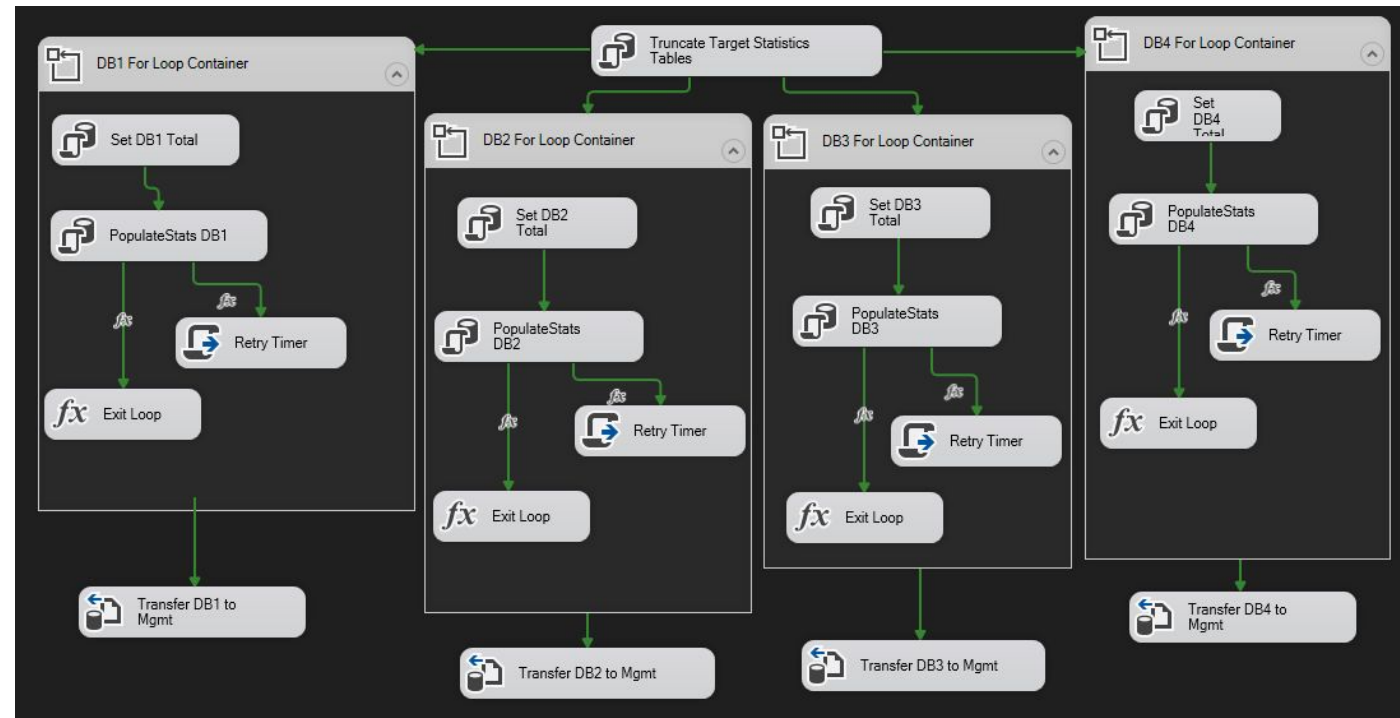
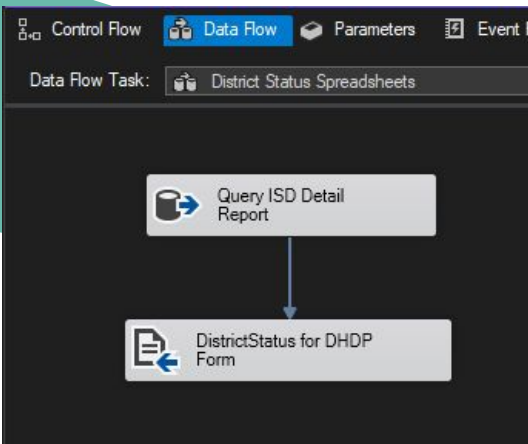
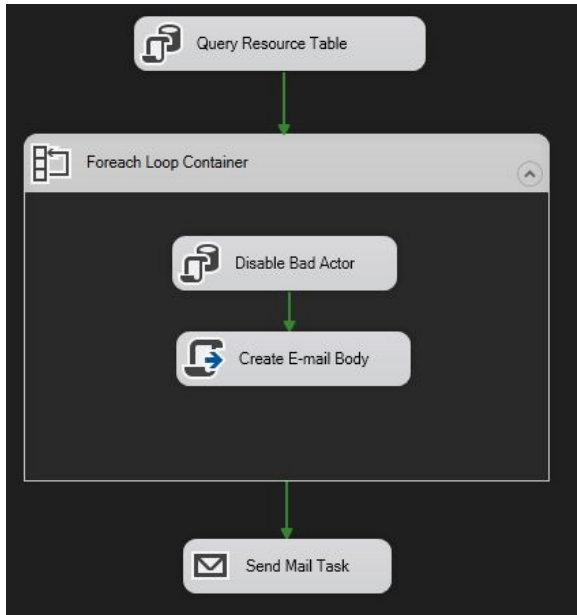
Tony Howard
Sr Database Analyst



KALAMAZOO RESA
INSPIRING EDUCATIONAL EXCELLENCE

About me

- MiDataHub / KRESA - Sr Database Analyst
 - 1.5 years
- Genesee ISD - Student Data Applications Lead
 - 12 years



What is MiDataHub?

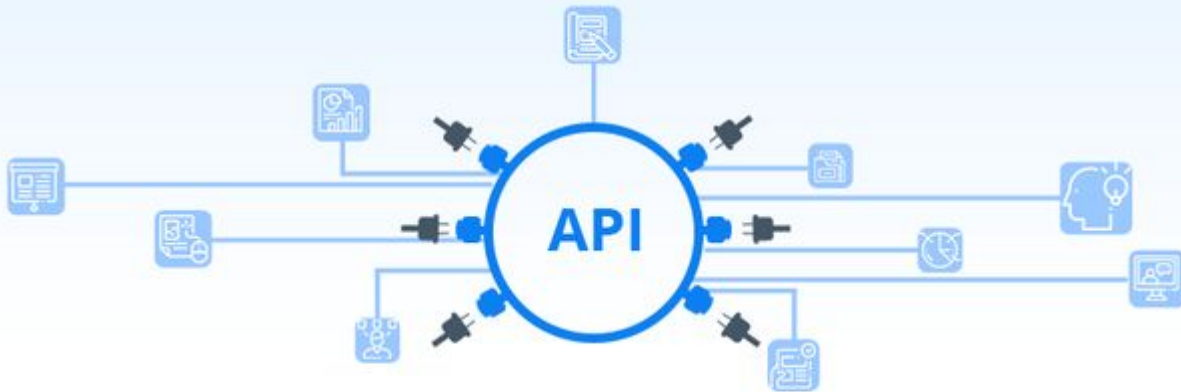


- ❖ Originally started in 2013 during the TRIG grant as Activity 6 - Data Integration Project?
- ❖ Original goal to help districts get ready (from a data perspective) for online learning and online assessments (M-STEP)
- ❖ Additional goal to address the “proliferation of systems”
 - Districts have a large number of data systems, and that is growing over time
 - These systems don’t natively talk to each other, making it difficult to use data
- ❖ Selected the Ed-Fi Data Standard to build an “interoperable ecosystem”
- ❖ Created a cockpit application to make interoperability point and click easy for districts
- ❖ Owned, operated and supported by ISDs and districts in Michigan



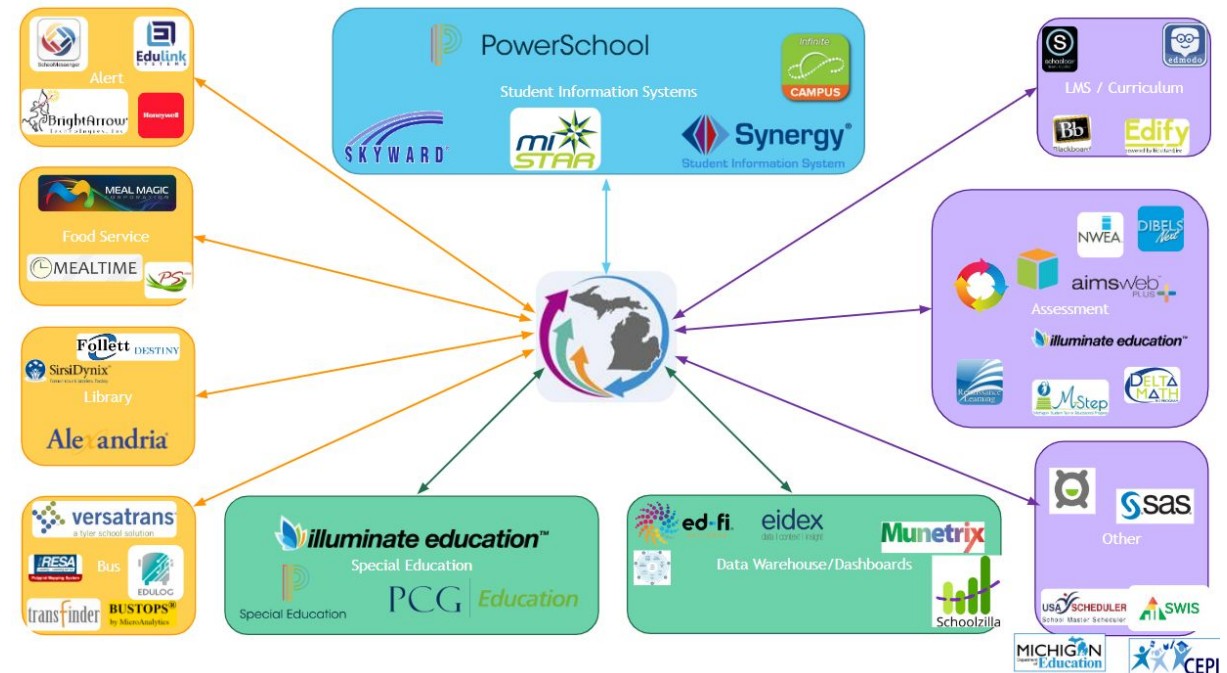
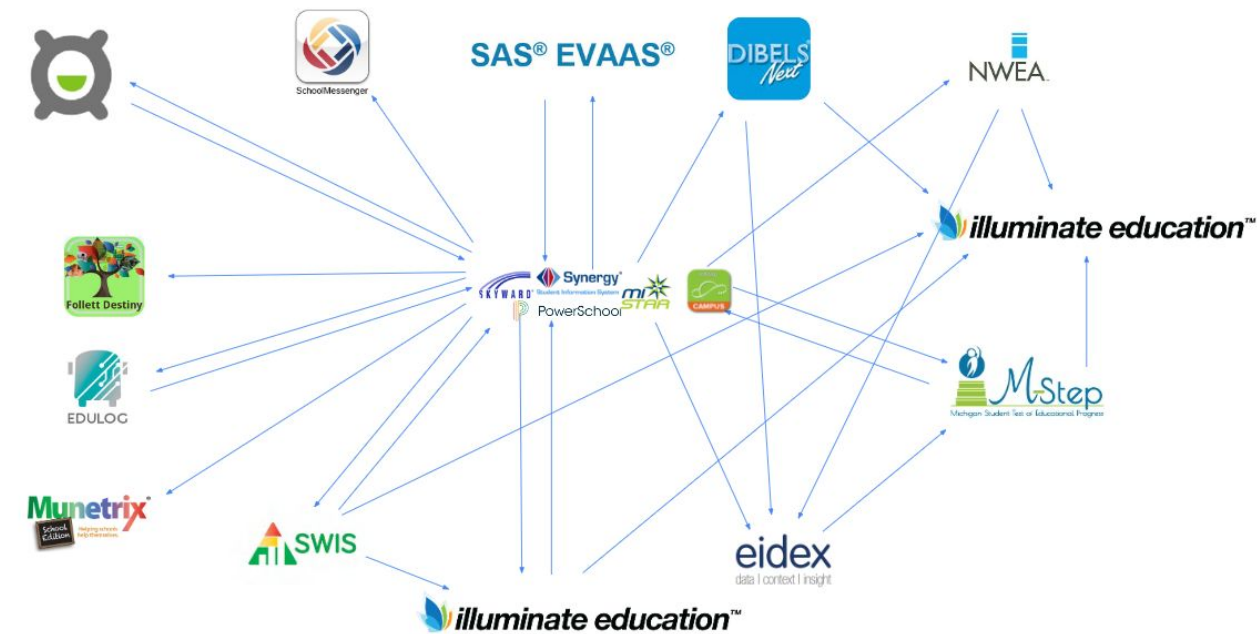
Interoperability

Interoperability is the **seamless, secure, and controlled** exchange of data between applications. Data interoperability is a powerful tool to **transform teaching** and learning and **empower parents and students** with their own data. Solving the data interoperability challenges facing districts and schools is critical to giving teachers the information they need to succeed and to **enable innovation** in classroom practices to help guide students on the path to graduation.



How does that help me?

- ❖ Centralize where integrations are configured
- ❖ Fewer extracts to maintain
- ❖ Simplify activating connections



How it's done

Michigan Launch Pad

Sites that [this org](#) can access:



Additional Sites:



Michigan Data Hub > Anonymized Districts > MiDataHub Demo District

Hello kevin.bullard@kresa.org! Log off

Agreements - Inventory - Reports - Utilities - MSDS - Features -

Manage District: MiDataHub Demo District

Region : Michigan Data Hub
 ISD/Intermediate District Code : Anonymized Districts
 District : MiDataHub Demo District, Id: 983, Code: 900014
 District Type : LEA
 Address : , ,
 URL :
 Current School Year : 2022-2023 (populated)
 SFTP Password :
 Integration Server : HUB-ETL304
 District Status : [Active]

[Submit] [Cancel]

Manage Authorizations

[New Authorization]

Name	Email	Authorizations	Actions
Kevin Bullard	kevin.bullard@kresa.org	District Superintendent	[Edit] [Delete]
Kevin Bullard	kevinrbullard@gmail.com	Technical Contact District Superintendent	[Edit] [Delete]
Windee Wagner	windee.wagner@kresa.org	Technical Contact	[Edit] [Delete]
Dirk Bradley	Dirk.bradly@kresa.org	Technical Contact	[Edit] [Delete]

Inbound Integrations
(show all)

- Add Integration

Outbound Integrations
(show all)

- Add Integration

API Integrations
(show all)

- Student Information System: Infinite Campus 1
- Assessment System: I-Ready 1
- Assessment System: DRC Smarter Balanced Assessments 1
- Data Warehouse: Eidex Insights 1
- Educational Analytics: Extended Benchmark Studies 1
- Add Integration

Systems

Add New

Read by Grade 3 Research	[Settings]
Partnership District Email Access	[Settings]
Benchmark Assessment Mandate Aggregation	[Settings]
Partnership District Data Analysis	[Settings]
Comprehensive Literacy Grant Evaluation	[Settings]
Transitional Kindergarten Study	[Settings]
Extended Benchmark Studies	[Settings]

1EdTech Certifications

Michigan Data Hub has 1 certifications for this product.

v6



Cockpit Application v6 has completed conformance testing for the following 1EdTech Standards ...

OneRoster 1.1

Certified on 2024-06-13 • Registration Number: IMSM2mb2024W1

- OneRoster 1.1 Details:**
- REST Data Provider Rostering Core



MiLaunchpad



MiLaunc



MiLaunchPad (Preferred)

District users (LEA, PSA, ISD)

Log in to EduPaths using your local district login credentials

[Log in with MiLaunchPad](#)

- ▶ **Federated Single Sign-On** - Ability for districts to connect (federate) their AD, Google, Okta or other logins. This allows district staff to sign in with an account they are familiar with, reducing the amount of login issues, and making it easier for district users to access their systems.
- ▶ **MiLaunchpad** - In conjunction with the SSO, a user can access the launchpad and see other applications they have access to. For SSO enabled apps, they simply click on the application and don't need to sign in again.

Michigan Launch Pad

Sites that to [redacted] org can access:



MiAdminConsole



MiDataHub Cockpit



MiDataHub Cockpit
- QA



MiDataHub Cockpit
- ST



MIEWIMS



MIEWIMS - Staging

Additional Sites:



#GoOpen Michigan



EduPaths
Professional
Learning Catalog



MAISA
Events
Portal



Math Nation



MI Math & Science
Leadership Network



MI School Data
www.mischooldata.org



Michigan Virtual



MiServiceDesk



SAS EVAAS

Cockpit Application

Michigan Data Hub > Anonymized Districts > MiDataHub Demo District

Agreements - Inventory - Reports - Utilities - MSDS - Features -

Manage District: MiDataHub Demo District

Region : Michigan Data Hub
ISD/Intermediate District Code : Anonymized Districts
District : MiDataHub Demo District, Id: 983, Code: 900014
District Type : LEA
Address : , ,
URL :
Current School Year : 2022-2023 (populated) ▾
SFTP Password : District Folder
Integration Server : HUB-ETL304
District Status : Active ▾

Manage Authorizations

Name	Email	Authorizations	Actions
Kevin@kresa.org	District Superintendent	<input type="button" value="Edit"/> <input type="button" value="Delete"/>
Kevin@gmail.com	Technical Contact District Superintendent	<input type="button" value="Edit"/> <input type="button" value="Delete"/>
Winda@kresa.org	Technical Contact	<input type="button" value="Edit"/> <input type="button" value="Delete"/>
Dirk B@kresa.org	Technical Contact	<input type="button" value="Edit"/> <input type="button" value="Delete"/>

Inbound Integrations (show all)

- [Add Integration](#)

Outbound Integrations (show all)

- [Add Integration](#)

API Integrations (show all)

- Student Information System: Infinite Campus 1
- Assessment System: i-Ready 1
- Assessment System: DRC Smarter Balanced Assessments 1
- Data Warehouse: Eidex Insights 1
- Educational Analytics: Extended Benchmark Studies 1
- [Add Integration](#)

Cockpit application – allows districts to create integrations and manage everything MiDataHub related.

Each district has their own ODS for each school year that they can fully manage, including:

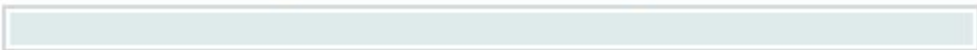
- ❖ Manage Integrations
- ❖ Manage Access
- ❖ Run Reports and Utilities
- ❖ Agreements
- ❖ MSDS
- ❖ Features
- ❖ and more

Inbound Integrations

- ▶ Acadience CSV Assessment Load
- ▶ aimsWebPlus CSV Assessment Load
- ▶ NWEA Data Load - Ed-Fi XML
- ▶ Renaissance STAR CSV Assessment Load
- ▶ SWIS CSV Referral Data Load



Import in Progress

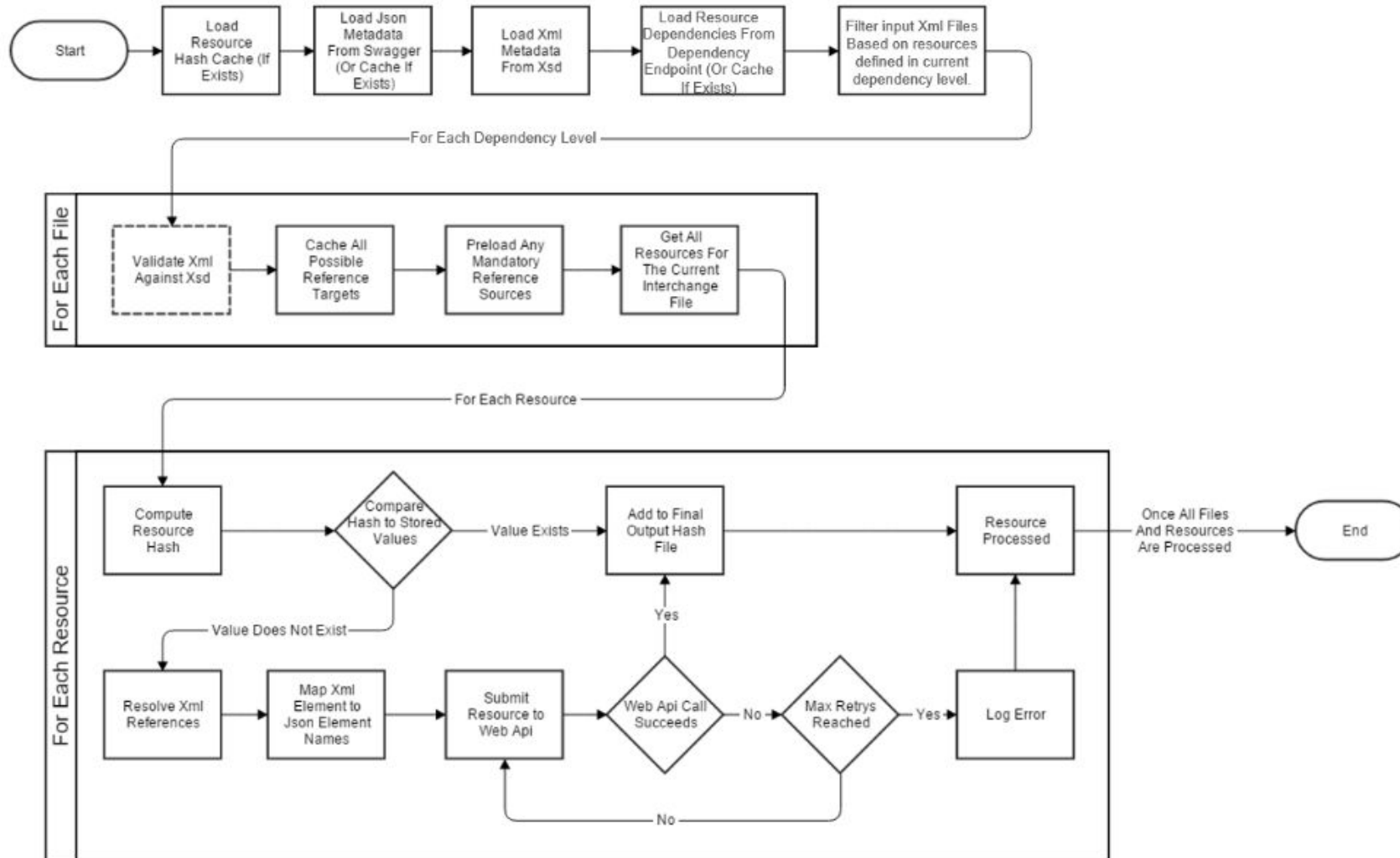


Inbound Integrations
(show all)

- Assessment System: Acadience Reading Benchmark 1 (current)
- Assessment System: Measures for Academic Progress [MAP] Distributed 2 (current)
- Add Integration

How inbounds work?

The general design of the application is a pipeline that takes XML files as input. The pipeline has the following general flow:



Outbound Integrations

- ▶ MiLearn Authorizations and Sections CSV Export
- ▶ Student State Assessment Export
- ▶ SWIS CSV Referral Data Export
- ▶ SWIS CSV Staff and Student Roster Export

Outbound Integrations (show all)

- External System: MiLEARN 1: MiLEARN-Authorizations Data (current)
- External System: MiLEARN 1: MiLEARN-Sections Data (current)
- State-Sourced System: Assessment Importer 1: Request Assessment for Students without Assessments (current)
- Add Integration

Destinations

Destination 1

Status:

Delivery Type:

Location Type: Local Remote

SFTP:

SFTP Port Number:

Path:

User ID:

User Password:

User Password is required.

Compression Type: Compressed Uncompressed

Output to root folder:

Output Folder Name:

Include Timestamp in output name:

+ destination



Custom Exports in MiDataHub

Custom Exports allow access to various student data tables within MiDataHub through custom SQL queries.

- 1. Select Query Tag Dropdown:**
Navigate to Reports > View Custom Exports
This dropdown contains a list of tags associated with various reports. You can think of each tag as a folder that holds a group of related reports, also known as an Export Set.
- 2. Add a New Export Set:**
To create a new Export Set and add it to the Export Set grid, select a tag from the **Select Query Tag** dropdown then click the **Create Export Set** button.
- 3. Export Set Creation:**
Clicking this will open the Export screen and create the Export Set. Once there, click **Save** at the bottom of the screen

Add Outbound Integration

System Type: Behavior Tracking System

Vendor: Other

System: Other Behavior Tracking System - v1

Output Type: Custom Export

Output: Select... (dropdown menu open)

Year: Assessment Queries

System Notes: Combined Discipline Incident and Action Taken Summary

Query Timeout: Data Quality

Destinations: + destination

Schedules

Mode of Instruction (selected)

Staff Detail Query

SWIS

SWIS DataLink Referral Extract

SWIS DataLink Referral Extract QA



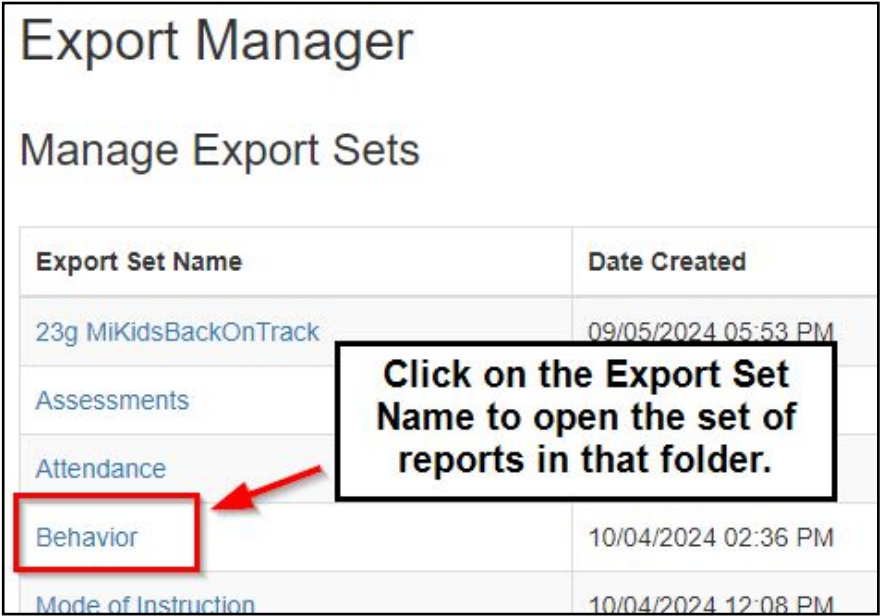
Custom Exports in MiDataHub, continued

4. Return to the Export Manager Screen:

After saving, the system will return to the Export Manager screen, where you'll see the name of the newly created Export Set

5. Access the Export Set:

In the Export Set Name column on the left, click on the Export Set name



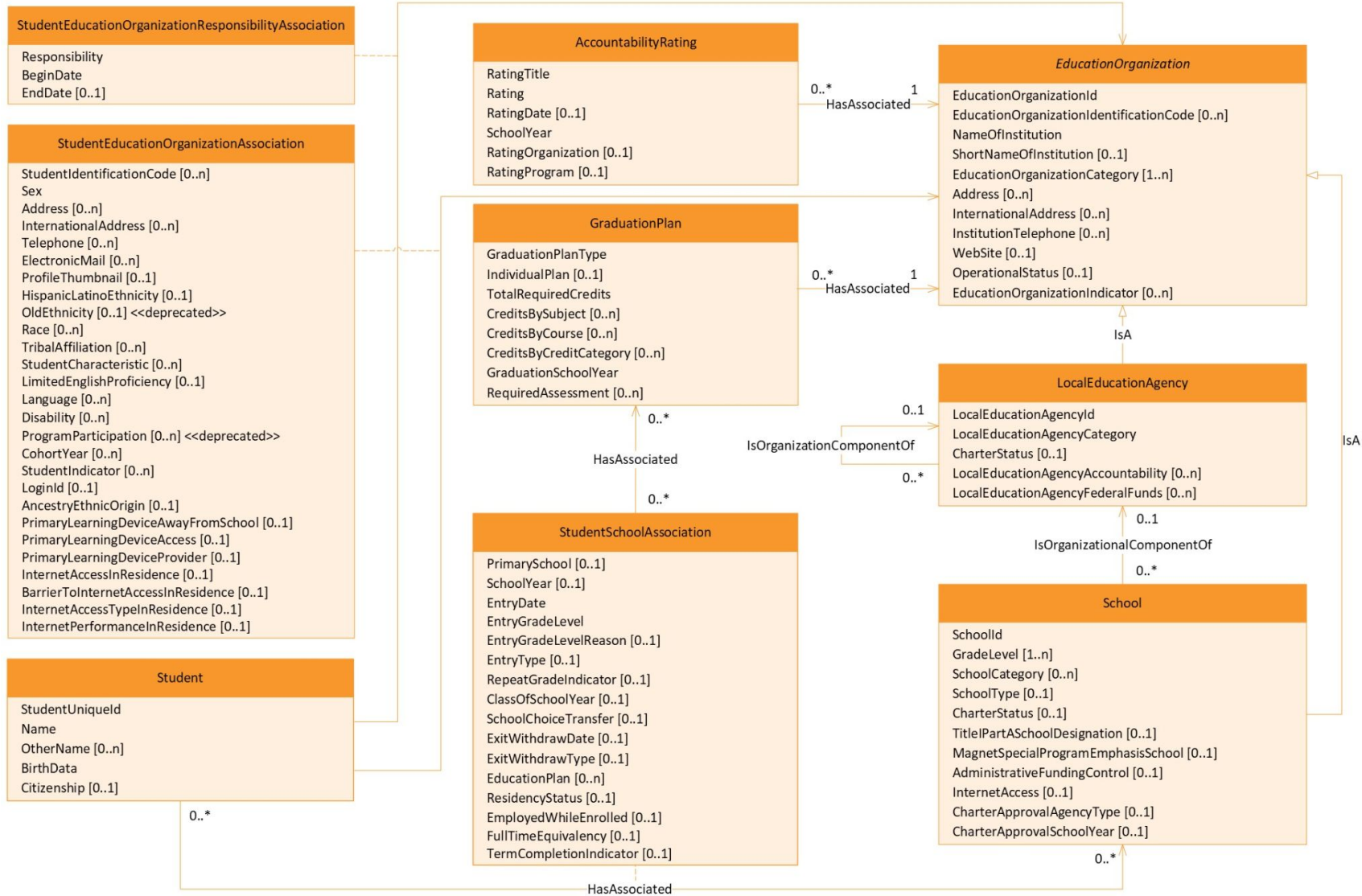
Export Manager

Manage Export Sets

Export Set Name	Date Created
23g MiKidsBackOnTrack	09/05/2024 05:53 PM
Assessments	
Attendance	
Behavior	10/04/2024 02:36 PM
Mode of Instruction	10/04/2024 12:08 PM



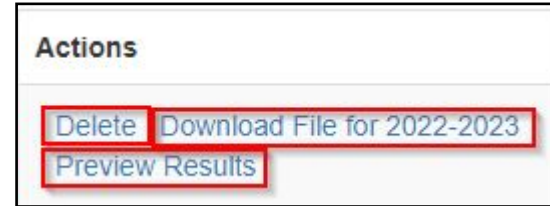
Please don't break my ODS



MICHIGAN
DataHub

View Reports and Actions

On the right side of the screen, under the Actions column, you'll see options for each report

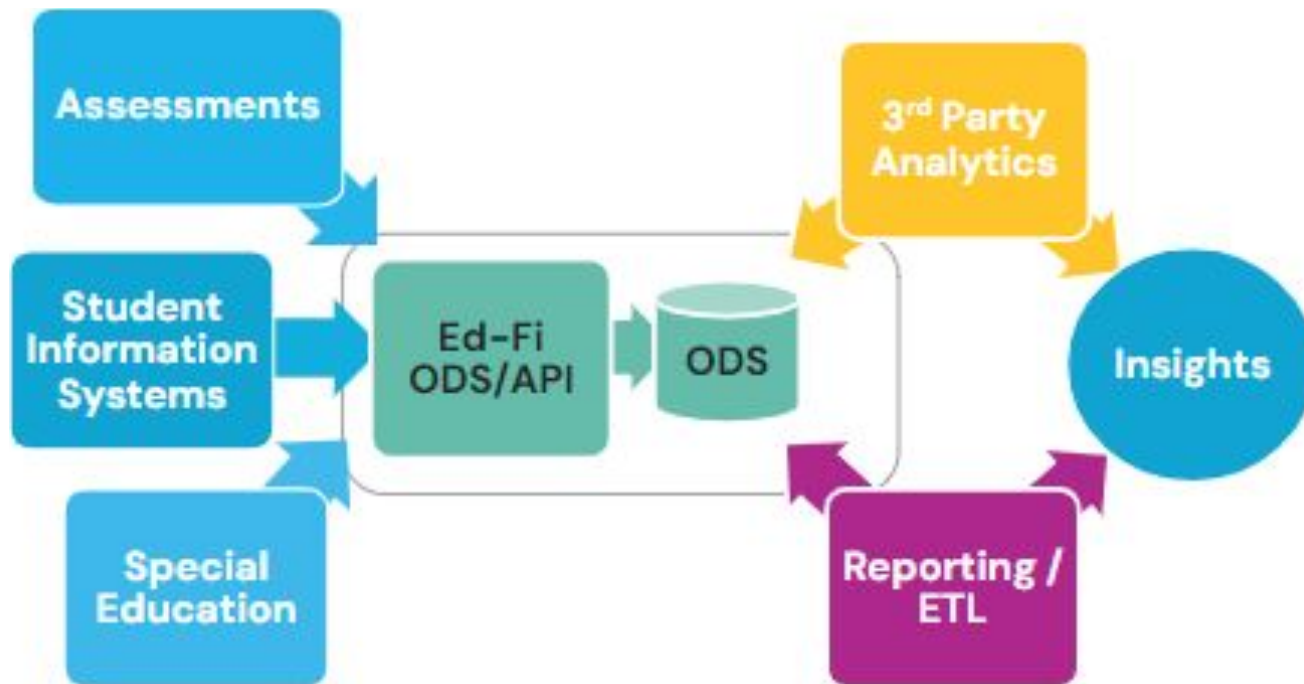


Link to documentation for [Custom Exports in Michigan DataHub](#)



Ed-Fi API

- ▶ Eliminates the challenges of coordinating file exports and transfers
- ▶ Data on demand



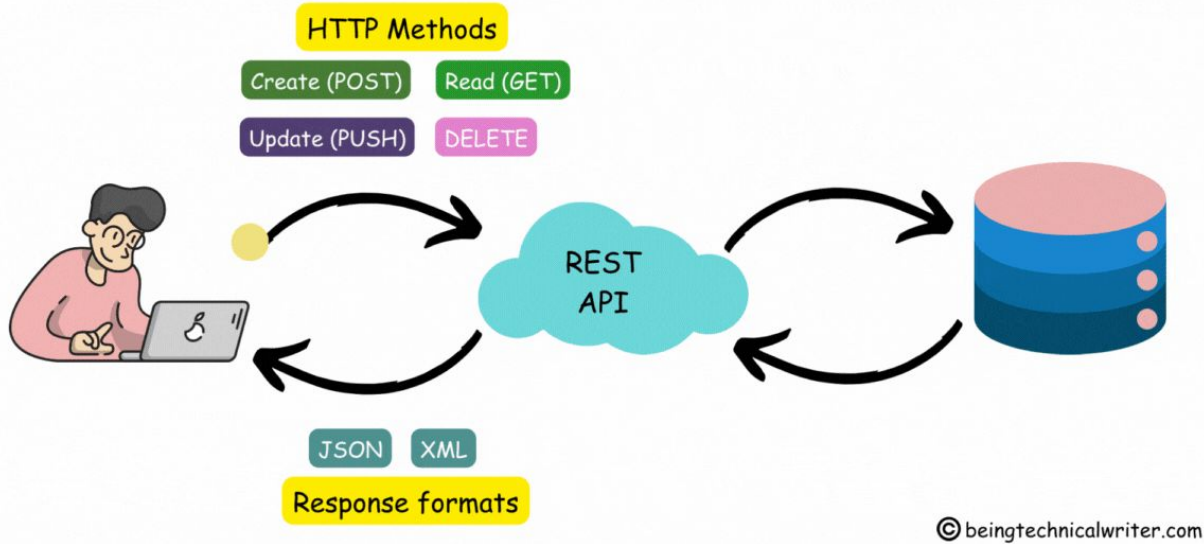
API Integrations

(show all)

- Food Service: MealMagic Suite 1
- Student Information System: PowerSchool 1
- Data Warehouse: Eidex Insights 1
- State-Sourced System: Assessment Importer 1
- Integration Vendors: MiRead File Exchange 1
- Data Warehouse: EVAAS 1
- State-Sourced System: EEM 1
- Educational Analytics: Read by Grade 3 Research 1
- Educational Analytics: Return to Learn Aggregation 1
- Add Integration

What is an API

RESTful APIs



Swagger Petstore

1.0.0 OAS3

This is a sample Petstore server. You can find out more about Swagger at <http://swagger.io> or on [#swagger](irc://freenode.net).

[Terms of service](#)

[Contact the developer](#)

[Apache 2.0](#)

[Find out more about Swagger](#)

Servers

<https://petstore.swagger.io/v2>

Authorize

pet Everything about your Pets

Find out more: <http://swagger.io>

POST /pet Add a new pet to the store

PUT /pet Update an existing pet

GET /pet/findByStatus Finds Pets by status

GET /pet/findByTags Finds Pets by tags

GET /pet/{petId} Find pet by ID

API Requests

HTTP Methods

- GET** for retrieving
- POST** for creating
- PUT** for updating
- PATCH** for patching
- DELETE** for deleting

PROTOCOLS

Always use **HTTPS://** for API calls to ensure security and data privacy

SUB-DOMAIN

Use clear and consistent domain naming conventions. Subdomains (like **api**) are often used for API endpoints.

VERSIONING

Version your API to manage changes and maintain backward compatibility.

ENDPOINT

Use **nouns** to represent resources. Paths should be intuitive and follow RESTful principles.

GET **https://** **api.** **example.com** **/v1/** **users**

?age=25&gender=male&page=2&limit=10

FILTERING

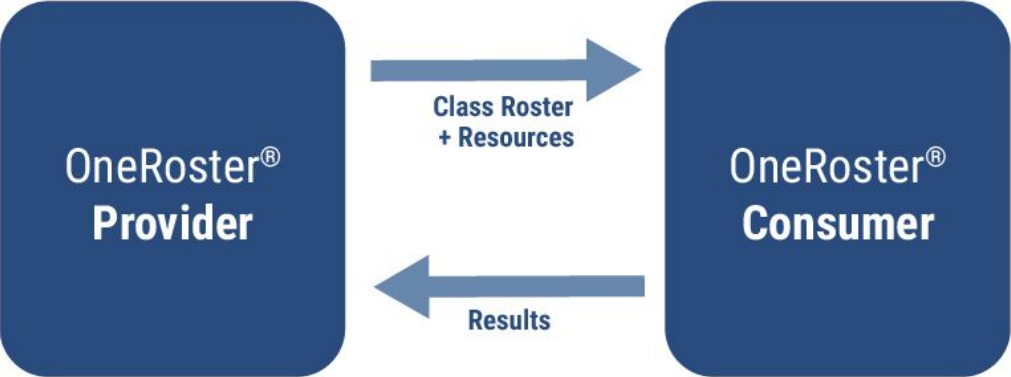
Divide large data sets into pages for manageable chunk retrieval.

PAGINATION

Specify criteria to retrieve relevant data subset; refine search results

OneRoster API

One Roster 1.1



1EdTech Certifications

Michigan Data Hub has 1 certifications for this product.

v6



Cockpit Application v6 has completed conformance testing for the following 1EdTech Standards ...

✔ OneRoster 1.1

Certified on 2024-06-13 • Registration Number: IMSM2mb2024W1

OneRoster 1.1 Details:

- REST Data Provider Rostering Core



OneRoster Mapping

Another example. Let's dig into this one:

```
/Student/StudentSectionAssociation[@HomeromIndicator = "1"]/Section[./CourseOffering/Session[@BeginDate <= current-date() and @EndDate >= current-date()]]/StaffSectionAssociation/Staff/@OneRosterIdentifier
```

1. Start with Student
2. Map to StudentSectionAssociation
 - i. Only include records that have a HomeromIndicator field equal to 1
3. Map to Section
 - i. Only include Sections that have a CourseOffering that has a Session with a BeginDate < today and an EndDate >= today
4. Map to StaffSectionAssociation
5. Map to Staff
6. Return the Identifier field.

Add One Roster Mapping

Metadata Field Name:

HomeroomTeacher

Ods Field Path:

```
/Student/StudentSectionAssociation[@HomeromIndicator = "1"]/Section[./CourseOffering/Session[@BeginDate <= current-date() and @EndDate >= current-date()]]/StaffSectionAssociation/Staff/@OneRosterIdentifier
```

One Roster Field:

Student

Submit

Cancel



OneRoster Usernames

Manage API Integration

System Type: Assessment System

Vendor: Pearson

System : AIMSWebPlus

System Notes :

Authorization URL : <https://apihub.midatahub.org/ods/oauth>

API Endpoint URL : <https://apihub.midatahub.org/ods/data/v3>

Namespace Prefix : uri://pearsonassessments.com

Key :

Secret :



Test API Connection

Generate New Credentials

Profile : None

Status : Active

Permit Access to OneRoster API :

[Edit - Accounts for OneRoster Sample Integration Usenames](#)

One Roster Authorization URL : <https://apihub.midatahub.org/ims/oneroster/v1p1/token>

One Roster API Endpoint URL : <https://apihub.midatahub.org/ims/oneroster/v1p1>

Select Available Scopes :

- RosterCore_ReadOnly
- Roster_ReadOnly
- RosterDemographics_ReadOnly
- Resource_ReadOnly

Year : 2020-2021 (populated)

Edit Application Username

Name: OneRoster Sample Integration Usernames

Student (filled) Parent (filled) Staff

Variables: StudentId FirstName FirstInitial LastName LastInitial EmailAddress

Pattern: {EmailAddress}

Email: Primary email address Filter to @ schooldomain.org email address

Exclude domain name

Preview: john.doe@schooldomain.org
susan.jones@schooldomain.org
mike.wilson@schooldomain.org

Edit Application Username

Name: OneRoster Sample Integration Usernames

Student (filled) Parent (filled) Staff

Variables: StudentId FirstName FirstInitial LastName LastInitial EmailAddress

Pattern: {EmailAddress}

Email: Primary email address Filter to @ schooldomain.org email address

Exclude domain name

Preview: john.doe
susan.jones
mike.wilson

Status: Active

Save

Delete

Cancel



Credential Sharing



Management Portal

Home /



Profile



Learning

Districts

Property Management

Key/Secret Report

Product Catalog

Key/Secret Report

Export

District Name	District Code	Key	Secret
---------------	---------------	-----	--------

Manage API Integration

System Type:

Vendor:

System

System Notes :

Authorization URL : <https://apihub.midatahub.org/ods/oauth>

API Endpoint URL : <https://apihub.midatahub.org/ods/data/v3>

Namespace Prefix : <uri://midatahub.org/vendor/>

Key :

Secret : *****

Test API Connection

Generate New Credentials

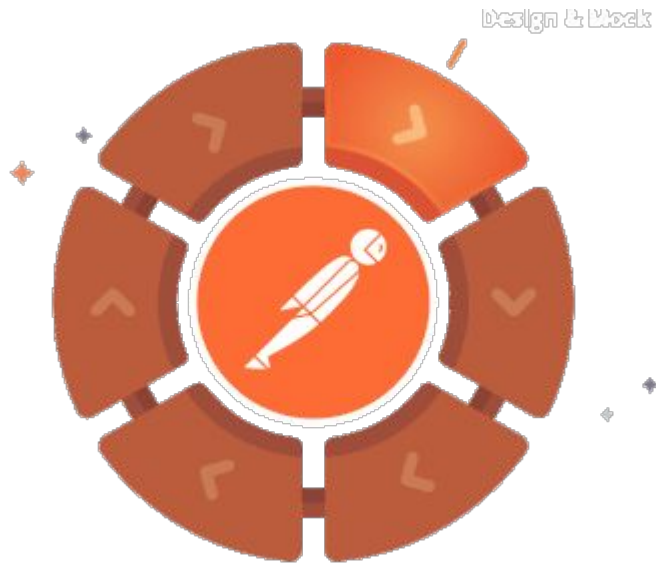
Profile : None

Status : Active

Allow Viewing of Credentials in Management Portal :



How do I API?



- ❖ [Postman](#)
- ❖ [Ed-Fi Academy](#) (trainings / videos)
- ❖ [Using the Ed-Fi API](#)
- ❖ [MiDataHub Swagger](#)

Language	Framework
C	LibCurl
C#	HttpClient
C#	RestSharp
cURL	cURL
Dart	Dart
Go	http package
HTTP	(Raw HTTP request)
Java	OkHttp
Java	Unirest
JavaScript	Fetch
JavaScript	jQuery
JavaScript	XHR
NodeJS	Axios
NodeJS	Native
NodeJS	Request
NodeJS	Unirest
Objective-C	NSURLSession
OCaml	Cohttp
PHP	cURL
PHP	Guzzle

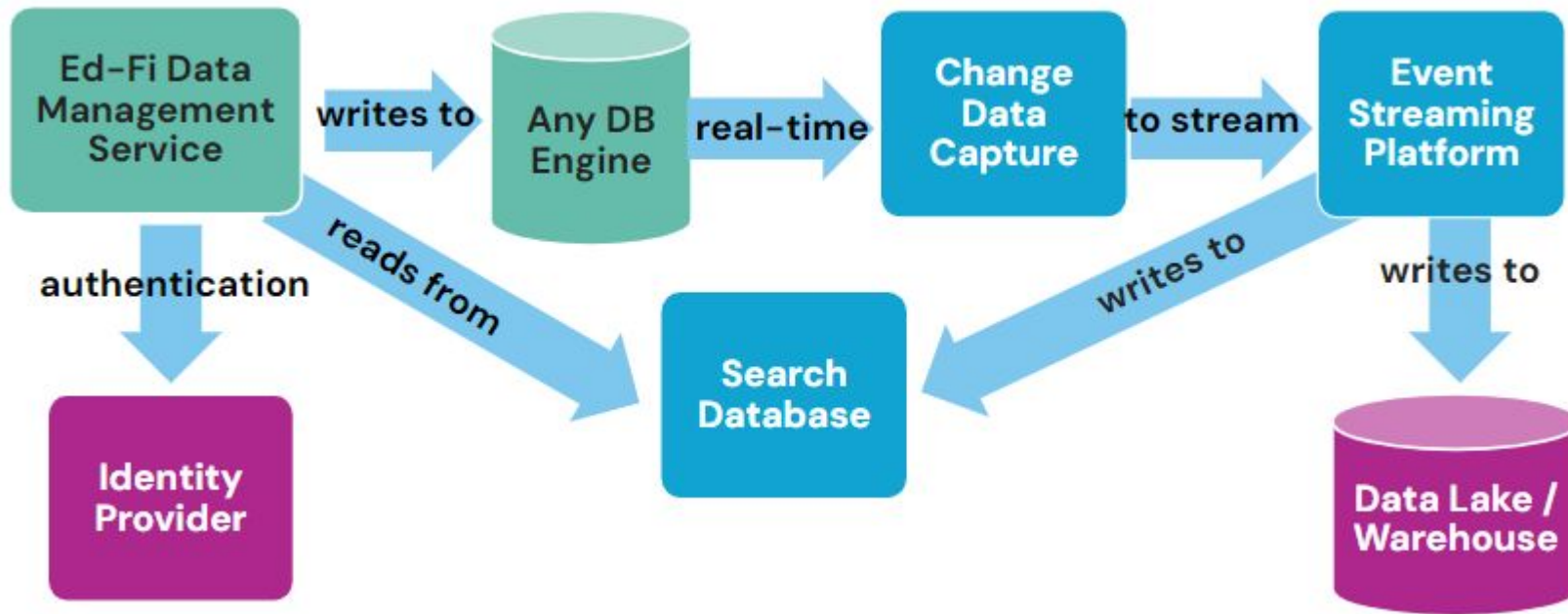
PHP	Http_Request2
PHP	pecl_http
PowerShell	RestMethod
Python	http.client (Python 3)
Python	Requests
R	httr
R	RCurl
Ruby	NET::Http
Shell	Httpie
Shell	wget
Swift	URLSession

Future of Ed-Fi

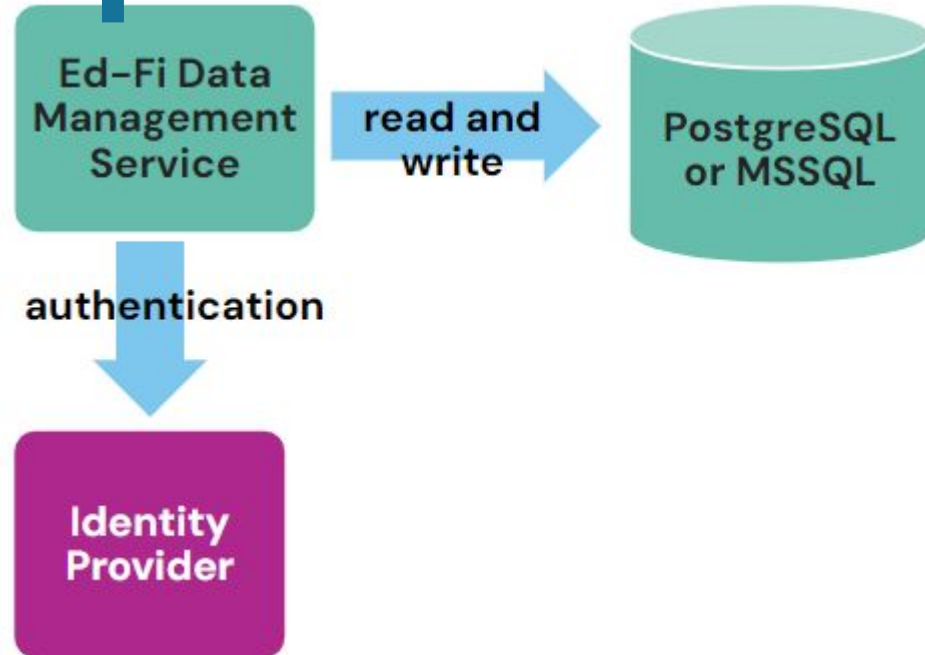
- ❖ Project Tanager
- ❖ Target Release Schedule
 - Available in 2027
 - Dominant in 2029
- ❖ Simplify
 - Code base
 - Data structure
- ❖ Scalability and performance
- ❖ Enable streaming



Tanager Structure



But not necessarily that complex



Non-Relational DB

Really, three tables!

- ❖ **Documents** contains JSON
- ❖ **Aliases** handles inheritance problems
- ❖ **References** supports referential integrity

References			
Guid	parent_referential_id	PK,FK	Parent document with the reference, also clustered PK
tinyint	parent_partition_key	FK	Part of Aliases PK, derived from parent_referential_id
Guid	referenced_referential_id	PK,FK	Document being referenced, also PK
tinyint	referenced_partition_key	FK	Part of Aliases PK, derived from referenced_referential_id
tinyint	partition_key	PK	Partition key for this table, derived from parent_referential_id

2 FKs to Aliases per row, parent and referenced

Aliases			
Guid	referential_id	PK	Extracted or superclassed document identity, clustered
tinyint	partition_key	PK	Partition key for this table, derived from referential_id
Guid	actual_document_uuid	FK	Part of Documents PK
tinyint	actual_partition_key	FK	Part of Documents PK, derived from actual_document_uuid

2 rows with same FK to Documents if subclass, 1 row otherwise

Documents			
Guid	document_uuid	PK	API resource id, clustered
tinyint	partition_key	PK	Partition key for this table, derived from document_uuid
Guid	referential_id		Extracted document identity
string	project_name		Example: Ed-Fi (for DS)
string	resource_name		Example: Student
string	resource_version		Example: 5.0.0
JSON	edfi_doc		The document

Things you may get asked

about

[Benchmark Assessment](#)

➤ **MiDataHub/MDE Deadline 12/6/2024 (not flexible)**

❖ [MiKidsBackOnTrack 23g](#)
➤ [Enable data pull integration](#)

❖ [Renewing SSO Federation](#)

❖ [What can we integrate with?](#)

❖ [Newsletter Sign Up](#)
➤ Past Newsletters on our home page www.midatahub.org

Benchmark Assessment Legislation Status

Links

- [Benchmark Assessment Legislation Readiness Dashboard Checklist](#)

Checks

Required

Integrations in MiDataHub cockpit

- ✔ SIS - 1 passed
 - ✔ Student Information System - Found SIS integrations: PowerSchool
- ✔ Assessments - 1 passed
 - ✔ At least 1 Applicable MDE Identified Assessment enabled - Assessment Integrations: i-Ready
- ✔ Benchmark Assessment Legislation - 1 passed
 - ✔ Benchmark Assessment Legislation - Found integration(s): Extended Benchmark Studies

Data Readiness Status-Current Year

- ✔ Data Readiness Status - 1 passed - 9 info
 - ✔ Students With Assessment Scores without UIC - All Student Assessment Score results have a UIC Associated
 - ❌ Students With NWEA Assessments, Beginning of Year - NWEA Assessment integration not configured
 - ❌ Students With NWEA Assessments, End of Year - NWEA Assessment integration not configured
 - ❌ Students With Renaissance Star Assessments, Beginning of Year - Star integration not configured
 - ❌ Students With Renaissance Star Assessments, End of Year - Star integration not configured
 - ❌ Students With i-Ready Assessments, Beginning of Year - 482 i-Ready assessment records exist for the 521 students in grades where the i-Ready assessment was given. - Assessment records by grade level: 00 - 51, 01 - 57, 02 - 56, 03 - 46, 04 - 51, 05 - 49, 06 - 50, 07 - 71, 08 - 51
 - ❌ Students With i-Ready Assessments, End of Year - 433 i-Ready assessment records exist for the 521 students in grades where the i-Ready assessment was given. - Assessment records by grade level: 00 - 51, 01 - 56, 02 - 57, 03 - 46, 04 - 53, 05 - 47, 06 - 52, 07 - 69, 08 - 2
 - ❌ Students With DRC Assessments, Beginning of Year - DRC integration not configured
 - ❌ Students With DRC Assessments, End of Year - DRC integration not configured
 - ❌ Mode Of Instruction - | FULLY IN-PERSON: 1, 100%



Questions?

