



Ed-Fi Bootcamp 2017

Welcome!

Logistics & Resources

Bootcamp details

- <https://techdocs.ed-fi.org/display/EE/2017+Boot+Camp>

Summit & Bootcamp App

- Download the Conference App: <https://event.crowdcompass.com/edfi-summit>

Bootcamp Wi-Fi

- SSID: EDFIBOOTCAMP2017
- Password: Community365

Ed-Fi Tools – Single Sign On!

- If you didn't receive the SSO welcome email on Monday (from noreply@salesforce.com)
 - If you are Ed-Fi licensee → Check your junk folderthen send a request to techsupport@ed-fi.org
 - If you are not an Ed-Fi licensee → talk to or email Sean Casey (sean.casey@ed-fi.org)
- Temporary URL: <https://dellfoundation.force.com/c365/s/> → <https://c365.ed-fi.org> (after the summit)

Bootcamp 2017 - Presenters

Ed-Fi Alliance



Chris Moffatt [chrismoffatt99](#)



Eric Jansson, [ejansson](#)



Cy Jones [cyjones](#)



Vinaya Mayya, [vimayya](#)



Shannon Kerlick [skerlick-edfi](#)



Sayeelakshmi Srinivasan [sayeelakshmis](#)

Guest Presenters



Benjamin Meyers

Double Line Partners



Brad Banister [bradbanister](#)

Double Line Partners



Dan Malagari [Malagari](#)

Headspring



Geoff McElhanon [gmcelhanon](#)

Certica



Jamie Martinez

Volusia



Curtis Lee

JeffCo



Michael Taylor

Indiana U

New for 2017

- From 1 day with 2 tracks in 2016 ➔ to 1.5 days with 7 tracks!
- Responding to feedback
 - More hands on activities
 - Broader range – both less technical and more technical
- We will be attempting to record breakout sessions

Boot Camp 2017 - Agenda

101 – Ed-Fi Technology Overview (Tues 9:00 – 12:00)

200 – Use Case Focus (Tues 1:00 – 5:00)

- 201 : SEA Implementation (Sayee w/ Ben & Michael)
- 202 : LEA Implementations (Shannon w/ Jamie & Curtis)
- 203 : Vendor Implementations (Cy w/ Vinaya & Geoff)

200 – Technical Focus (Weds 9:00 – 12:00)

- 204: Ed-Fi Tools – MetaEd & MappingEdu (Eric w/ Brad & Sayee)
- 205: Ed-Fi ODS / API – New Capabilities (Chris w/ Geoff)
- 206: Analytics and Visualizations (Cy w/ Dan)

Boot Camp 2017 - Agenda

Day / Time	Theme	Session Title	Presenter(s)	Synopsis
Day 1 8:30 – 9:00	Arrival & Breakfast			
9:00 – 12:00	101-level overview of Ed-Fi Technology	Ed-Fi Technology – 101 (101)	Chris Moffatt Eric Jansson Cy Jones Shannon Kerlick	The focus will be on providing an overview of the full suite of Ed-Fi technology (current on forthcoming), with reference to where in-depth topics will be addressed in the follow-on sessions in the boot camp.
	Lunch			
1:00 – 5:00	200-level tracks, with focus on user-centric implementation scenarios	SEA Implementations (201)	Sayee Srinivasan Ben Meyers (DLP) Michael Taylor (Indiana U)	SEA (and regional) use cases, centered around Ed-Fi “Enterprise ODS”, with in-depth focus on deployment, security.
		LEA Implementations (202)	Shannon Kerlick Jamie Martinez (Volusia) Curtis Lee JeffCo)	Understanding and accessing the Ed-Fi data model (through API and data marts), using the Cloud ODS
		Vendors (203)	Cy Jones Vinaya Mayya Geoff McElhanon (Certica)	In-depth focus on the Ed-Fi API’s, from client application perspective (data management API’s, profiles, composites) & implementing Ed-Fi aligned API's.
Day 2 8:30 – 9:00	Breakfast			
Day 2 9:00 – 12:00	200-level tracks, with focus on advanced technology topics	Ed-Fi Tools – MetaEd & MappingEdu (204)	Eric Jansson Sayee Srinivasan Brad Banister (DLP)	Using MetaEd IDE & MappingEdu to work with the data standard.
		Ed-Fi ODS / API – New Capabilities (205)	Chris Moffatt Geoff McElhanon (Certica)	Topics will include ODS/API v3.0 and the Temporal ODS.
		Analytics and Visualizations (206)	Cy Jones Dan Malagari (Headspring)	Accessing Ed-Fi data for analytics and visualizations using Ed-Fi Dashboards & Commercial off the shelf solutions.



Introduction to Ed-Fi

What most teachers know about a new student when they walk into the classroom



MARIA GARZA



Student: Maria Garza

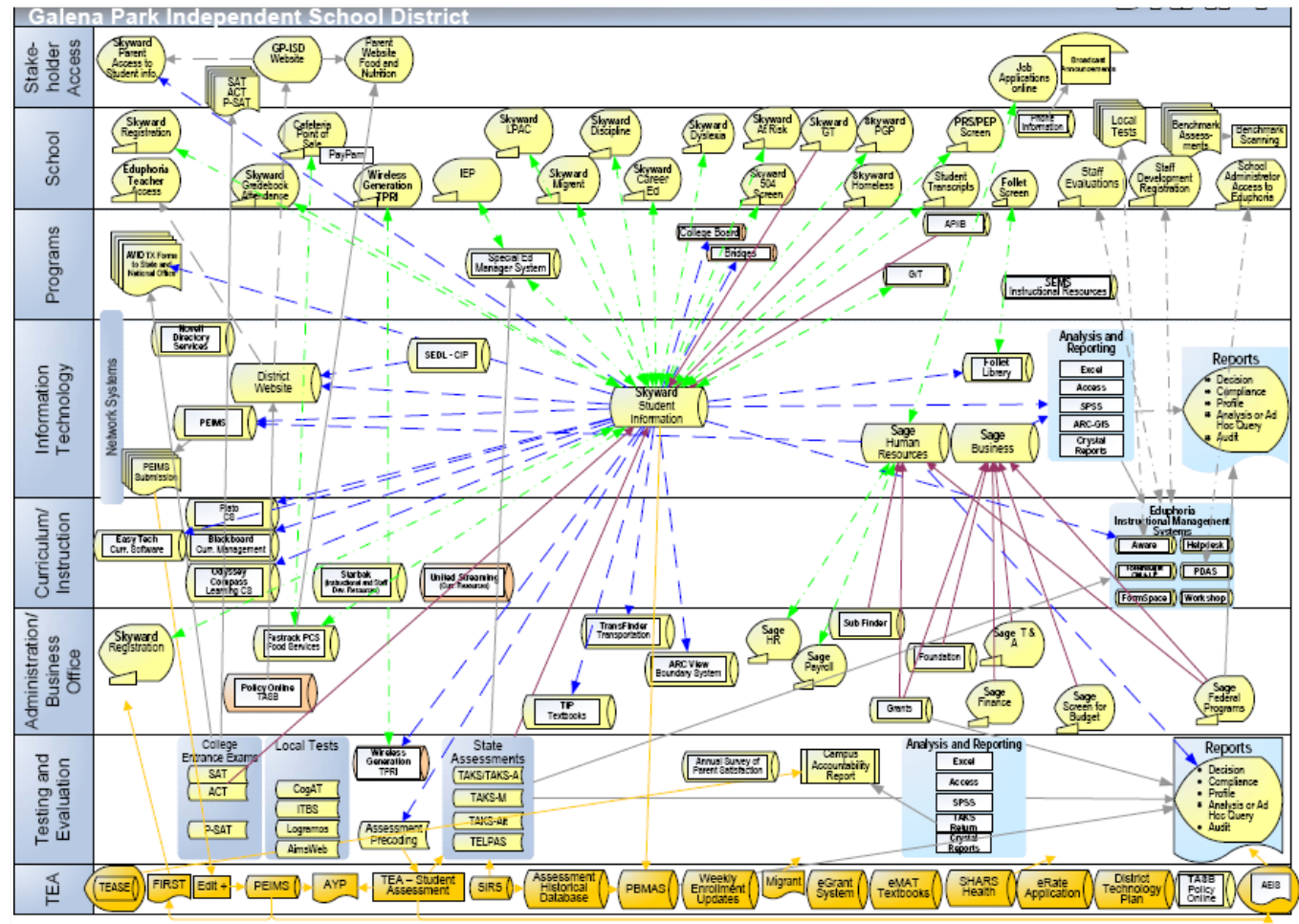
Grade: 11

Comments

High School
Bradock High School

Homeroom:
Mrs. James

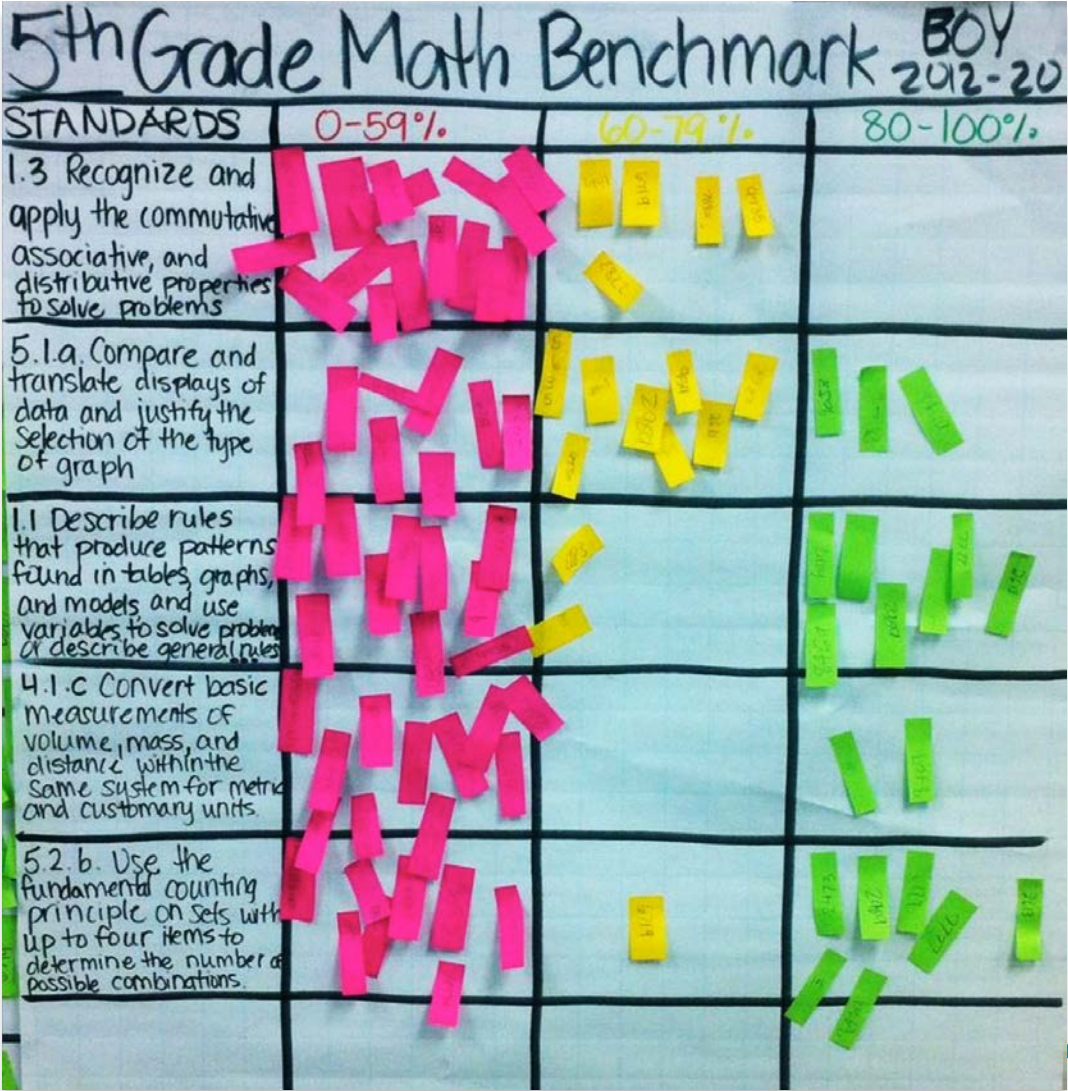
Education Sector IT Systems: Complex, outdated, compliance-oriented reporting



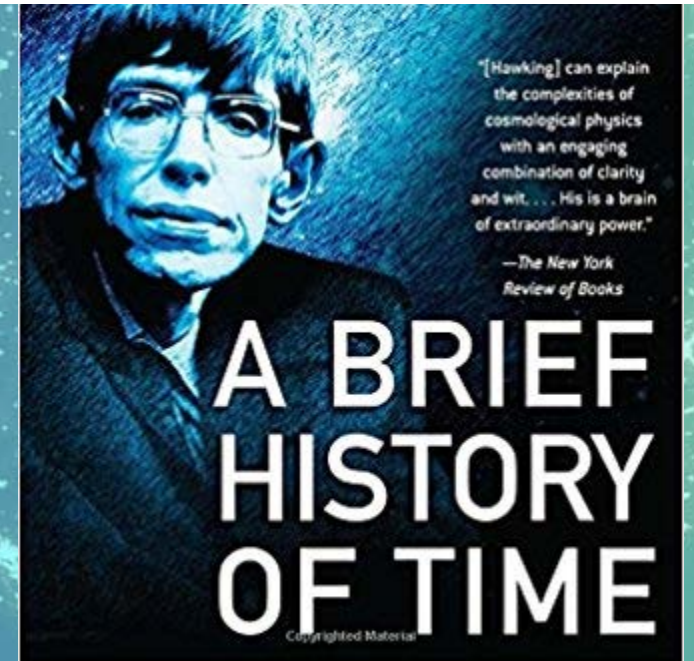
TEXAS EDUCATION AGENCY									
Academic Excellence Indicator System									
2008-09 District Performance									
Indicator:	State	Region 17	District	African American	Hispanic	White	Native American	Asian/ Pacific Is	
TAKS Met 2009 Standard									
Grade 3 (English) First Administration Only									
Reading	2009	90%	90%	88%	80%	85%	97%	*	> 99%
	2008	89%	90%	88%	79%	86%	95%	*	> 99%
Mathematics	2009	86%	83%	80%	66%	77%	94%	*	97%
	2008	85%	83%	81%	67%	79%	90%	*	98%
All Tests	2009	82%	80%	76%	60%	71%	91%	*	97%
	2008	80%	79%	77%	61%	73%	87%	*	98%
TAKS Met 2009 Standard									
Grade 3 (Spanish) First Administration Only									
Reading	2009	84%	95%	97%	*	97%	*	*	*
	2008	83%	88%	87%	*	86%	*	*	*
Mathematics	2009	79%	78%	81%	*	80%	*	*	*
	2008	78%	82%	83%	*	83%	*	*	*
All Tests	2009	75%	76%	78%	*	78%	*	*	*
	2008	73%	78%	79%	*	78%	*	*	*
TAKS Met 2009 Standard									
Grade 4 (English)									
Reading	2009	86%	85%	84%	74%	80%	95%	*	> 99%
	2008	85%	84%	83%	73%	79%	94%	*	> 99%
Mathematics	2009	88%	86%	86%	71%	83%	94%	*	> 99%
	2008	87%	86%	83%	71%	77%	95%	*	> 99%
Writing	2009	92%	91%	92%	87%	90%	96%	*	> 99%
	2008	93%	93%	93%	87%	92%	96%	*	> 99%
All Tests	2009	78%	75%	74%	57%	68%	89%	*	> 99%
	2008	77%	76%	73%	56%	66%	89%	*	> 99%
TAKS Met 2009 Standard									
Grade 4 (Spanish)									
Reading	2009	81%	77%	79%	*	78%	*	*	*
	2008	77%	85%	90%	*	90%	*	*	*
Mathematics	2009	80%	86%	85%	*	85%	*	*	*
	2008	76%	81%	90%	*	90%	*	*	*
Writing	2009	93%	86%	92%	*	92%	*	*	*
	2008	91%	96%	> 99%	*	> 99%	*	*	*
All Tests	2009	73%	67%	68%	*	67%	*	*	*
	2008	69%	81%	88%	*	88%	*	*	*

Educators are using data to inform instruction and improve outcomes for students, but it isn't always easy

	A	B	L	M	AT	AU	AV	AW	AX	AY
1		Unit							Unit 1	Unit 1
2		Assessment Type			Homework	Test	Homework	Test		
3		Grade/Mastery/Helper	[Mastery]	[Grade]	Grade	Grade	Grade	Grade	Mastery	Mastery
6	Class	Name	Total Mastery	Overall Grade	Homework 1	Test 1	Homework 2	Test 2	Learning Goal 1	Learning Goal 2
7	1	Jack	100.0	92.5	100	94	84	92	4	3
8	1	Liz	50.0	85.3	95	78	85	83	4	2
9	1	Jen	100.0	92.0	100	87	95	86	3	4



A BRIEF HISTORY OF TIME ED-FI



Genesis of Ed-Fi (~2008/9)

1. Realization
Dell Found
expensive
disparate
2. IBM study

IBM Global Business Services

January 27, 2009



Texas Education Agency

Texas Education Agency
1701 N. Congress Avenue
Austin, TX 78701-1494

**TEA Data Collection, Analysis and Reporting Systems
Investigation (TDCARSI)
Issues and Recommendations**

Michael & Susan
hardest and most
and aggregating
agency (TDCARSI)

http://ritter.tea.state.tx.us/tea/IBM_TDCARSI_Recommendation.pdf

Genesis of Ed-Fi (~2008/9)

1. Inability of current system to deliver data that is timely, relevant, and actionable
2. Current data collection model imposes significant burden on local districts
3. Lack of statewide standards for ISD data systems
4. Difficult to integrate student data across data sources due to limited use of the unique Texas Student Identifier
5. Cumbersome and inefficient reporting and analysis capabilities
6. Inability to easily access comprehensive longitudinal data
7. Lack of agency-wide standards for data collection and storage
8. Lack of a single TEA point of contact for all data collection to resolve issues



1. Streamed data collection model of disaggregated student data into an Operational Data Store (ODS)
2. District and TEA validated data loaded into a data warehouse to support program analysis and reporting
3. Business intelligence and reporting tools to support end user analysis and reporting
4. Unique statewide Texas Student Identifier (TSID) embedded in the collection and integration of the data
5. Use of a Unique Teacher Identifier (UTI) and creation of a classroom link
6. Creation of a voluntary state sponsored Student Information System (SIS)
7. Establishment of an Enterprise-wide Data Governance Strategy and Board
8. Establishment of a TEA Enterprise Data Management Office (EDMO)

Figure 1-1 TDCARSI Stakeholder Issues

Figure 1-4. Summary of Recommendations

Ed-Fi – Gen 1 (~2011 – 2013)

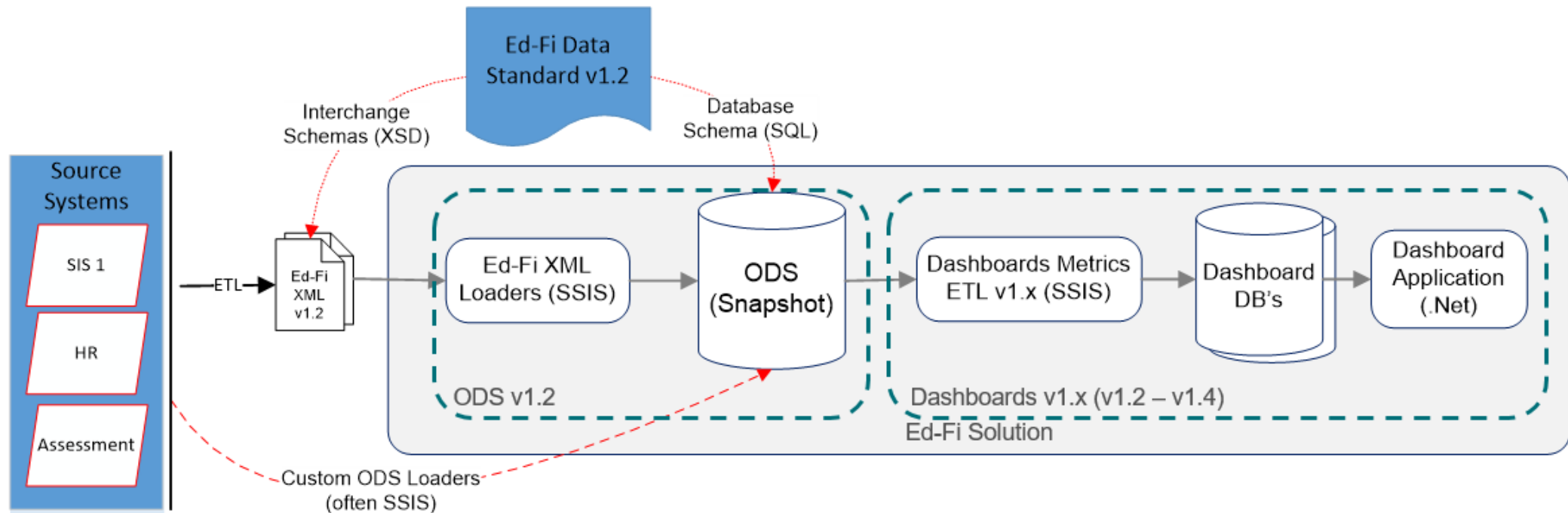
“The Ed-Fi Solution accelerates student achievement by extracting student information from a variety of sources, and integrating the data into Web-based dashboards, reports and other applications...”



Ed-Fi – Gen 1 (~2011 – 2013)

v1.x Data Standard → largely informed by Ed-Fi Dashboard use-cases* - targeted at SEA deployments

v1.x Technology → batch/bulk-oriented approaches to data ingestion and transformation



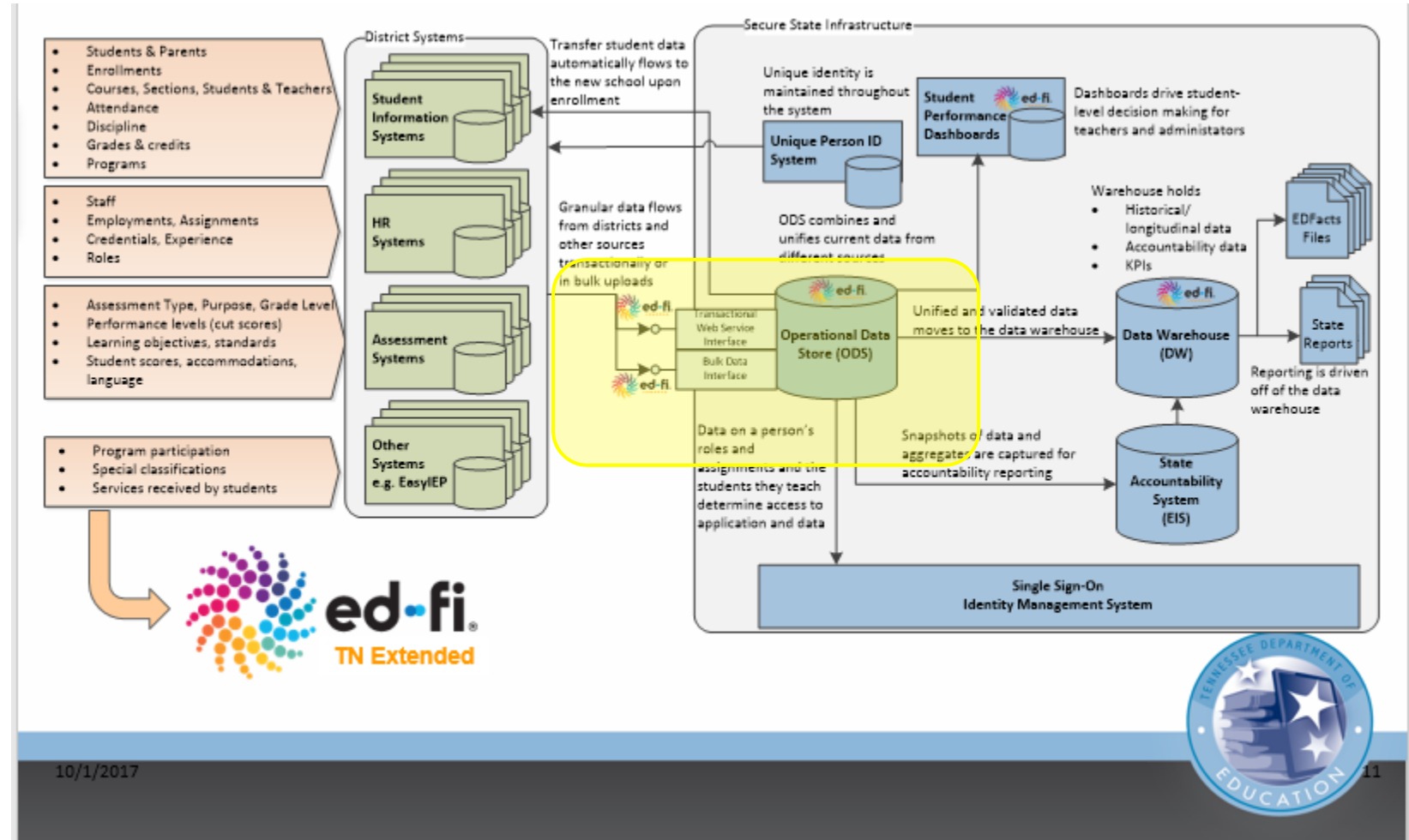
Ed-Fi v1.x Solution Stack

Ed-Fi – Gen 2 (~2014 – Current)

Central theme -> Activating the Ed-Fi ecosystem to realize the promise of (near) real-time data → REST API's

The path was forged by the Tennessee DOE's Ed-Fi Implementation

Pro Tip: Attend the ODS/API – New Capabilities session on Weds for “The rest of the story”



Ed-Fi – Gen 2 (~2014 – Current)

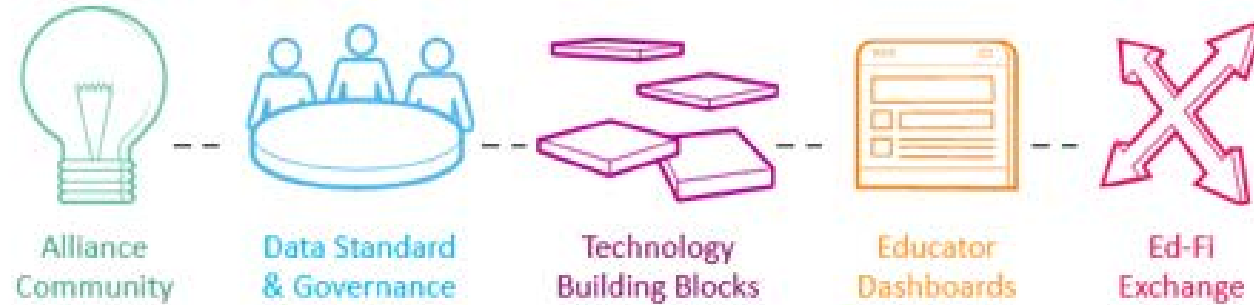


Ed-Fi – Gen 2 (~2014 – Current)



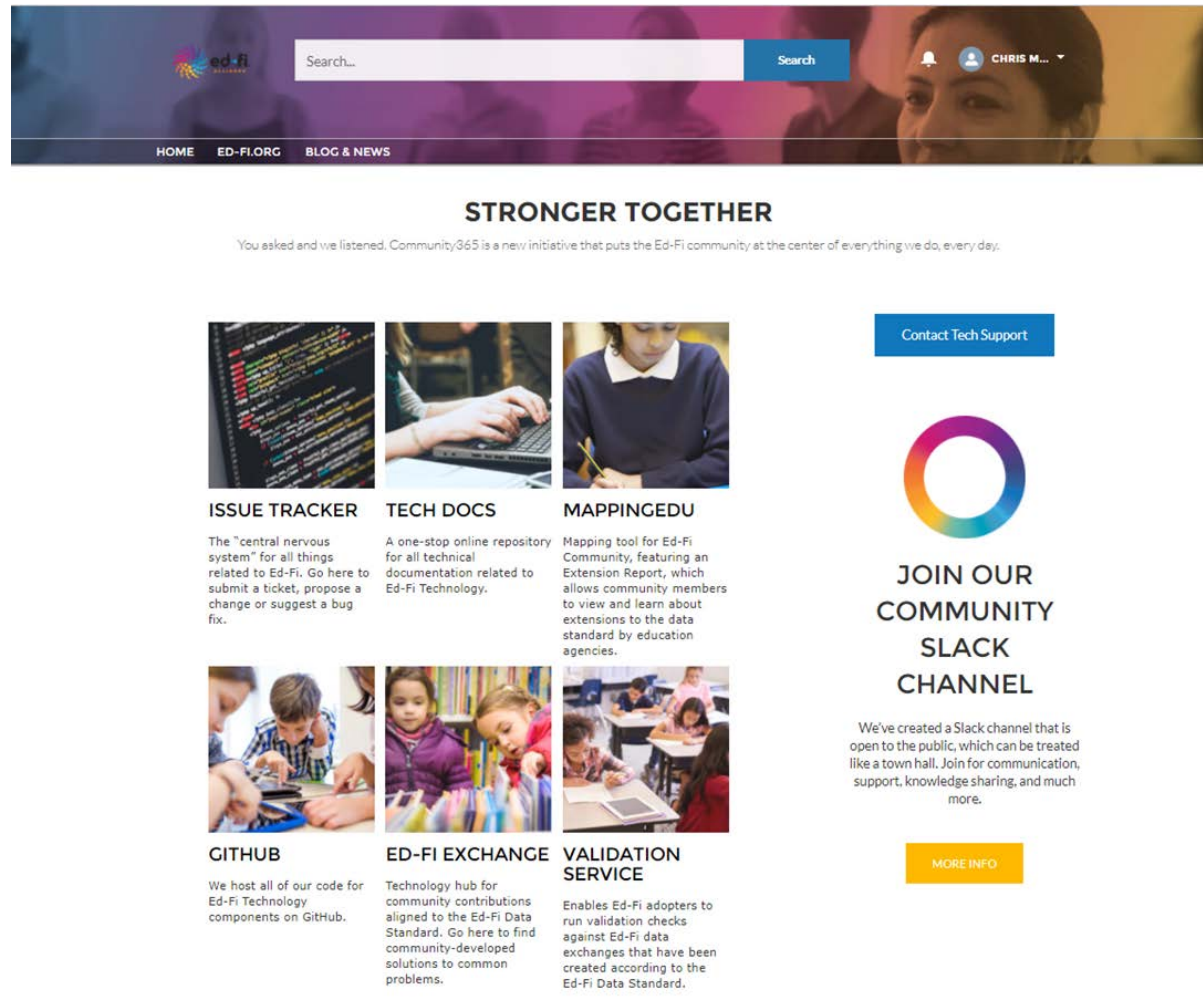
Ed-Fi – Gen 2 (~2014 – Current)

Organizing for scale



Ed-Fi – Gen 2 (~2014 – Current)

Organizing for scale



The screenshot shows the Ed-Fi Gen 2 website homepage. At the top is a navigation bar with the Ed-Fi logo, a search bar, and a user profile for 'CHRIS M...'. Below the navigation bar is a hero section with the heading 'STRONGER TOGETHER' and a subheading 'You asked and we listened. Community365 is a new initiative that puts the Ed-Fi community at the center of everything we do, every day.' The main content area is divided into two columns. The left column features six tiles: 'ISSUE TRACKER' (with a code editor image), 'TECH DOCS' (with a person typing image), 'MAPPEDU' (with a person writing image), 'GITHUB' (with a group of people image), 'ED-FI EXCHANGE' (with a child reading image), and 'VALIDATION SERVICE' (with a classroom image). The right column features a 'Contact Tech Support' button, the Ed-Fi logo, and a 'JOIN OUR COMMUNITY SLACK CHANNEL' section with a description of the Slack channel and a 'MORE INFO' button.

STRONGER TOGETHER

You asked and we listened. Community365 is a new initiative that puts the Ed-Fi community at the center of everything we do, every day.

ISSUE TRACKER

The "central nervous system" for all things related to Ed-Fi. Go here to submit a ticket, propose a change or suggest a bug fix.

TECH DOCS

A one-stop online repository for all technical documentation related to Ed-Fi Technology.

MAPPEDU

Mapping tool for Ed-Fi Community, featuring an Extension Report, which allows community members to view and learn about extensions to the data standard by education agencies.

GITHUB

We host all of our code for Ed-Fi Technology components on GitHub.

ED-FI EXCHANGE

Technology hub for community contributions aligned to the Ed-Fi Data Standard. Go here to find community-developed solutions to common problems.

VALIDATION SERVICE

Enables Ed-Fi adopters to run validation checks against Ed-Fi data exchanges that have been created according to the Ed-Fi Data Standard.

Contact Tech Support

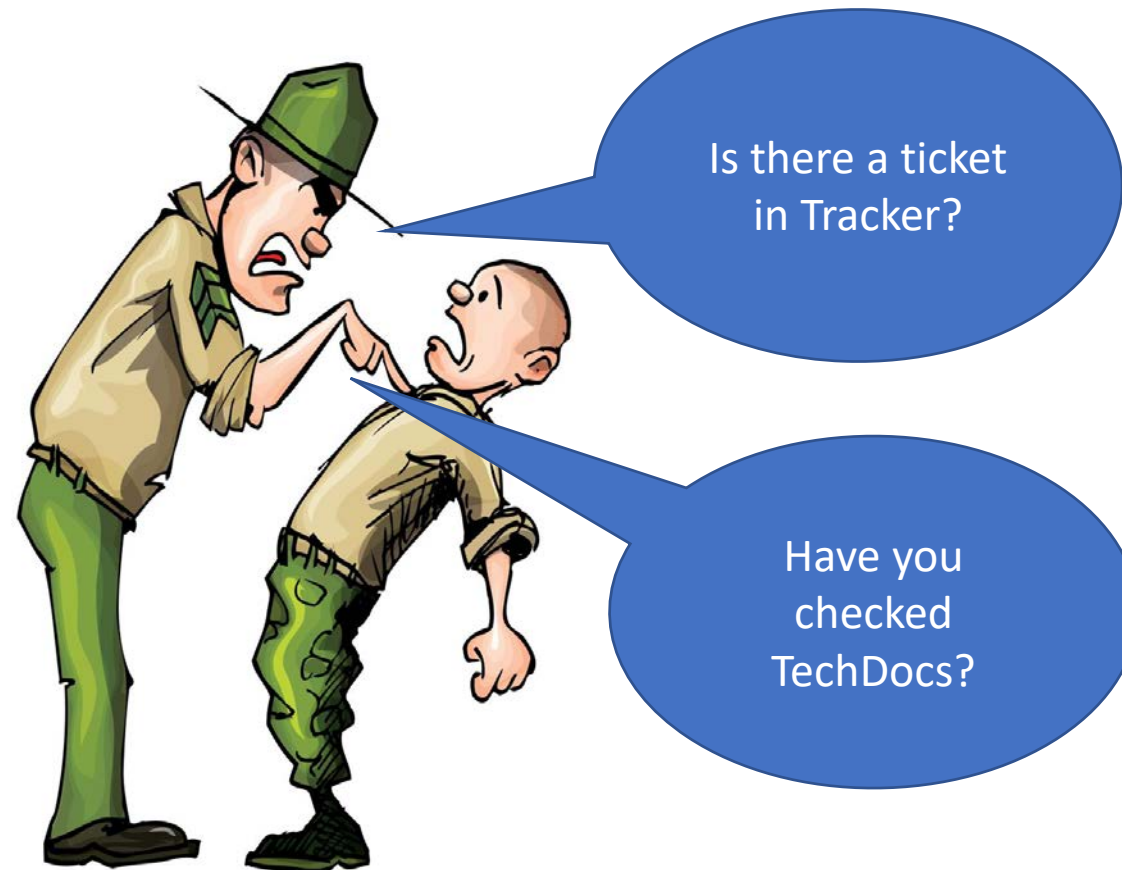
JOIN OUR COMMUNITY SLACK CHANNEL

We've created a Slack channel that is open to the public, which can be treated like a town hall. Join for communication, support, knowledge sharing, and much more.

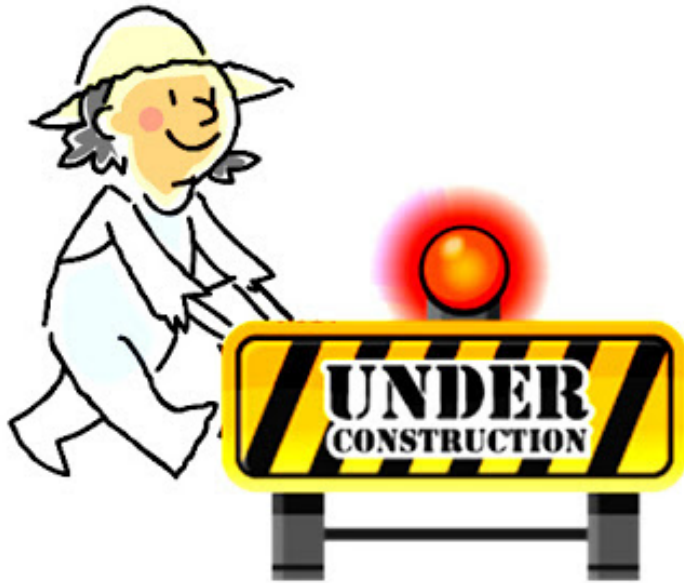
MORE INFO

Ed-Fi – Gen 2 (~2014 – Current)

Organizing for scale



Ed-Fi – Gen 3 (~ 2018 ...)



Under Construction

Key Ed-Fi Fundamentals - Across Generations

Timely collection,
exchange & availability
of granular data

Enable high-quality,
data-driven solutions →
empower educators and
yield better student
outcomes

Cost savings for states
and districts

And more...



Ed-Fi Technology - 101

Ed-Fi Technology 101 - Agenda

9:30 –
10:00

Data
Standard

10:00 –
10:30

Ed-Fi
ODS / API

10:30 –
11:00

BREAK

11:00 –
11:15

Ed-Fi
Dashboards

11:15 –
11:40

Ed-Fi Tools

11:40 –
12:00

Technology
Roadmap



Ed-Fi Technology - 101

Ed-Fi Data Standard

Eric Jansson

A standard makes complex systems run smoothly, coherently, and efficiently for all parties



Traffic lights and road signs



Bluetooth™



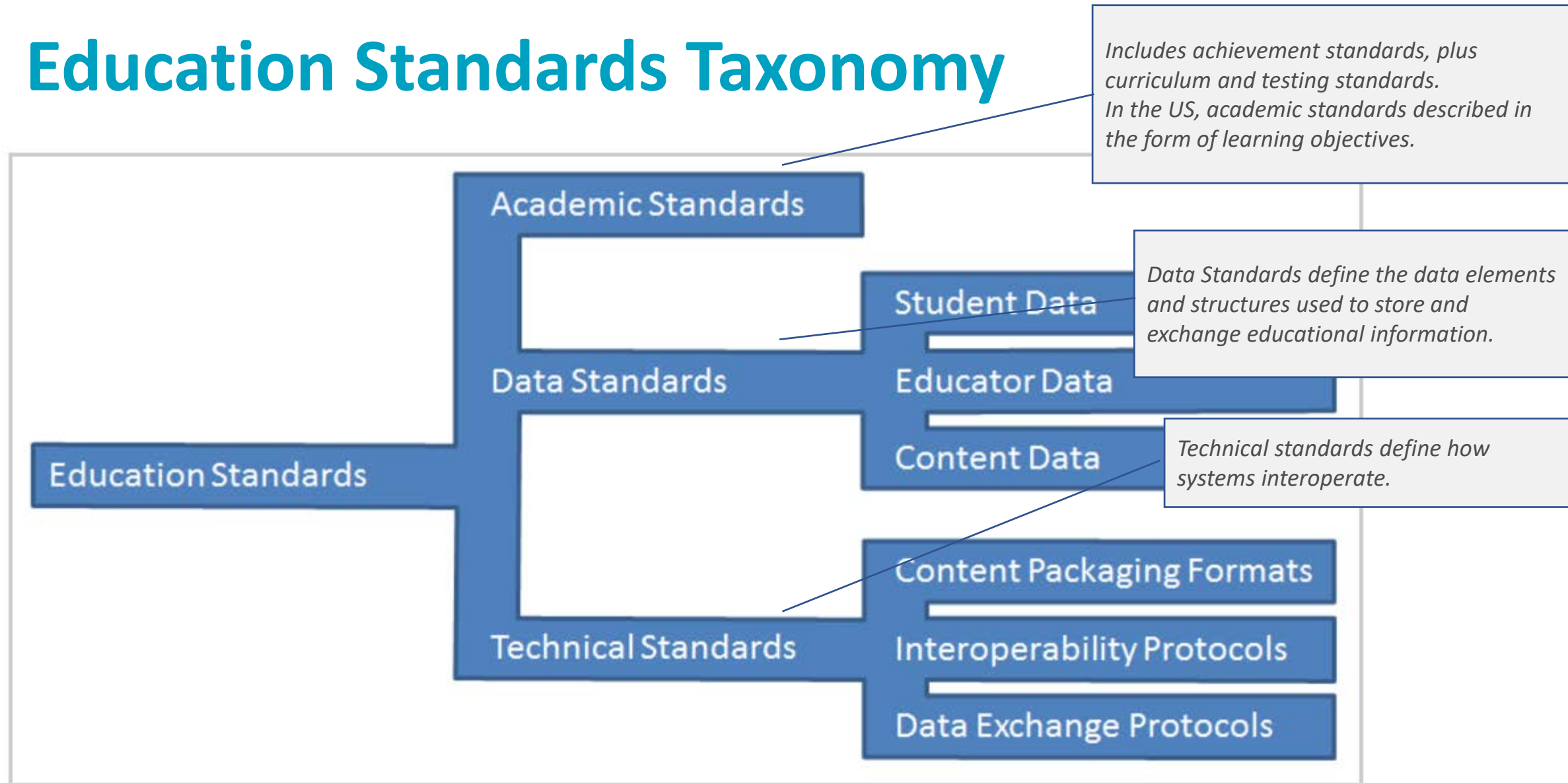
USB

What is a Standard?

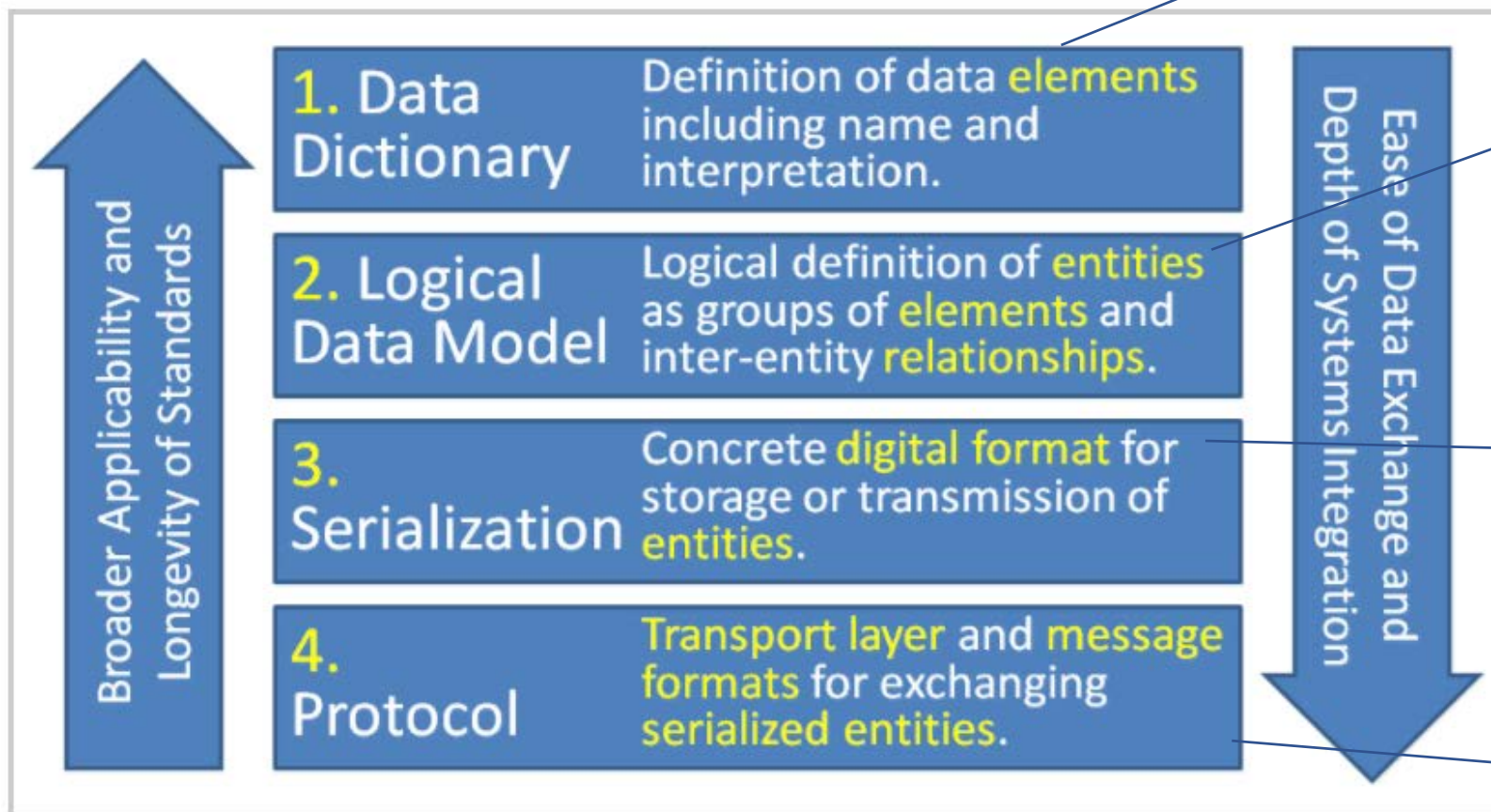
- A **technical standard** is an established **norm** or **requirement** in regard to technical systems
- Usually a **formal document** that establishes **uniform engineering or technical criteria, methods, processes and practices**
- May be developed privately or unilaterally (e.g., by a corporation, regulatory body, military, etc.)
 - Standards can also be developed by groups such as trade associations.
 - **Standards organizations** often have more diverse input and usually develop **voluntary** standards. These might become **mandatory** if adopted by a government (i.e. through legislation, business contracts, etc.)

https://en.wikipedia.org/wiki/Technical_standard

Education Standards Taxonomy



Data Standards – 4 Layer Framework



Example:

- Title: Birth Date
- Definition: Day the individual was born
- Format: year-month-day

Example:

- A student entity might include the properties (elements): name, birthdate, gender, address
- The student entity would have a many-many relationship with a Class entity

- 2 common frameworks for serializations are XML and JSON
- Conversion from a logical data model to a particular serialization is not automatic – and needs a specification of exactly how a data model is rendered into a particular serialization

- Typical transport layers include Messaging (REST, SOAP, ESB), Transport (HTTP or FTP), and Network (e.g. TCP/IP)
- At this level, “out-of-the-box” interoperability between conforming applications is enabled.

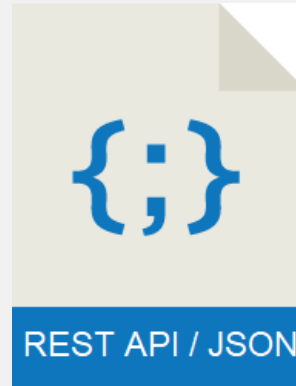
<http://www.ofthat.com/2012/10/ceds-and-four-layer-framework-for-data.html>

Ed-Fi Standards Components

IMPLEMENTATION

REST API Specifications

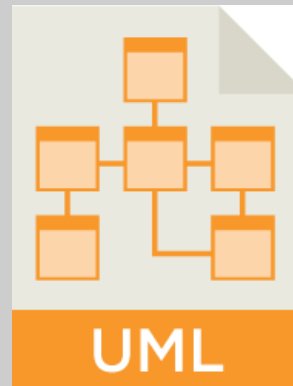
- Deal with specific use cases
- Defined in Open API and normative guidelines
- Data modeled in JSON



XML (Bulk) Specifications

- Deal with specific use cases
- Defined in XSD
- Data in transit is in XML

FOUNDATION



Ed-Fi Unifying Data Model

- A logical model in UML and a Data Handbook
- The foundation of all Ed-Fi technical standards
- Ensures that all standards are compatible

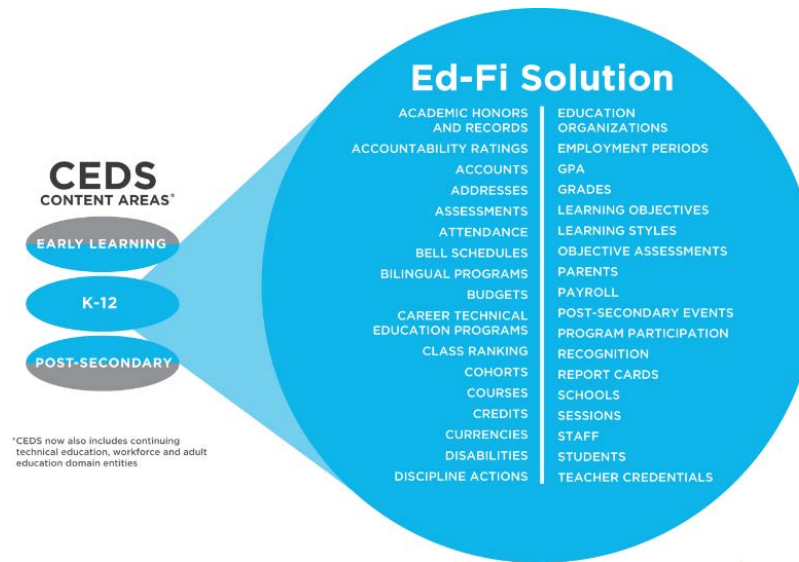
UDM Goals and Domains

GOALS

- Define data related to student performance to help drive decisions to improve student performance
 - Includes some ancillary domains indirectly related to student performance (staff credentials, etc.)

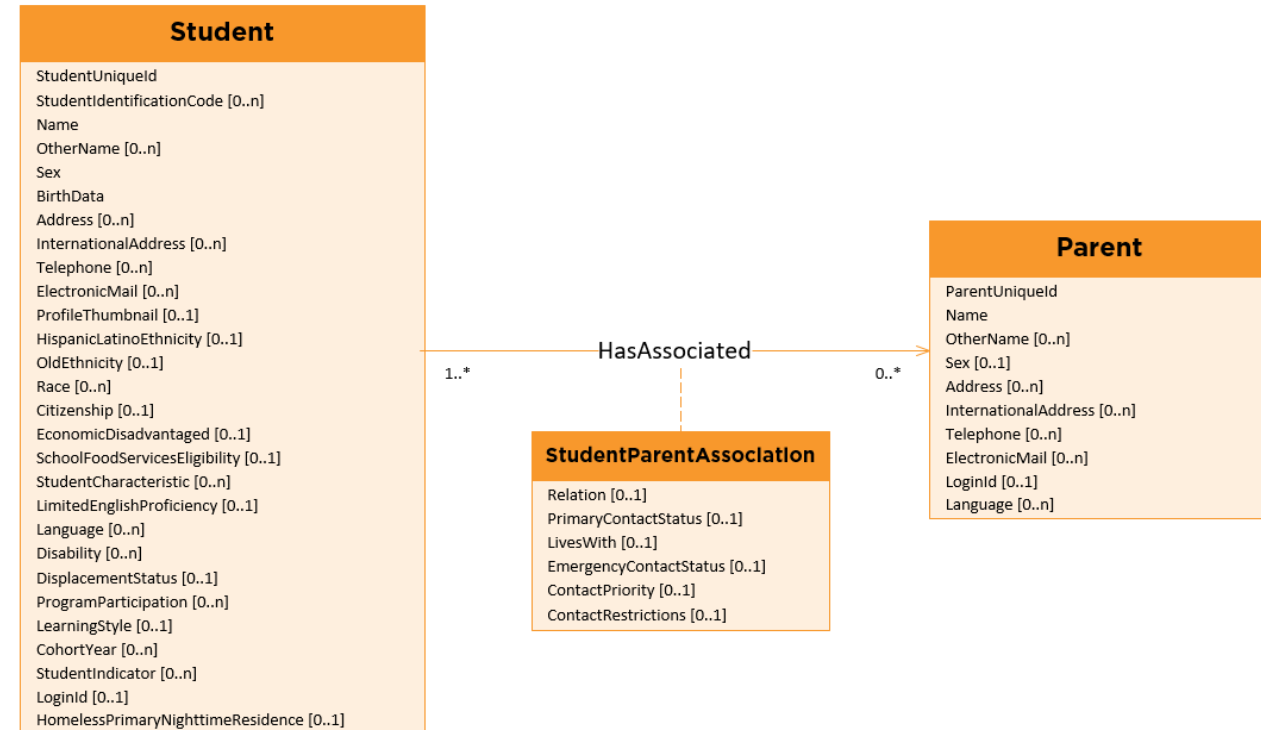
DOMAINS

- Alternative/Supplemental Services
- Assessment
- Bell Schedule
- Discipline
- Education Organization
- Enrollment
- Finance
- Graduation
- Intervention
- School Calendar
- Staff
- Student Academic Record
- Student Attendance
- Student Cohort
- Student Identification and Demographics
- Teaching and Learning



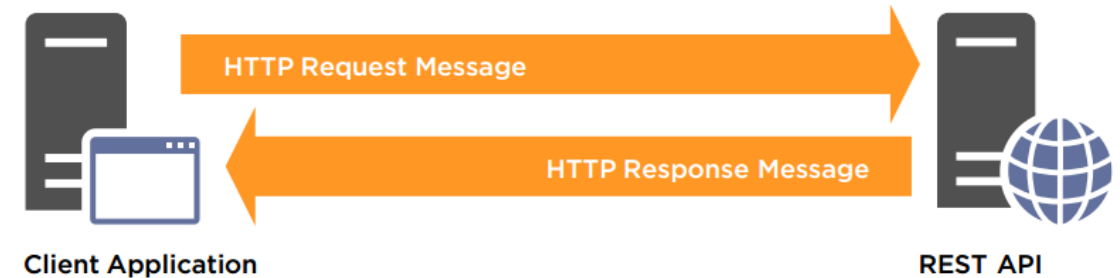
Unifying Data Model (UDM)

- UDM sometimes referred to as the “Ed-Fi Data Standard”
- Made up of entities, attributes and associations
- Highly normalized - optimized for storage of very granular data
- Available in [UML in Github](#) (all versions) and via [Data Handbook](#) (v2.1+)
- Versions
 - Main version in use in 2.0
 - Next version proposed for implementation is 2.1 (could change: watch [RFCs](#) and [Data Standard space in TechDocs](#))



Ed-Fi API Specifications

- Define Application Programming Interfaces (APIs) for movement of data
- Follow REST(ful) conventions
 - HTTP using verbs GET, POST, PUT, DELETE
- Versions
 - Ed-Fi ODS API is the de facto API standard, but Open API-based specification coming soon
 - Watch [Request for Comments](#)



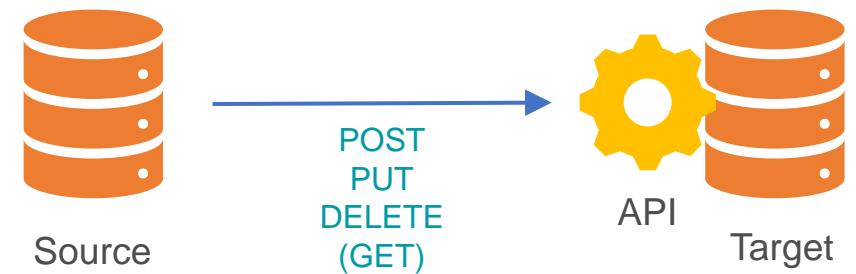
```
GET /sections/FCYW5-UYK32-8YTQ7
```

```
{
  "schoolId":12345,
  "classPeriodName":"4th Period",
  "classroomIdentificationCode":"abcde",
  "localCourseCode":"Math 101",
  "termTypeId":1,
  "schoolYear":2012,
  "uniqueSectionCode":"3FJ56",
  "sequenceOfCourse":1,
  "availableCredit":1.5
}
```

API Configurations - Different Use Cases

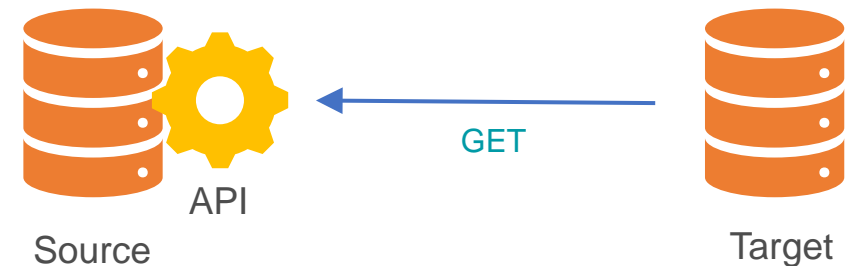
Data Management API

- Target system must implement the API
- Source system responsible for synchronizing
- Typical for use cases involving transactional, near-real-time updates



Data Access API

- Source system must implement the API
- Target system calls the API
- Typical for use cases needing periodic or on-demand synchronization
- For Ed-Fi a subset of these APIs are called “composite” APIs as they “compose” multiple entities into one



XML (Bulk) Specifications

- Designed for moving large amounts of data in a bulk format
- Two parts
 - **Core XML Schema Definition (XSD):** defines all entities, attributes and associations
 - **Interchange Schemas:** defines how entities are packaged (into use-case-based bundles)

```
<xs:complexType name="Student">
  <xs:annotation>
    <xs:documentation>This entity represents an individual for whom
instruction, services, and/or care are provided in an early childhood,
elementary, or secondary educational program under the jurisdiction of a
school, education agency or other institution or program. A student is a
person who has been enrolled in a school or other educational institution.</
xs:documentation>
    <xs:appinfo>
      <ann:TypeGroup>Domain Entity</ann:TypeGroup>
      <ann:EdFiId>585</ann:EdFiId>
    </xs:appinfo>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="ComplexObjectType">
      <xs:sequence>
        <xs:element name="StudentUniqueId" type="UniqueId">
          <xs:annotation>
            <xs:documentation>A unique alphanumeric code
assigned to a student.</xs:documentation>
            <xs:appinfo>
              <ann:EdFiId>1705</ann:EdFiId>
            </xs:appinfo>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

API vs Bulk Capabilities

API	Bulk
JSON	XML
Synchronous responses	Asynchronous responses
Near real-time as data is changing in the source application	For initial load or periodic refreshes
Full CRUD for data writes	Upsert (Create and Update) only
Create and retrieve UniqueIds	No ability to create and retrieve UniqueIds

Stuff that is NOT a Standard

- No relational database model: the Ed-Fi ODS is a physical implementation of the UDM, but it is not a standard per se
- Ed-Fi standards don't focus on data **at rest**, but data **in transit**!



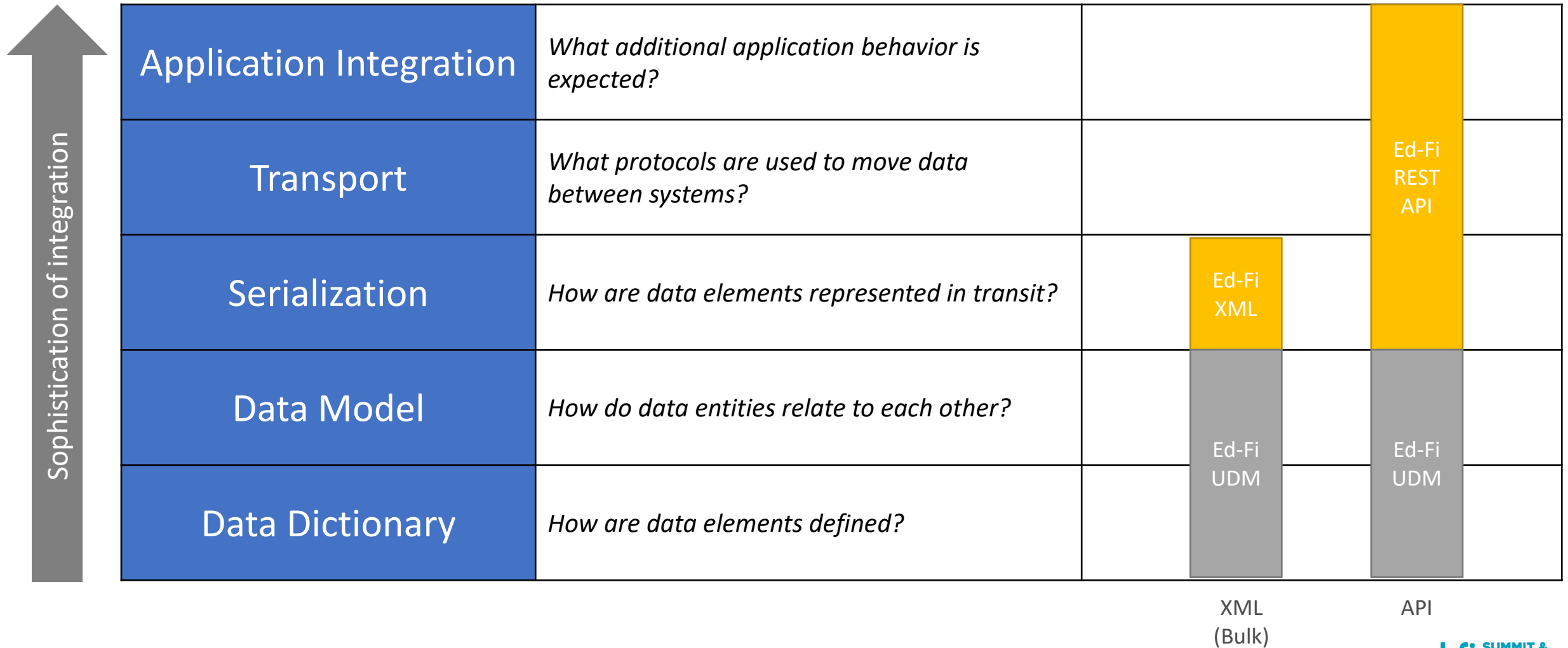
Extensibility

- Ed-Fi's standards are extensible, meaning that individual stakeholders can add new entities, attributes and associations*
- Extensibility is the opposite of standardization, so why support it?
 - K12 is full of diverse data mandates and no single standard can capture this diversity
 - Extensibility allows the community to try new models and exchanges, which can grow the standards
- Extensibility is a power and also a responsibility
 - It **should not** be used to duplicate existing data elements
 - It **should not** be used to aggregate existing granular data already in the model
 - It **should** be done by consulting community on possible existing extensions (see tools discussion)



** Note: under the next generation of Ed-Fi standards and technology, these extensions will always be explicitly in the extending organization's namespace to help prevent confusion!*

Interoperability Standards and Ed-Fi



Where is this Stuff?

- **Source files** are on [GitHub](#)
 - UML diagrams, in Visio (v2.0+) and .ea files (v2.0 and prior)
 - XSD bindings
 - OpenAPI format (forthcoming!)
 - Sample data (in Ed-Fi XML)
- **How-to's** and **documentation** are on [TechDocs](#)
- **Suggestions** and **issues** are reported on [Tracker](#)
 - Don't expect an immediate solution – this isn't like fixing a software bug! Think of this as being like planting an acorn.



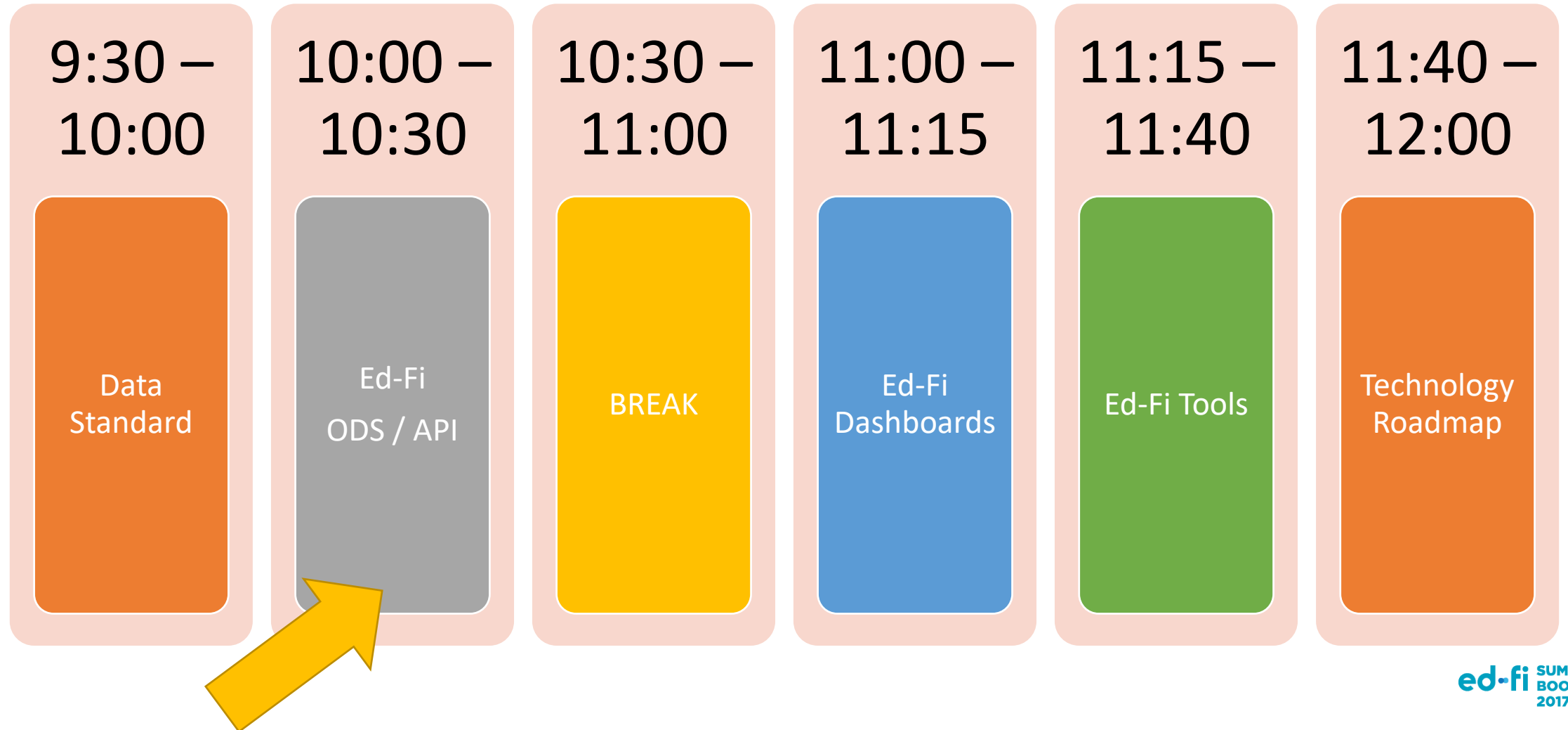
You will often interact with data standard concepts through implementation artifacts (e.g. database schemas, Swagger, etc.), but don't overlook them as an aid for insomnia!

Data Standards – Wrap Up

Day / Time	Theme	Session Title	Presenter(s)	Synopsis
Day 1 8:30 – 9:00	Arrival & Breakfast			
9:00 – 12:00	101-level overview of Ed-Fi Technology	Ed-Fi Technology – 101 (101)	Chris Moffatt Eric Jansson Cy Jones Shannon Kerlick	The focus will be on providing an overview of the full suite of Ed-Fi technology (current on forthcoming), with reference to where in-depth topics will be addressed in the follow-on sessions in the boot camp.
	Lunch			
1:00 – 5:00	200-level tracks, with focus on user-centric implementation scenarios	SEA Implementations (201)	Sayee Srinivasan Ben Meyers (DLP) Michael Taylor (Indiana U)	SEA (and regional) use cases, centered around Ed-Fi “Enterprise ODS”, with in-depth focus on deployment, security.
		LEA Implementations (202)	Shannon Kerlick Jamie Martinez (Volusia) Curtis Lee (JeffCo)	Understanding and accessing the Ed-Fi data model (through API and data marts), using the Cloud ODS
		Vendors (203)	Cy Jones Vinaya Mayya Geoff McElhanon (Certica)	In-depth focus on the Ed-Fi API’s, from client application perspective (data management API’s, profiles, composites) & implementing Ed-Fi aligned API’s.
Day 2 8:30 – 9:00	Breakfast			
Day 2 9:00 – 12:00	200-level tracks, with focus on advanced technology topics	Ed-Fi Tools – MetaEd & MappingEdu (204)	Eric Jansson Sayee Srinivasan Brad Banister (DLP)	Using MetaEd IDE & MappingEdu to work with the data standard.
		Ed-Fi ODS / API – New Capabilities (205)	Chris Moffatt Geoff McElhanon (Certica)	Topics will include ODS/API v3.0 and the Temporal ODS.
		Analytics and Visualizations (206)	Cy Jones Dan Malagari (Headspring)	Accessing Ed-Fi data for analytics and visualizations using Ed-Fi Dashboards & Commercial off the shelf solutions.



Ed-Fi Technology 101 - Agenda





Ed-Fi Technology - 101

Ed-Fi Operational Data Store & API

Chris Moffatt

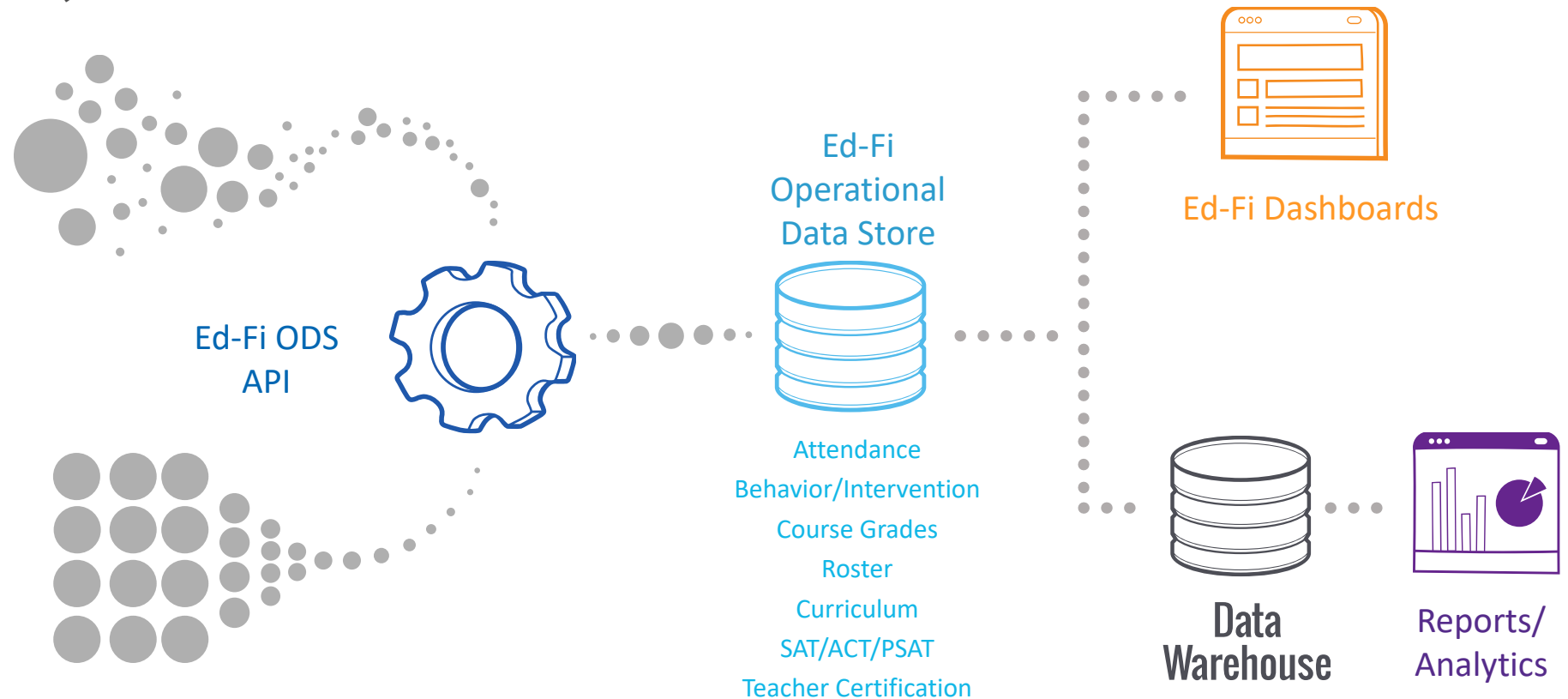
Ed-Fi Operational Data Store & API

Transactional Data (JSON)

- SIS/LMS
- Content Management
- Instructional Apps
- Financial/HR
- Operations (food, transport, library)

Bulk Data (XML)

- State Assessments
- National Assessments
- Other?



Platform Fundamentals

An Open Source, Customizable System

- The Ed-Fi ODS / API is a highly customizable system
- The source code distribution has a complete set of features and can easily be set up to run on a development machine or test environment
- Some analysis, planning, and development work are required to put the complete system into production for an enterprise

Made to be Secure

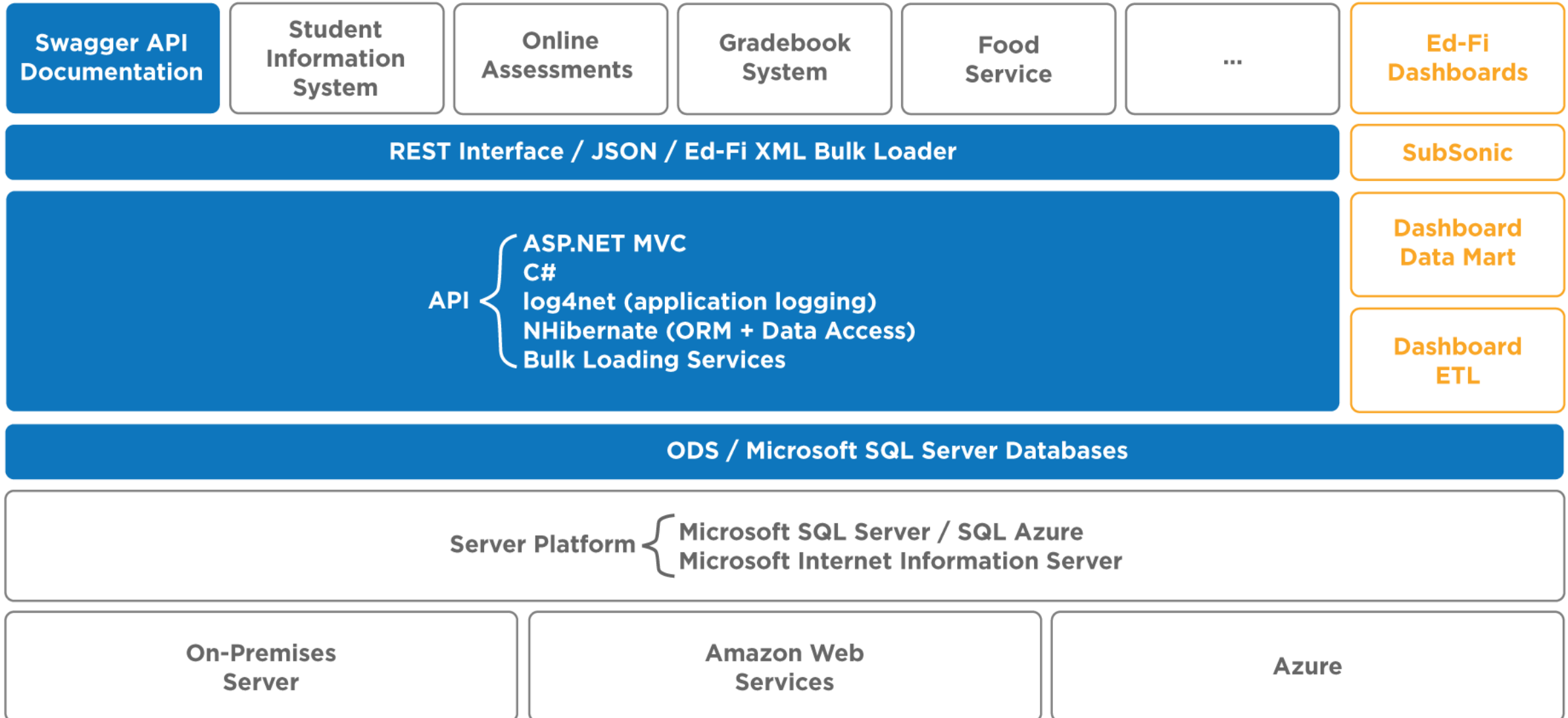
Made to be Extended

Code Generation Wherever Possible

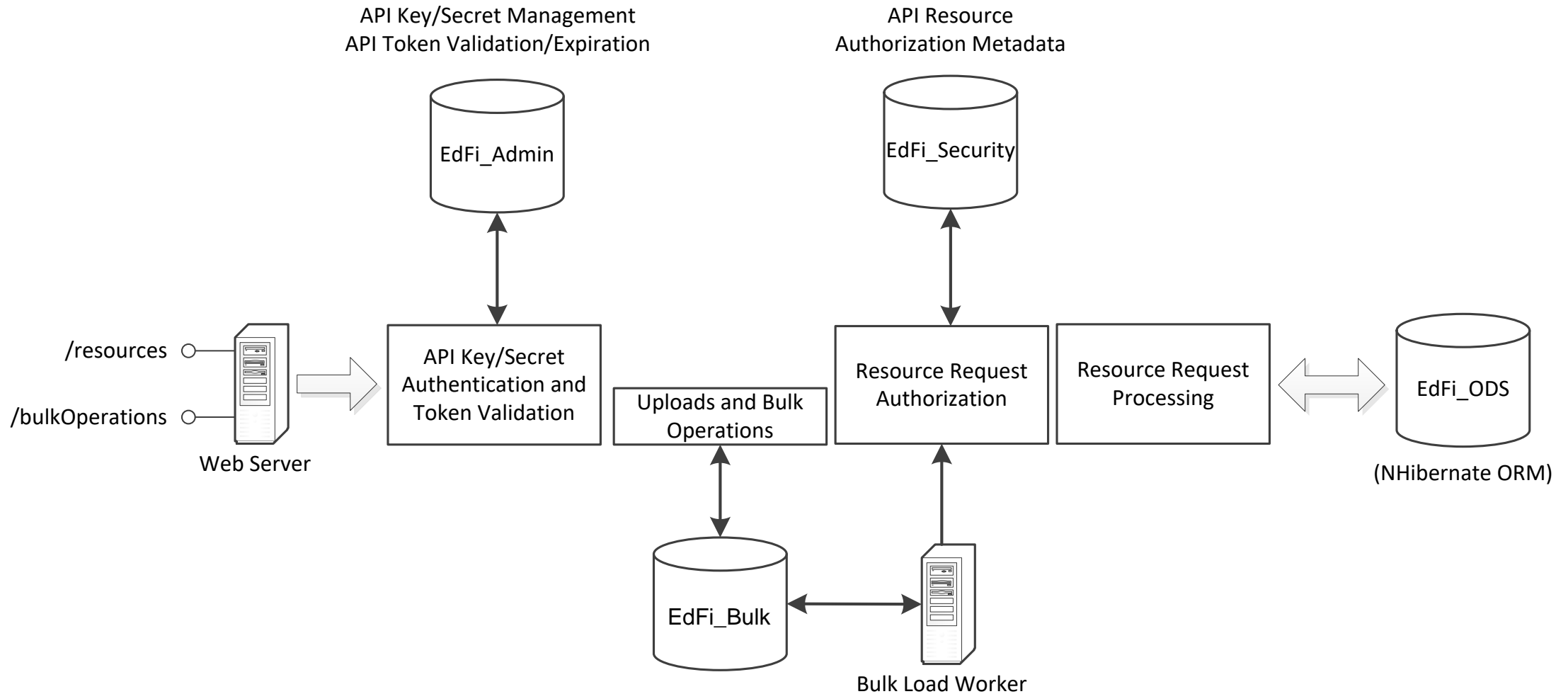
Built for Agile Development and Continuous Integration

Support for Transactional & Bulk Modes

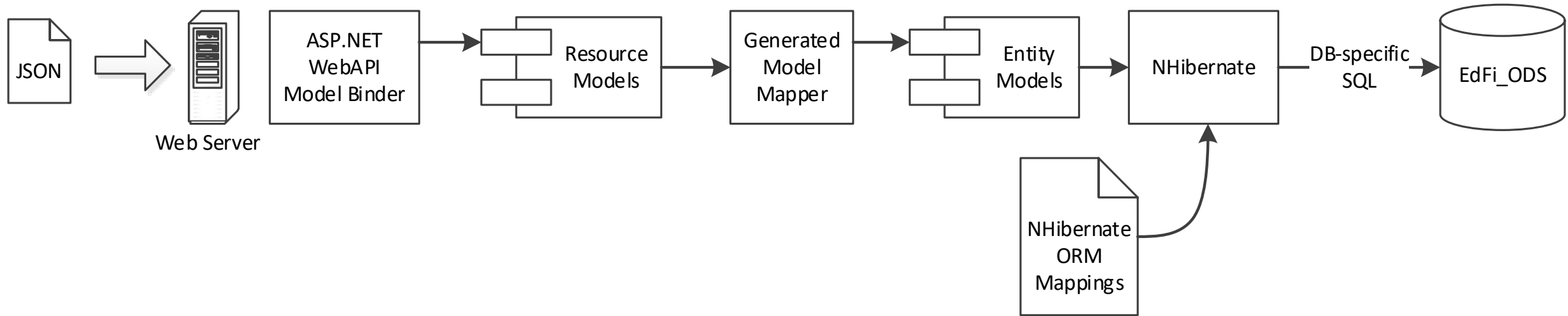
Technology Stack



Architecture



Architecture



When the ASP.NET WebAPI framework receives the JSON payload, it is deserialized into the C# Resource class model. The data is then copied to the Entity model which matches the structure of the ODS database

Platform Fundamentals

An Open Source, Customizable System

Made to be Secure

- Built from the ground up to provide developers and agencies with a solution to keep data secure and private
- Regular external security audits – in addition to development best practices

Made to be Extended

Code Generation Wherever Possible

Built for Agile Development and Continuous Integration

Support for Transactional & Bulk Modes

Platform Fundamentals

An Open Source, Customizable System

Made to be Secure

Made to be Extended

- Out of the box, the ODS / API core data model covers a wide swath of information related to the K–12 domain, with a focus on student achievement.
- The data model is easily* extended to handle information specific to your environment -> MetaEd IDE

Code Generation Wherever Possible

Built for Agile Development and Continuous Integration

Support for Transactional & Bulk Modes

Platform Fundamentals

An Open Source, Customizable System

Made to be Secure

Made to be Extended

Code Generation Wherever Possible

- Much of the data access code and API surface have architectural patterns defined, so the ODS / API leverages code generation techniques throughout the system
- MetaEd generates core artifacts - e.g. SQL Schema, Bulk XSD's, API Sematic Model (coming soon)

Built for Agile Development and Continuous Integration

Support for Transactional & Bulk Modes

Platform Fundamentals

An Open Source, Customizable System

Made to be Secure

Made to be Extended

Code Generation Wherever Possible

Built for Agile Development and Continuous Integration

- The solution ships with unit tests and integration tests that provide assurance that the system functions as intended.
- Under Agile development methodologies, code introduced to fix existing issues or provide new features should have accompanying test coverage, and should not break any pre-existing tests
- “Some assembly required” for deployments beyond developer machine. See [Platform Dev. Guide - Deployment](#)

Support for Transactional & Bulk Modes

Platform Fundamentals

An Open Source, Customizable System

Made to be Secure

Made to be Extended

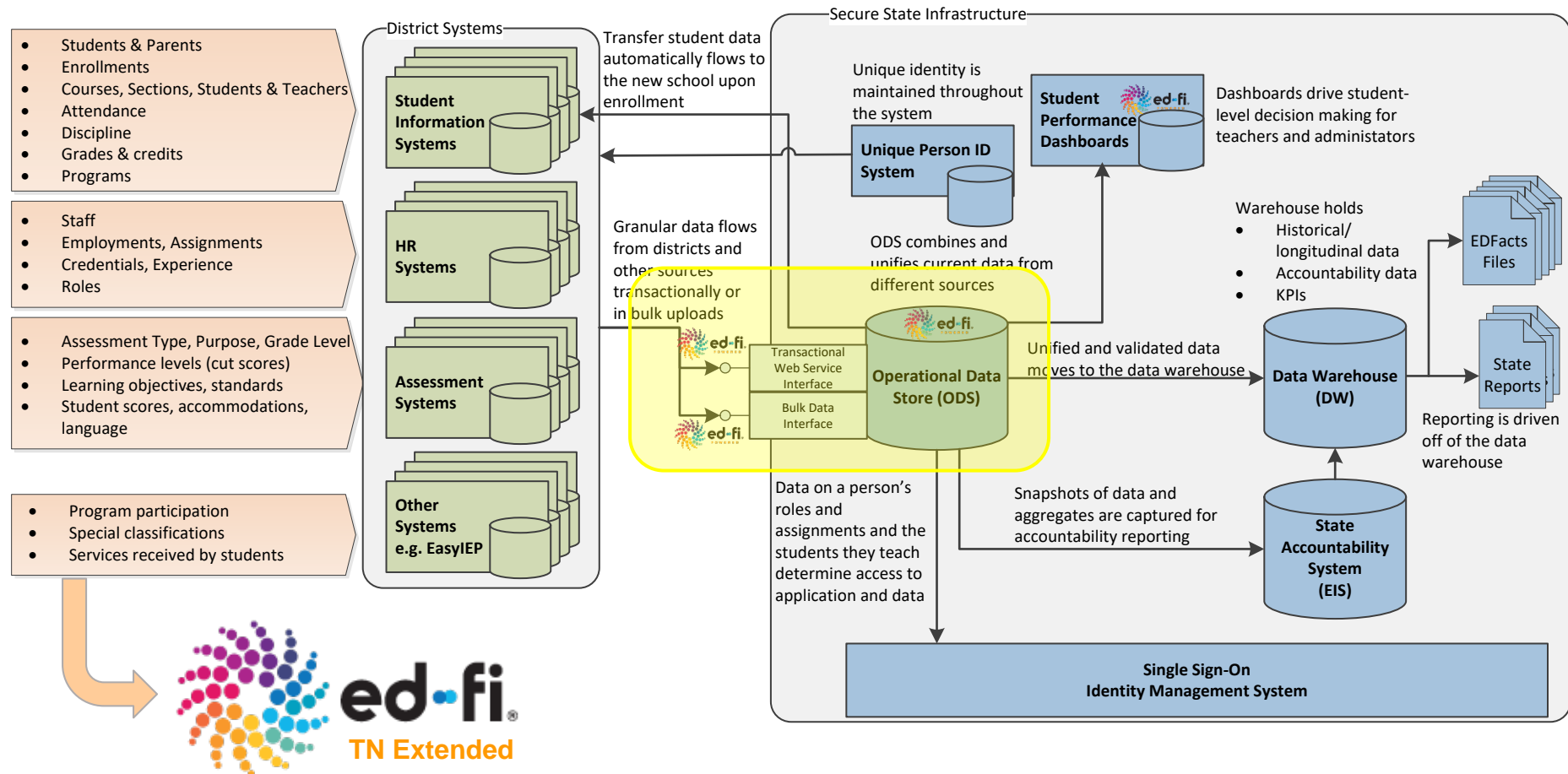
Code Generation Wherever Possible

Built for Agile Development and Continuous Integration

Support for Transactional & Bulk Modes

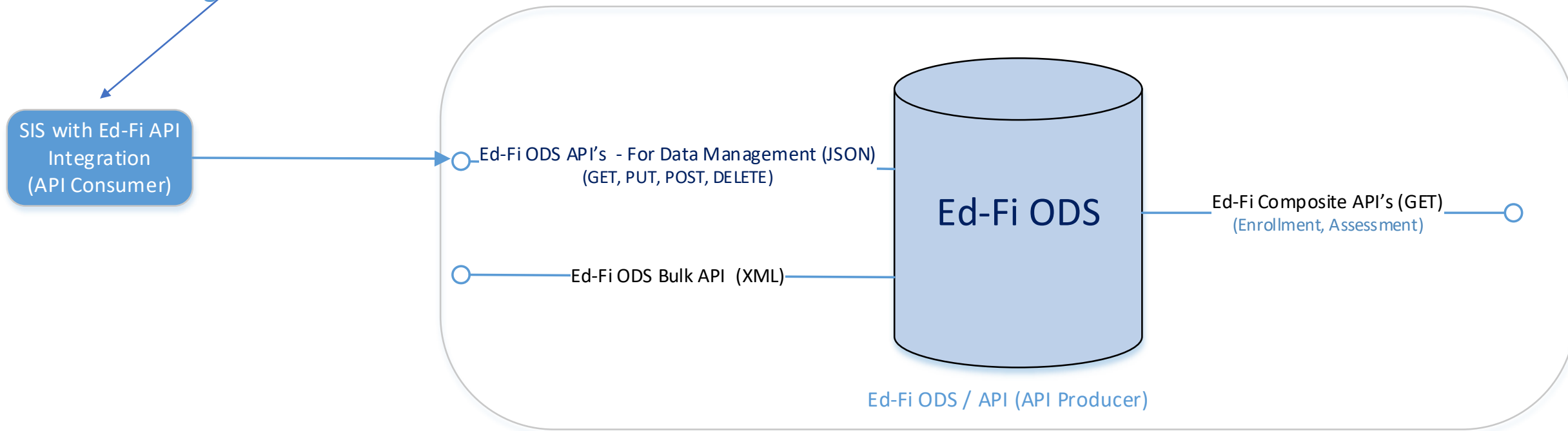
- Bulk loading is useful for initial loading of data and solutions where data is updated in batches (e.g., for organizations that feed data on a nightly schedule)
- A transactional model is useful once you have data in the system. Individual records and fields can be updated in real-time (or near real-time) by client applications

Ed-Fi ODS / API in Field Implementations



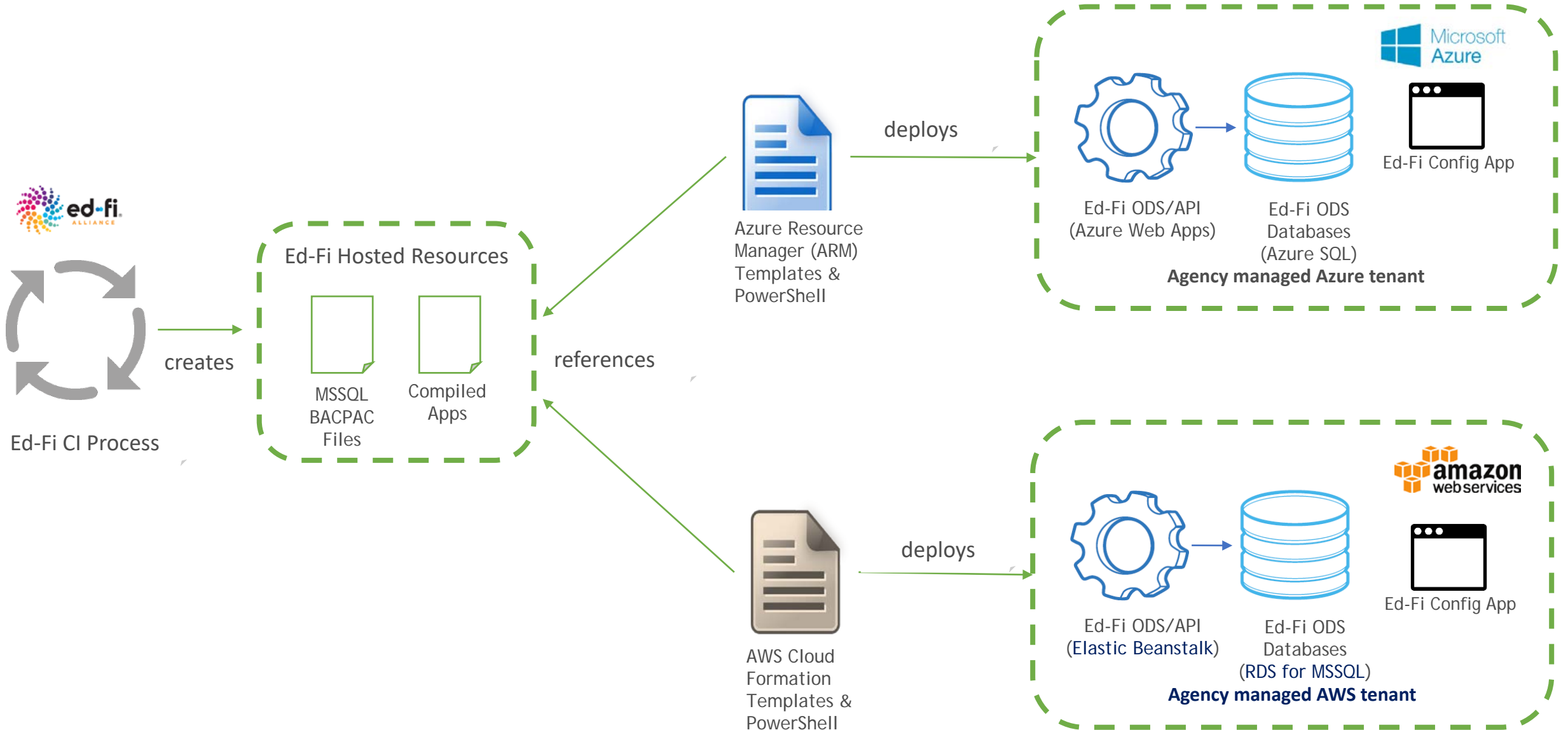
Ed-Fi ODS / API – Example Data Flow

Current Ed-Fi Certification - Student Information Systems for ODS / API v2 Certification – certifies SIS's that call the Ed-Fi ODS Data Management API's



Ed-Fi Cloud ODS / API

Ed-Fi ODS/API in Cloud Deployments



Enterprise ODS/API – Implementation Steps

1. Get Started with ODS / API (1 -5 days)

- Ensure you have access to .Net developer resources (agency or Systems Integrator)
- Following “Getting Started” instructions and pulling source code
- Get solution up and running on a developer machine

2. ODS / API - Dev Ops (Days - Weeks)

- Build out development and deployment infrastructures
- Continuous integration: development -> staging -> production sites

3. ODS / API - Extensions & Customizations (Weeks – Months)

- Determine requirements for extensions – MappingEdu
- Develop, integrate extensions into solution – MetaEd
- Customize if needed – e.g. SEA-specific Identity integration, additional data validation - .Net, c#

4. ODS / API Source System Integration (1 day – 1 year)

- API Client’s integrate with the ODS / API → Leverage Ed-Fi-certified SIS’s
- ETL/bulk for “long tail” data sources

5. Downstream Use Cases (Days - Months)

- Analytics, Reporting, Data Exchange, etc.

6. Test, Deploy, Maintain, Upgrade (Ongoing)

- Simple security config tool
- Lots of scripts, developer time

Cloud ODS / API - Differentiation

1. Get Started with ODS / API (1-5 days)

- ~~Ensure you have access to .Net developer resources (agency or Systems Integrator)~~
- ~~Following “Getting Started” instructions and pulling source code~~
- ~~Get solution up and running on a developer machine~~

2. ODS / API - Dev Ops (Days - Weeks)

- ~~Build out development and deployment infrastructures~~
- ~~Continuous integration: development → staging → production sites~~

3. ODS / API - Extensions & Customizations (Weeks - Months)

- ~~Determine requirements for extensions – MappingEdu~~
- ~~Develop, integrate extensions into solution – MetaEd~~
- ~~Customize if needed – e.g. State-specific Identity integration, additional data validation – .Net, c#~~

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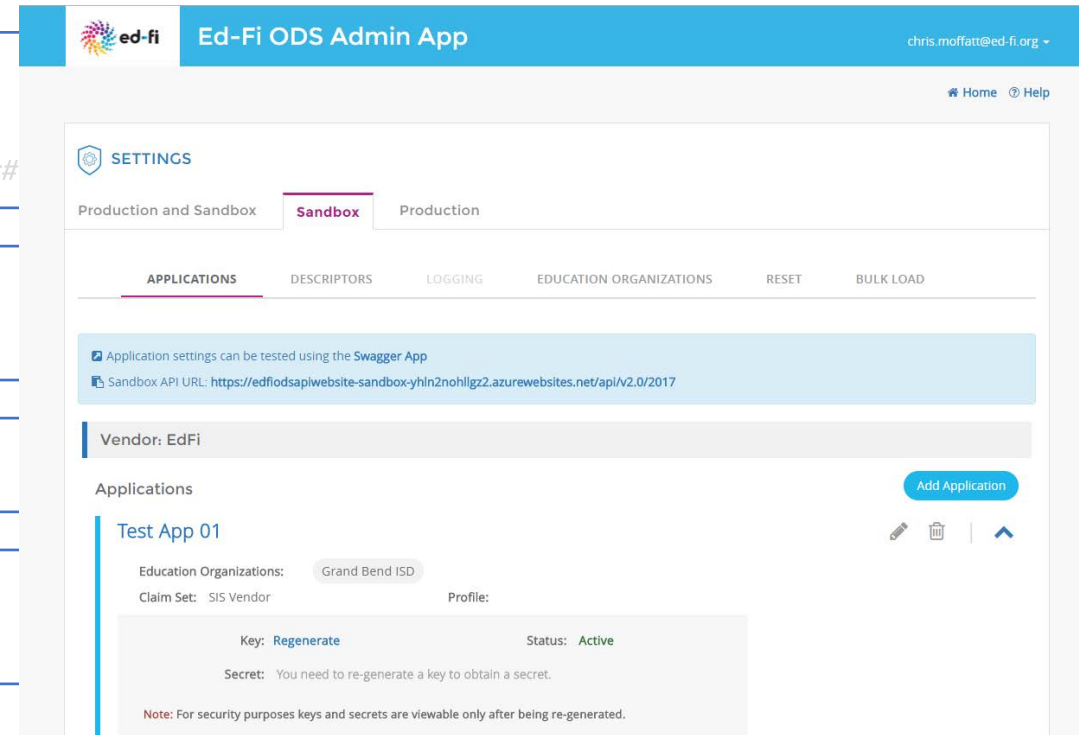
5. Downstream Use Cases (Days - Months)

- Analytics, Reporting, Data Exchange, etc.

6. Test, Deploy, Maintain, Upgrade (Ongoing)

- Simple security config tool >> **ODS Admin App – improved management capabilities**
- Lots of scripts, developer time >> **reduced script, manual work**

*ODS/API core artifacts -
deployed into
customers public cloud
tenancy in < 30 mins*



ODS/API – Product Differentiation

Enterprise ODS / API

- Starts with source code and documentation
- Highly extensible and customizable
- Set up and deployment investment is significant, and requires significant developer expertise - usually requiring Systems Integrator
- Upgrade and migration complexity – a trade-off w/ extensible and customizable

Cloud ODS / API

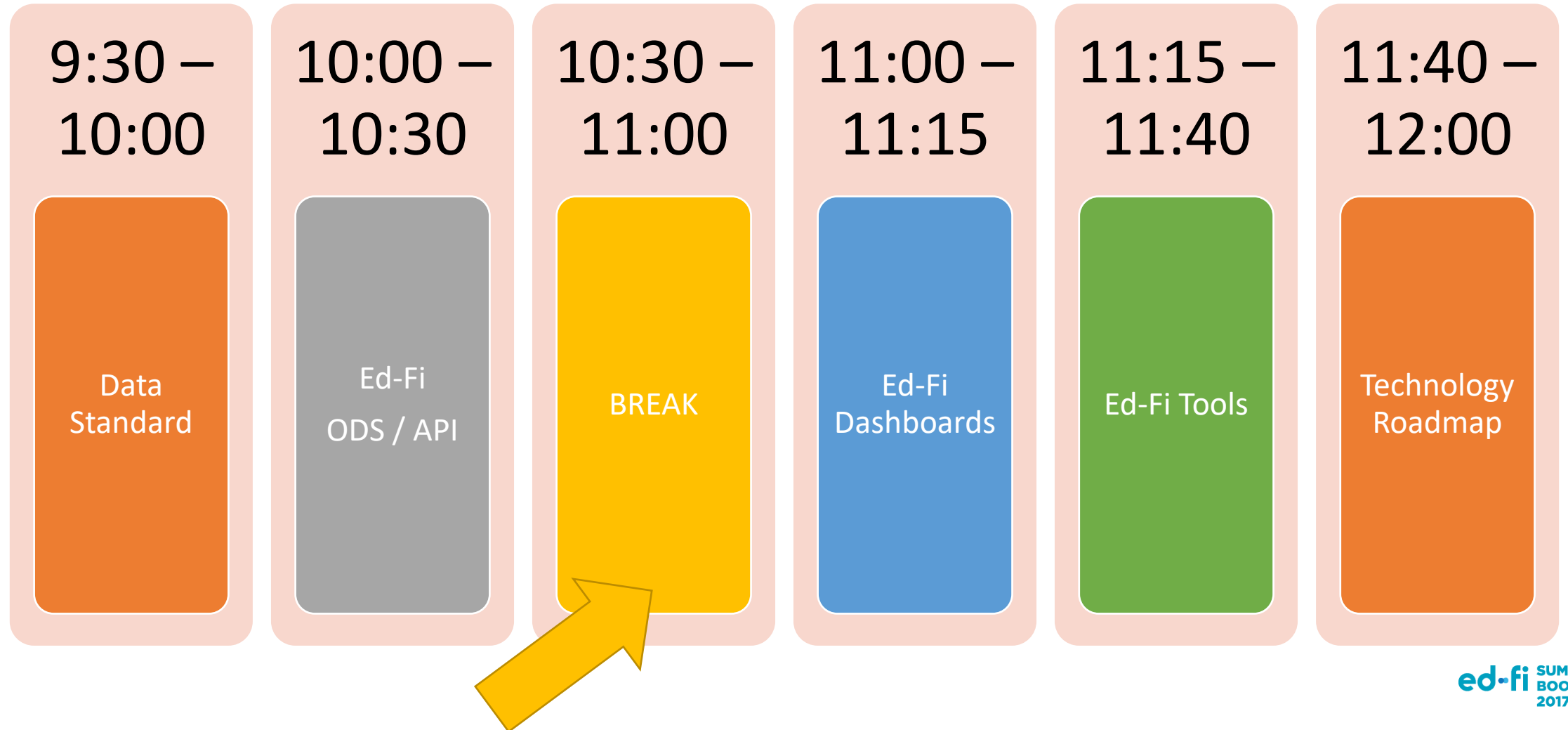
- Set up in < 30 mins – for a “core experience”
- v1.0 RC offers simplified “core” experience
 - Improved manageability
 - Not extensible (out of the box)
 - Lightweight bulk load support
 - Upgrade and migration support

Ed-Fi ODS / API – Wrap Up

Day / Time	Theme	Session Title	Presenter(s)	Synopsis
Day 1 8:30 – 9:00	Arrival & Breakfast			
9:00 – 12:00	101-level overview of Ed-Fi Technology	Ed-Fi Technology – 101 (101)	Chris Moffatt Eric Jansson Cy Jones Shannon Kerlick	The focus will be on providing an overview of the full suite of Ed-Fi technology (current on forthcoming), with reference to where in-depth topics will be addressed in the follow-on sessions in the boot camp.
	Lunch			
1:00 – 5:00	200-level tracks, with focus on user-centric implementation scenarios	SEA Implementations (201)	Sayee Srinivasan Ben Meyers (DLP) Michael Taylor (Indiana U)	SEA (and regional) use cases, centered around Ed-Fi “Enterprise ODS”, with in-depth focus on deployment, security.
		LEA Implementations (202)	Shannon Kerlick Jamie Martinez (Volusia) Curtis Lee (JeffCo)	Understanding and accessing the Ed-Fi data model (through API and data marts), using the Cloud ODS
		Vendors (203)	Cy Jones Vinaya Mayya Geoff McElhanon (Certica)	In-depth focus on the Ed-Fi API’s, from client application perspective (data management API’s, profiles, composites) & implementing Ed-Fi aligned API’s.
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Ed-Fi Technology 101 - Agenda



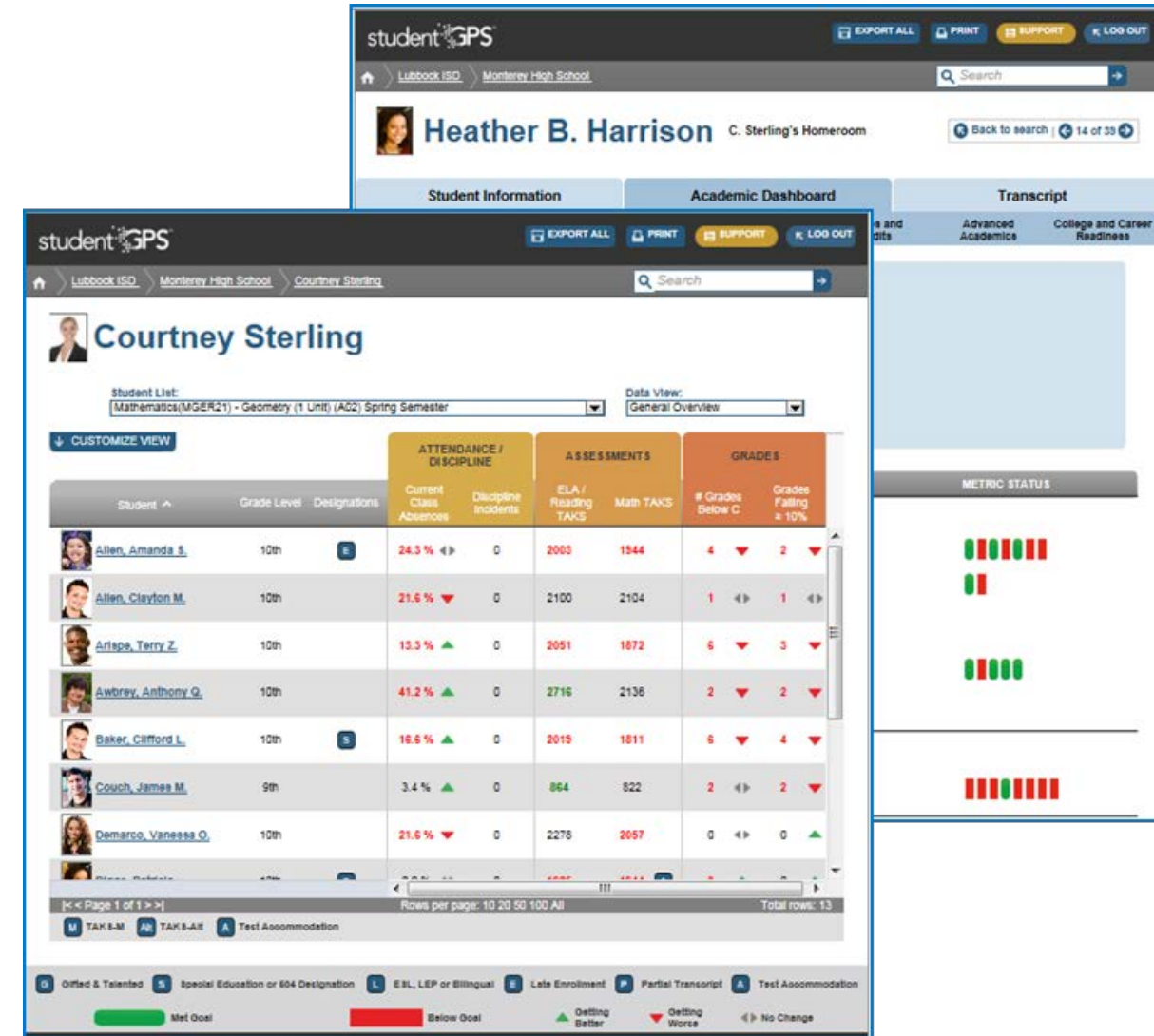


Ed-Fi Technology -101 Ed-Fi Dashboards (& COTS Visualizations)

Cy Jones

Ed-Fi Dashboards

- Single source of interval refreshed data
- Replaces hunting for information in multiple paper, electronic files, & separate systems
- Comprehensive data set that starts with student and rolls up to classroom, school, and district view
- Vetted and used by thousands of educators
- [Metrics](#) grounded in research.
- Demo information available on the [Quick Start User Guide](#) page in TechDocs.

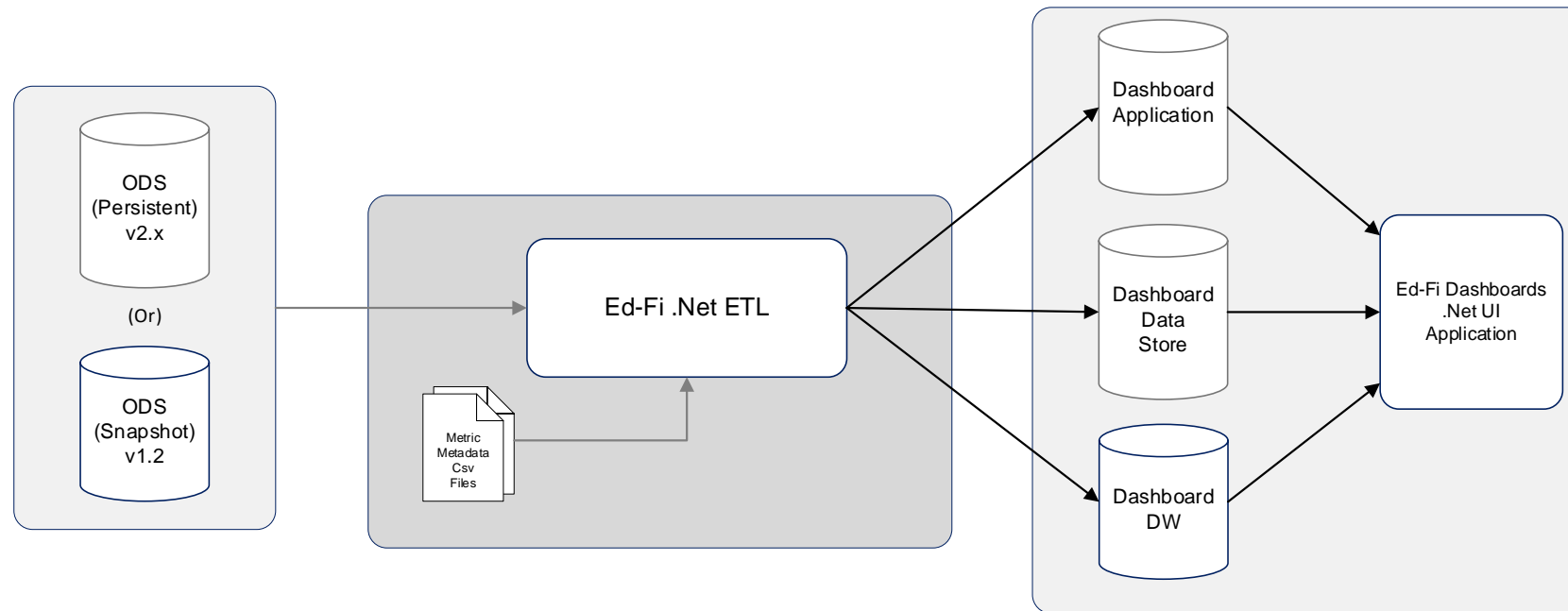


Ed-Fi Dashboards

- Use the Ed-Fi data standard to automatically pull and integrate data from state and district systems
- Customize the Ed-Fi dashboards for state- and district-specific priorities, policies, assessments, and processes



Ed-Fi Dashboards



Ed-Fi Dashboards – v2.0 Solution Stack

Dashboard Details

- .NET ETL application
 - Replaced the SSIS packages of Ed-Fi Dashboards v1.2
 - Works against v1.2 ODS or v2.x ODS
 - Developed for better performance
- Metric Metadata Utility
 - Created to manage the Metric metadata
 - Generalized Assessment Metric Configuration
- .NET MVC Dashboard UI Application
 - Extensible with a Plug-In Architecture
 - Security claim sets to fit education needs

Dashboard Details

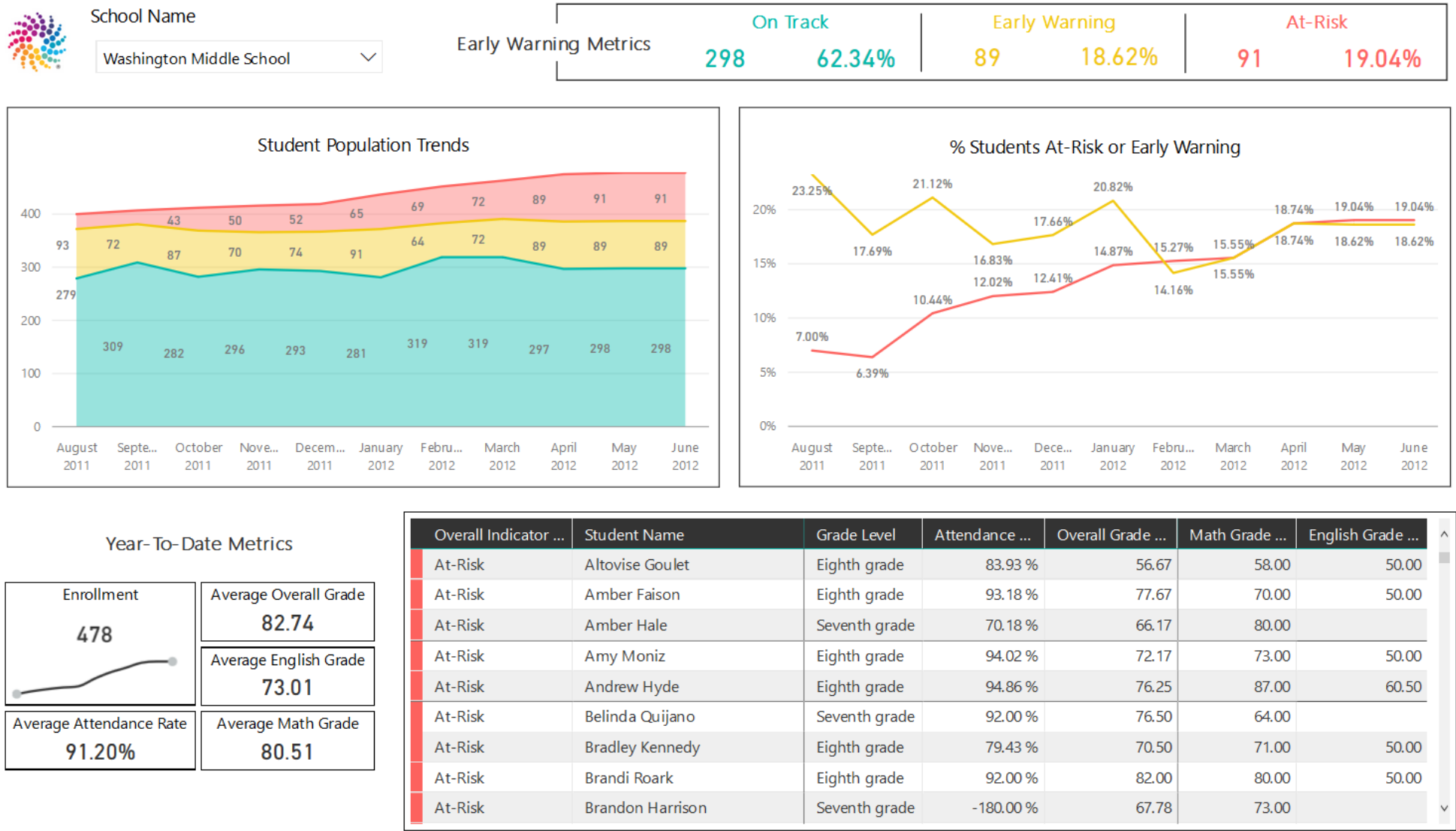
- Community contributions to the dashboards available on the Ed-Fi Exchange
 - Usage Module
 - Early Warning and interventions Catalog
 - Early Learning Insights
 - NWEA MAP Assessments
- Roadmap
 - Dashboards v2.0.3 just released
 - Dashboards v2.1
 - Support for ODS/API 3.0
 - Support for Ed-Fi Data Standard v2.1
 - Release aligned to shortly after ODS/API v3.0
- [Ed-Fi Dashboards](#) on TechDocs

Dashboard Destiny

- The Ed-Fi Dashboards have been around for quite a while. During this time the Ed-Fi Alliance formulated some loose assumption about the Ed-Fi Dashboard mostly based on second hand knowledge
- *Dashboard Destiny* is an initiative to survey the Ed-Fi Dashboards implementer community with an end goal of receiving factual field data about the state of the Ed-Fi Dashboards, a determine the future direction
- Dashboard Destiny Session Friday 9:00AM in TX Ballroom 5

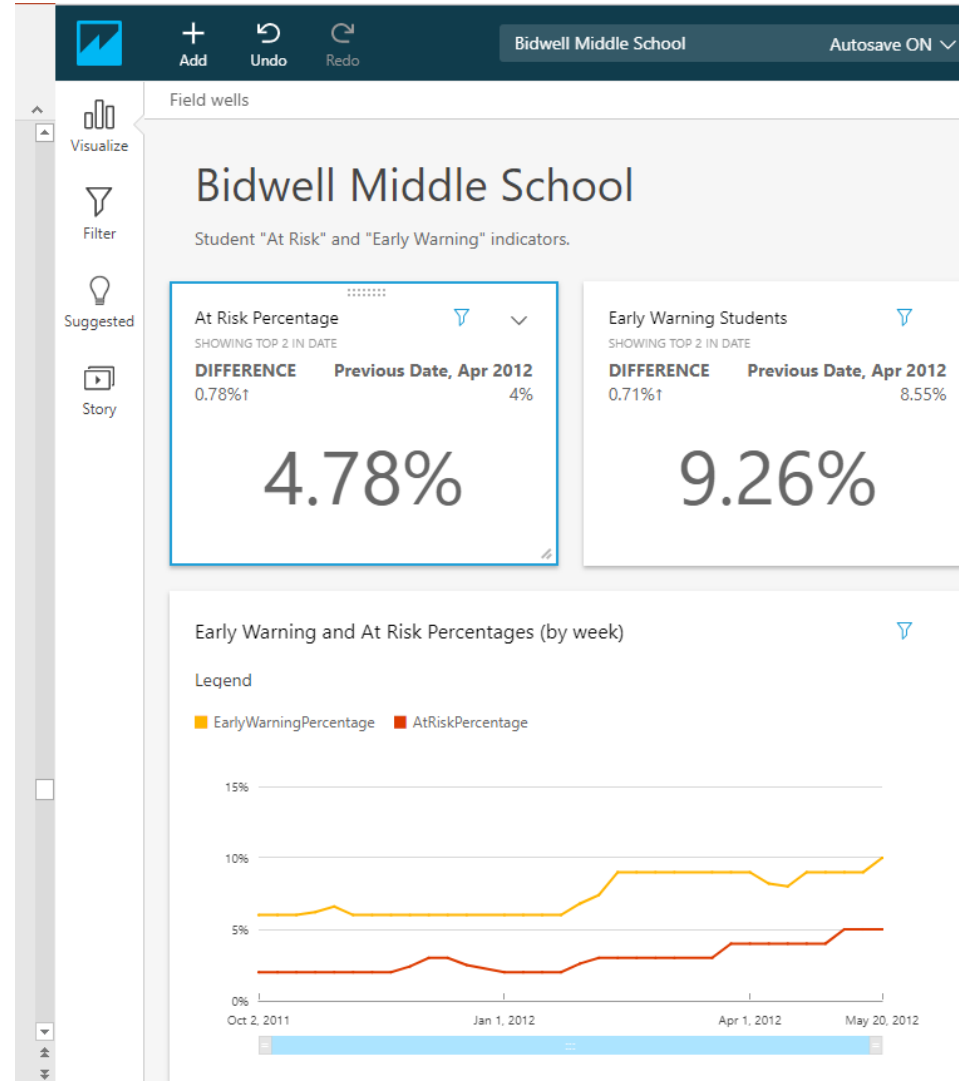
Ed-Fi Enables Data Analytics

Early Warning Indicators using Microsoft Power BI



Ed-Fi Enables Data Analytics

Early Warning Indicators using AWS Quick Sights

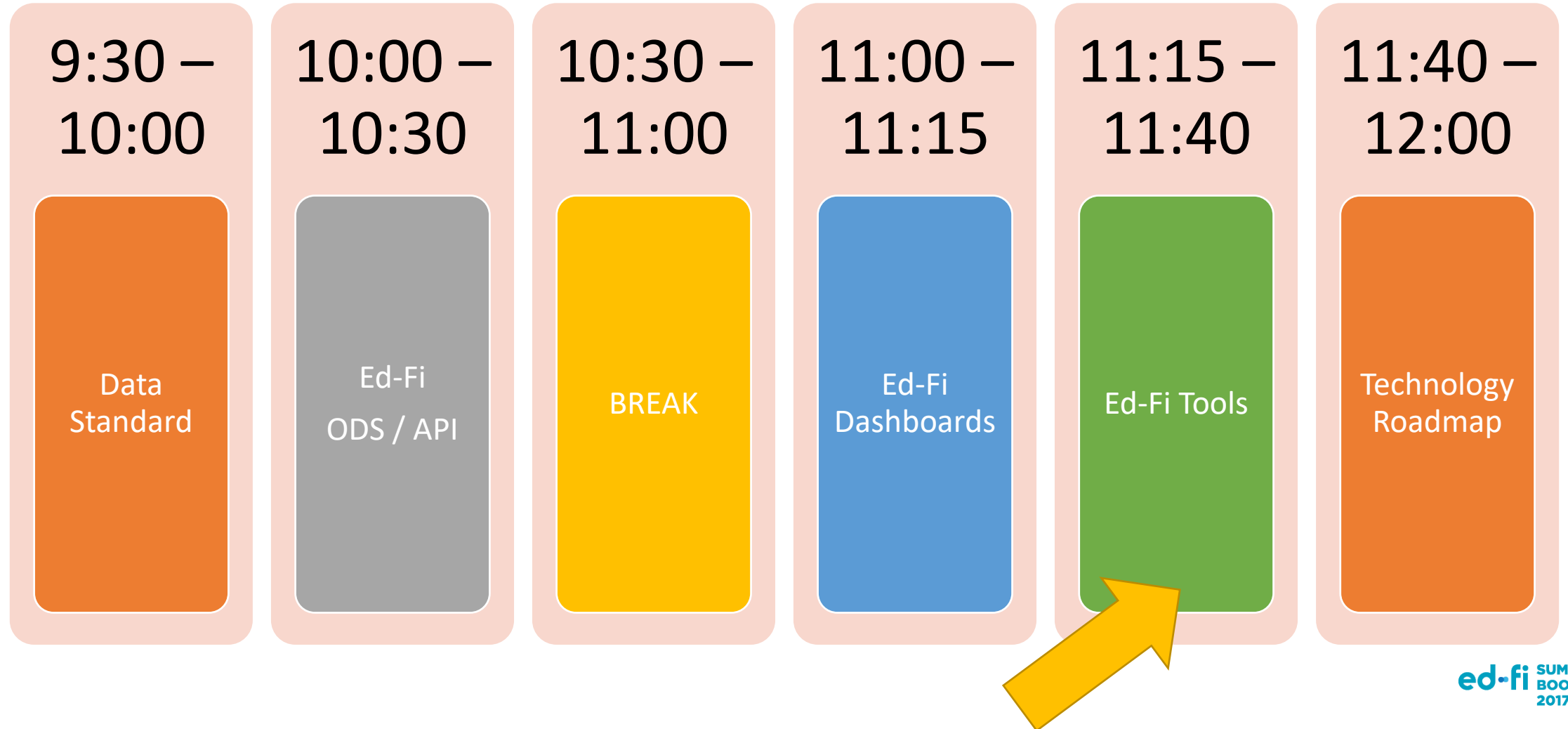


Dashboards – Wrap Up

Day / Time	Theme	Session Title	Presenter(s)	Synopsis
Day 1 8:30 – 9:00	Arrival & Breakfast			
9:00 – 12:00	101-level overview of Ed-Fi Technology	Ed-Fi Technology – 101 (101)	Chris Moffatt Eric Jansson Cy Jones Shannon Kerlick	The focus will be on providing an overview of the full suite of Ed-Fi technology (current on forthcoming), with reference to where in-depth topics will be addressed in the follow-on sessions in the boot camp.
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1:00 – 5:00	200-level tracks, with focus on user-centric implementation scenarios	SEA Implementations (201)	Sayee Srinivasan Ben Meyers (DLP) Michael Taylor (Indiana U)	SEA (and regional) use cases, centered around Ed-Fi “Enterprise ODS”, with in-depth focus on deployment, security.
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Ed-Fi Technology 101 - Agenda





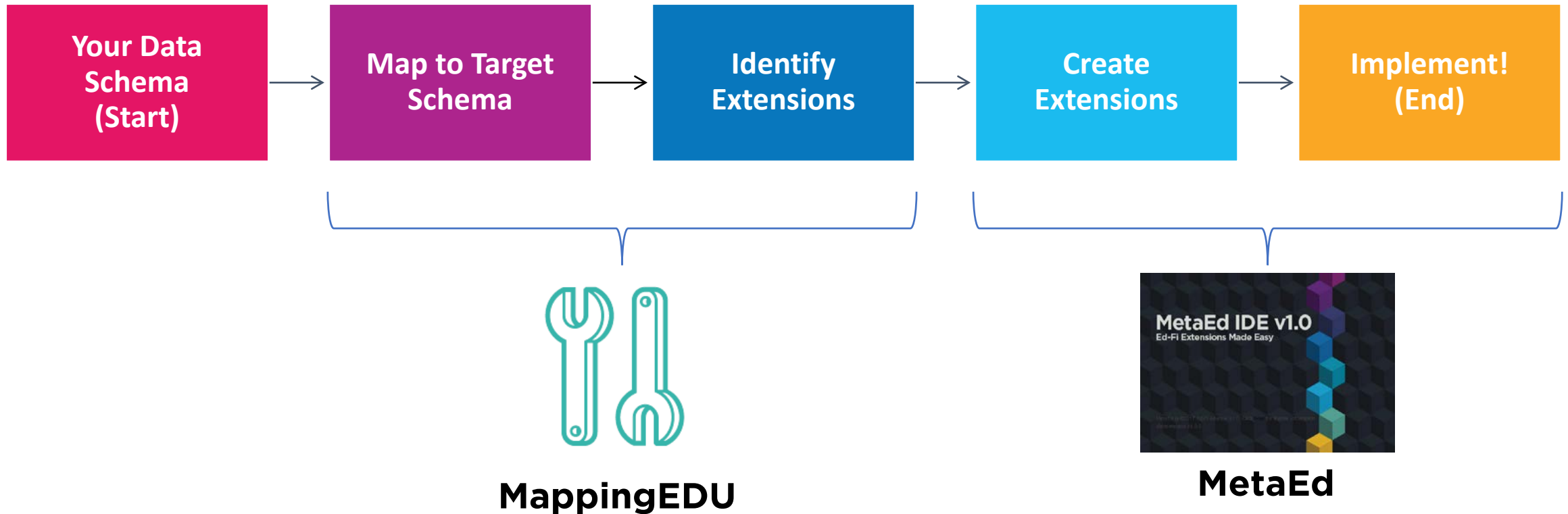
Ed-Fi Technology -101

Ed-Fi Tools

Eric, Chris, Shannon

Data Standard Tools

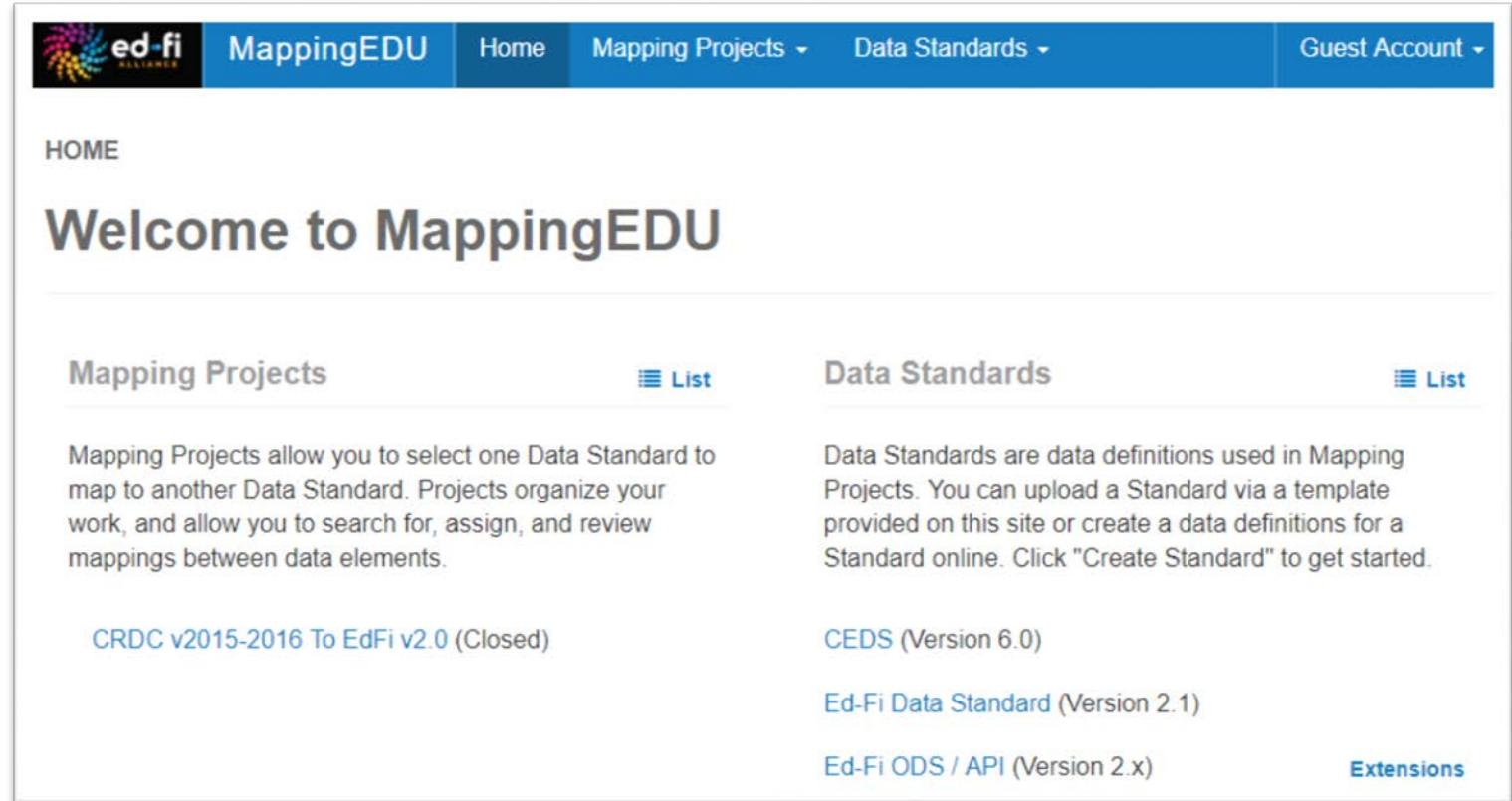
Most Ed-Fi ODS API implementation projects look like this:



Ed-Fi Tools are designed to assist with stages in this process – the two main tools provided are MappingEDU and MetaEd.

MappingEDU

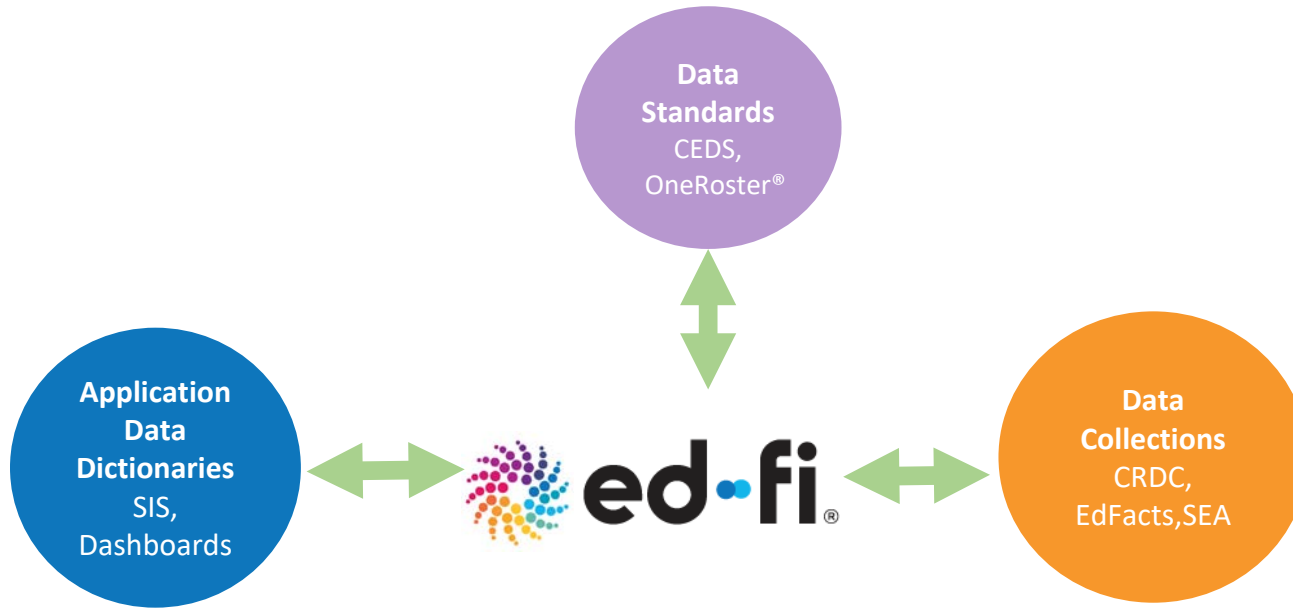
- A Web-based tool for mapping any data standard to another data standard



The screenshot shows the MappingEDU website. At the top is a blue navigation bar with the ed-fi logo, the title 'MappingEDU', and links for 'Home', 'Mapping Projects', 'Data Standards', and 'Guest Account'. Below the navigation bar, the page says 'HOME' and 'Welcome to MappingEDU'. The main content area is divided into two columns. The left column is titled 'Mapping Projects' and includes a 'List' link. It contains a description of mapping projects and a link to 'CRDC v2015-2016 To EdFi v2.0 (Closed)'. The right column is titled 'Data Standards' and also includes a 'List' link. It contains a description of data standards and a list of standards: 'CEDS (Version 6.0)', 'Ed-Fi Data Standard (Version 2.1)', and 'Ed-Fi ODS / API (Version 2.x)'. There is also an 'Extensions' link at the bottom right of the right column.

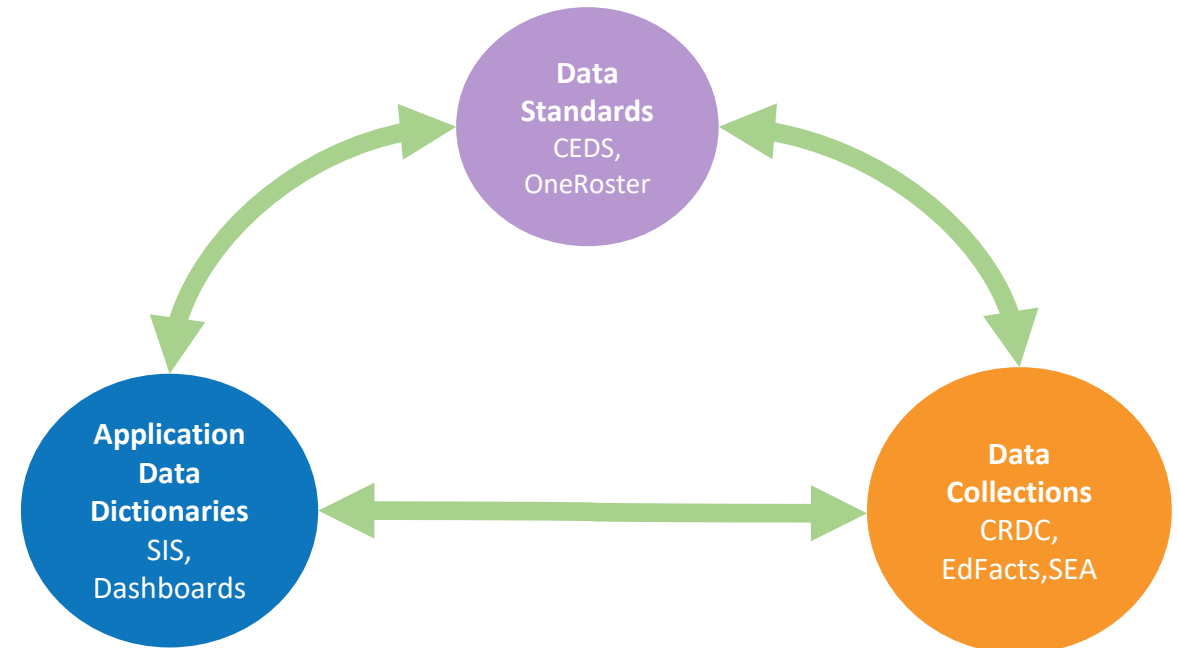
<https://mappedu.ed-fi.org>

Use Cases



Targeted at making the connection of data to and from the Ed-Fi data standard products easier

Also supports mappings between ANY two data definitions



Advanced Features

- Workflow (review, approval)
- Automapping
- Publication



MetaEd and MetaEd IDE



<https://techdocs.ed-fi.org/display/METAED/MetaEd+and+the+MetaEd+IDE>

- Captures extensions to the Ed-Fi data model in a simple domain specific language
- Removes the need to write complex SQL and data definitions in XML for extending the Ed-Fi ODS and API
 - MetaEd handles the hard stuff
- Comes with an IDE based on the Atom text editor

MetaEd Language

[Student.metaed] x	
1	Domain Entity Student [585]
2	documentation "This entity represents an individual for whom instruction, service
3	shared string UniqueId [1705]
4	documentation "A unique alphanumeric code assigned to a student."
5	is part of identity
6	with context Student
7	is queryable field
8	common StudentIdentificationCode [1703]
9	documentation "A coding scheme that is used for identification and record-kee
10	is optional collection
11	is queryable field
12	inline common Name [1694]
13	documentation "Full legal name of the person."
14	is required
15	is queryable field
16	common OtherName [1696]
17	documentation "Other names (e.g., alias, nickname, previous legal name) assoc
18	is optional collection
19	is queryable field
20	enumeration Sex [1701]
21	documentation "A person's gender."
22	is required

The screenshot shows a web browser window with the URL <https://validate.ed-fi.org/Dashboard#>. The page displays a modal window titled "Create a New Test" with a close button (X) in the top right corner. Below the title is the subtitle "Step 1 of 3 - Test Details".

The form contains the following fields and sections:

- Give your test a name (it doesn't have to be unique):** A text input field containing "Schedule XML Test".
- Select a version of the Ed-Fi standard to validate against:** A dropdown menu showing "Ed-Fi Version 2.0".
- Select a validation use case:** A dropdown menu showing "Master Schedule Interchange v2.0".
- Validation Use Case Description:** A text block stating: "This use case checks for conformance to the Ed-Fi Master Schedule Interchange using the Ed-Fi v2.0 schema. For more information see the [Ed-Fi Master Schedule Interchange Brief](#)."
- Interchange Schemas and Validation Rules:** A table with two columns: "Interchange Schemas" and "Validation Rules".

At the bottom right of the modal is an orange "Continue" button.

Interchange Schemas	Validation Rules
Master Schedule Interchange	Interchange Usage Check: InterchangeMasterSchedule

Ed-Fi Validation Tool

Inspects and validates Ed-Fi bulk XML files against the Ed-Fi XSDs and Interchange schemas.

<https://validate.ed-fi.org>

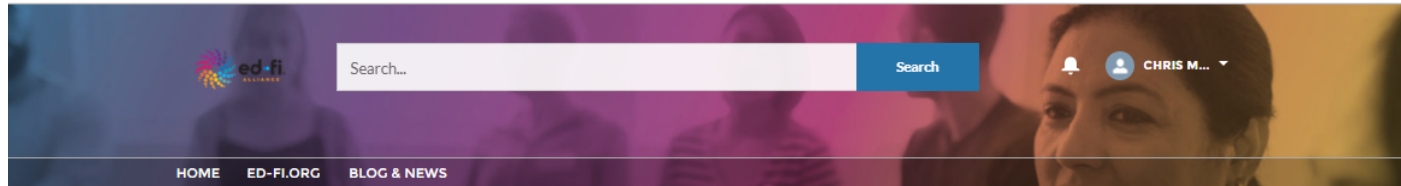
Tests

Create New Test [Show Archive](#)

Validation Status	Created Date	Test Name	Validation Use Case	Ed-Fi Version	Action
✓ (Passed)	9/20/2017	Schedule XML Test	Master Schedule Interchange v2.0	Ed-Fi Version 2.0	View Archive

Community Tools

Ed-Fi Community365



STRONGER TOGETHER

You asked and we listened. Community365 is a new initiative that puts the Ed-Fi community at the center of everything we do, every day.



ISSUE TRACKER

The "central nervous system" for all things related to Ed-Fi. Go here to submit a ticket, propose a change or suggest a bug fix.



TECH DOCS

A one-stop online repository for all technical documentation related to Ed-Fi Technology.



MAPPEDU

Mapping tool for Ed-Fi Community, featuring an Extension Report, which allows community members to view and learn about extensions to the data standard by education agencies.



GITHUB

We host all of our code for Ed-Fi Technology components on GitHub.



ED-FI EXCHANGE

Technology hub for community contributions aligned to the Ed-Fi Data Standard. Go here to find community-developed solutions to common problems.



VALIDATION SERVICE

Enables Ed-Fi adopters to run validation checks against Ed-Fi data exchanges that have been created according to the Ed-Fi Data Standard.

Contact Tech Support



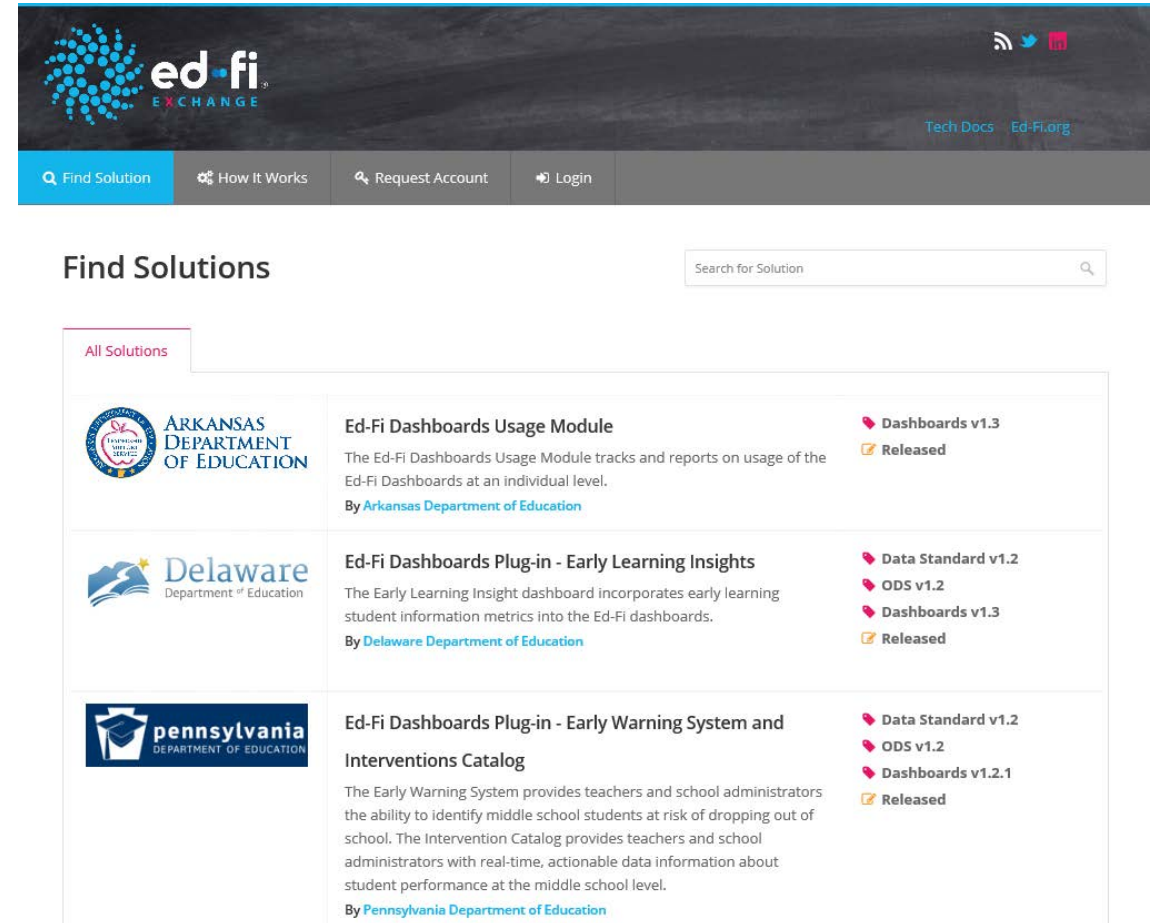
JOIN OUR COMMUNITY SLACK CHANNEL

We've created a Slack channel that is open to the public, which can be treated like a town hall. Join for communication, support, knowledge sharing, and much more.




MORE INFO

Ed-Fi Exchange

- Searchable repository of Ed-Fi Data Standard aligned solutions developed & contributed by members of the Ed-Fi community
- Model RFP and best practices guidance for Ed-Fi data systems
- Provides visibility & access to innovative implementations aligned to core Ed-Fi technology



The screenshot shows the Ed-Fi Exchange website. The header includes the Ed-Fi Exchange logo, social media icons, and links for Tech Docs and Ed-Fi.org. The main navigation bar has links for Find Solution, How It Works, Request Account, and Login. The 'Find Solutions' section features a search bar and a list of solutions under the 'All Solutions' tab. Three solutions are highlighted:

Logo	Solution Title	Version	Status
	Ed-Fi Dashboards Usage Module	Dashboards v1.3	Released
	Ed-Fi Dashboards Plug-in - Early Learning Insights	Data Standard v1.2 ODS v1.2 Dashboards v1.3	Released
	Ed-Fi Dashboards Plug-in - Early Warning System and Interventions Catalog	Data Standard v1.2 ODS v1.2 Dashboards v1.2.1	Released

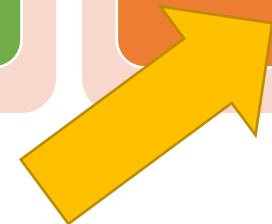
Ed-Fi Tools – Wrap Up

Day / Time	Theme	Session Title	Presenter(s)	Synopsis
Day 1 8:30 – 9:00	Arrival & Breakfast			
9:00 – 12:00	101-level overview of Ed-Fi Technology	Ed-Fi Technology – 101 (101)	Chris Moffatt Eric Jansson Cy Jones Shannon Kerlick	The focus will be on providing an overview of the full suite of Ed-Fi technology (current on forthcoming), with reference to where in-depth topics will be addressed in the follow-on sessions in the boot camp.
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Ed-Fi Technology 101 - Agenda

9:30 – 10:00	10:00 – 10:30	10:30 – 11:00	11:00 – 11:15	11:15 – 11:40	11:40 – 12:00
Data Standard	Ed-Fi ODS / API	BREAK	Ed-Fi Dashboards	Ed-Fi Tools	Technology Roadmap





Ed-Fi Technology – 101

Ed-Fi Technology Roadmap

Eric Jansson

Ed-Fi Technology Roadmap

Pages / Ed-Fi Tech Docs / Tech Community

Edit Save for later Watching Share

ED-FI TECHNOLOGY ROADMAP

The Ed-Fi Technology Roadmap schedule of releases is published annually and updated quarterly. All dates are estimates and subject to change.

2017 Q3 Roadmap Update

July 17, 2017: We are pleased to release the Q3 2017 update to the Ed-Fi Technology Roadmap.



TEMPORAL ODS
CORE - EARLY
ADAPTED RELEASE



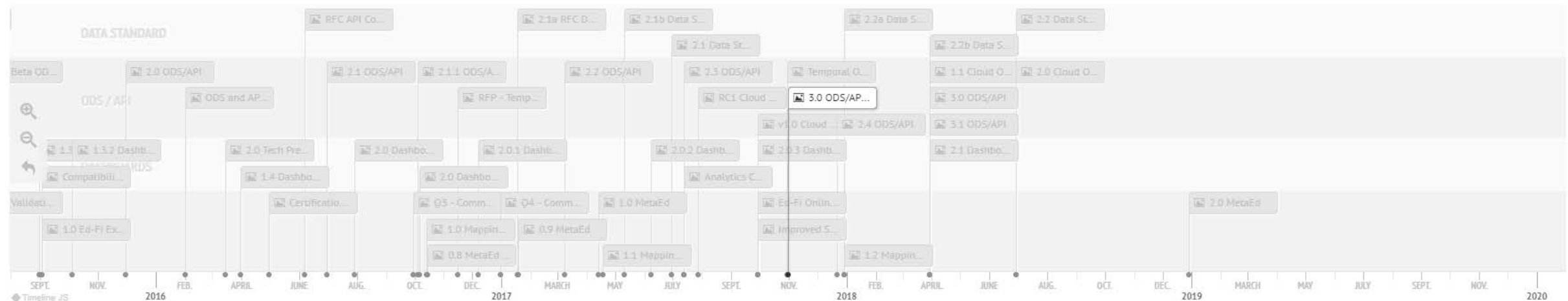
3.0 ODS/API

OCTOBER 31, 2017

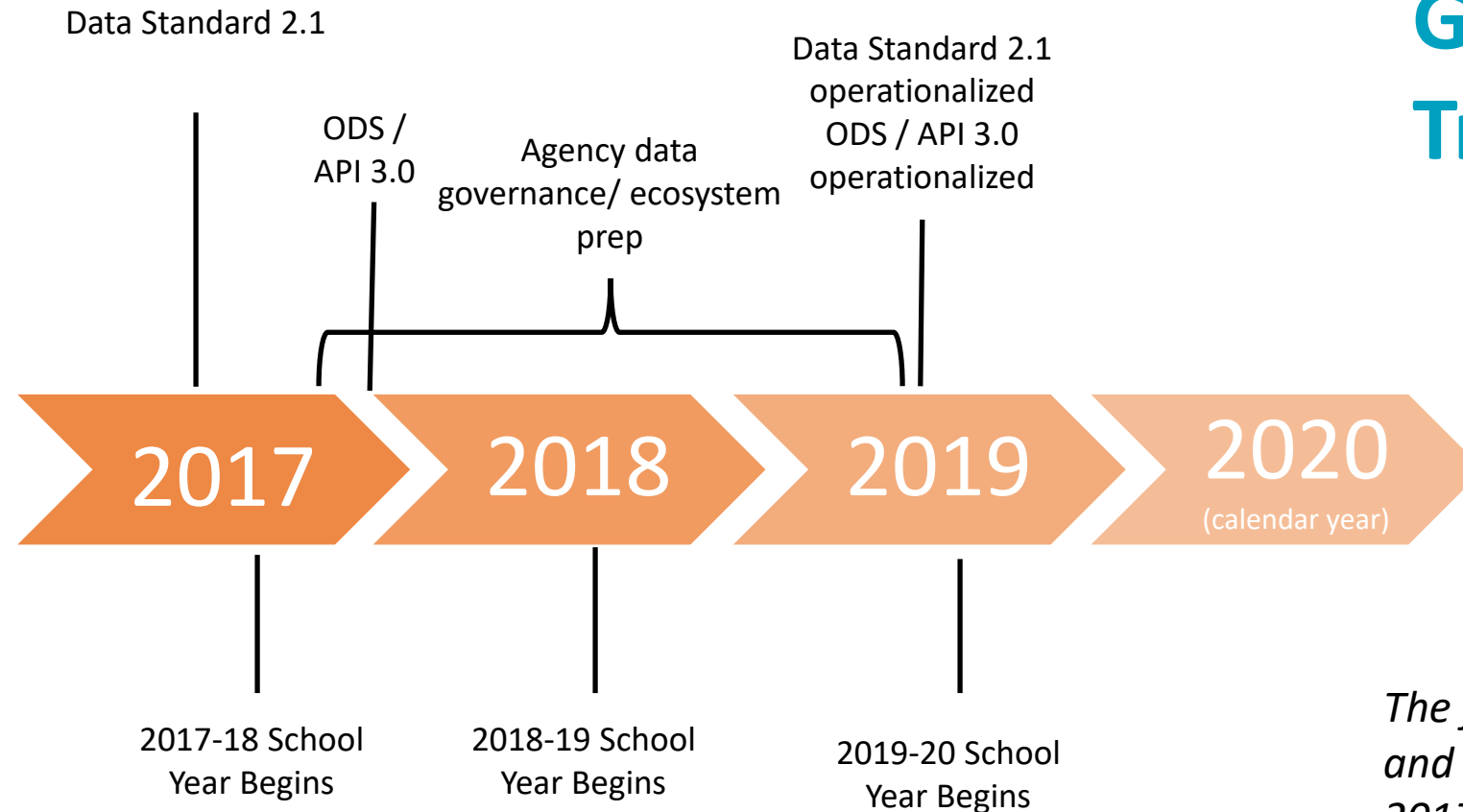
3.0 ODS/API - TECHNICAL PREVIEW

Technical preview release of the ODS / API v3.0. This release is not intended for production use, but is intended to allow agencies, vendors and other community members to test, understand and begin planning for ODS / API v3.0.

For details, please see the 3.0 ODS/API release (will include previews of all major v3.0 improvements).



Ed-Fi 2.0 to 3.0 Generation Transition



The forecast is that agency governance and preparation takes place over the 2017-19 process, with the ecosystem migrating for the 2019-20 school year.

This revision was made following 2017 Ed-Fi Technical Congress.



Hold The Date!

Ed-Fi Technical Congress – 2018

April 9th – 13th

Austin, TX

101 - Ed-Fi Technology That's a Wrap!

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