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Education Preparation Dashboard

RESOURCE GUIDE

June 01, 2021

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Introduction

The Educator Preparation Dashboard is the result of collaboration with many Educator Preparation Programs (EPPs), states, and districts. The metrics and visualizations represented in the dashboard represent the common, top priority use cases to inform Educator Preparation effectiveness and program improvement. The visualizations were designed to present those metrics in the simplest and most informative ways. The dashboard is designed so that it can be implemented by any educator preparation organization with the Ed-Fi Educator Preparation Data Model (EPDM). The Educator Preparation Dashboard was developed to integrate with the Ed-Fi data standard and the EPDM extension. This first version of the Educator Preparation Dashboard is designed primarily from the perspective of implementation by an EPP or network of EPPs. However, it is also designed to be flexible so that modules could be implemented by a state or district with a focus on educator preparation and the educator talent pipeline.

The Educator Preparation Dashboard includes data that spans the full spectrum of an Educator Preparation program - from entry into the prep program, the knowledge and experience teacher candidates gain from coursework and field work, through post-completion including employment in K-12 schools and K-12 impact.

Dashboard Versioning

Educator Preparation Dashboard resources will be aligned and tagged to EPDM versions. The following table includes dashboard version history and compatibility.

Ed-Fi Data Standard	Ed-Fi ODS/API	EPDM	Dashboard Version	Sample Database	Date of Dashboard Release
3.0	3.0	0.6	0.6	EdFi_Ods_EPDM_2007_306.7z	6/01/2021

Accessing the Educator Preparation Dashboard Resources

The following describes the documentation and resources available for the Educator Preparation Dashboard.

- The tabular model code is available: https://github.com/crocusllc/Teacher-Preparation-Dashboard
- All other resources referenced in this document are in this folder.

Dashboard Content Overview

The Educator Preparation Dashboard resources are intended to be flexible to implement based on the data that you have available in your Ed-Fi EPDM ODS. The dashboard is organized into six modules. These modules can be used individually, implemented in cycles or all together. The visuals and pages in each module can also be removed, revised or expanded.

Modules:

- Enrollment
- Candidate Performance
- Program Information
- Post Completion
- University School Partnerships
- Teacher Candidate

Visualizations in each module were identified by stakeholders as priority inputs to identify trends, strengthen data informed decision making, and inform continuous improvement.

The following is a description of each of the modules in the Educator Preparation Dashboard. An interactive demonstration version of the dashboard is available, deployed on Power BI service, using the Educator Preparation Program Data Model (EPDM) containing a data sample data set. This demo can be accessed with the following link and login credentials. This username has a PowerBI license assigned to it, which provides access to view and interact with the dashboard demo.

Interactive Demo Dashboard

https://tinyurl.com/EPDashboardDemo
Username: demo.tpp-dashboard.admin@crocusllc.com
Password: Wonder.Demo.World.Music1

Overall Structure

Each module contains a set of pages that are further organized to address use case questions.

- Filters - Each page contains a set of filters that can be used to disaggregate the data, e.g. by program, year, cohort, or campus. Filters vary by page depending on the type of data.
- Summary page - The summary page is the name used to navigate back to the landing page of a tab.
- Compare - Some pages include the functionality to compare data across two categories, e.g. enrollment across two programs or assessment scores across two different assessments.
- Demographics - Each summary page contains a demographic view of the top priority measure, broken down by race/ethnicity and gender.

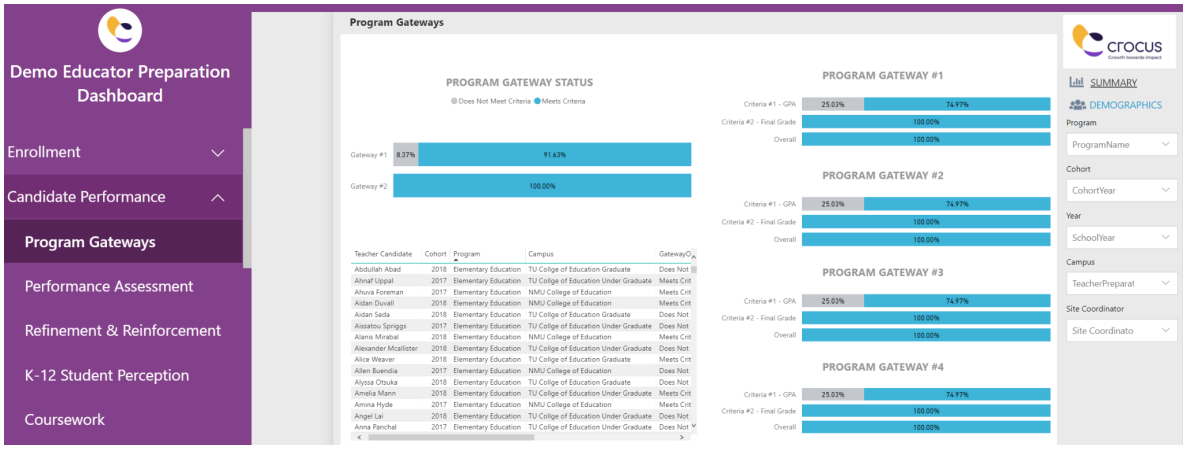
Enrollment

The Enrollment module addresses the pipeline and progression into the program and profile of teacher candidates in the program. This includes the number of applied, accepted, and enrolled teacher candidates and the median pre-program ACT score, SAT scores, and pre-program GPA for each of these groups.

Candidate Performance

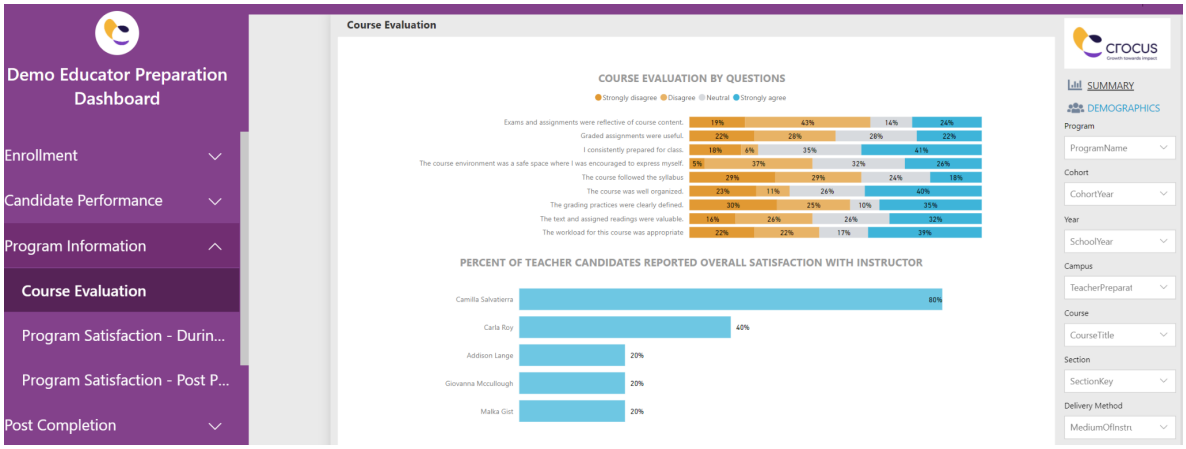
Candidate performance tracks teacher candidates progress through the program including their coursework, clinical experience: performance assessments, disposition assessments, mentor evaluations, and K-12 student perception surveys, and key program assessments. The landing page of Candidate Performance contains a concept

of program gateways or transition points, which can be customized to meet the needs of a program's defined gateways.



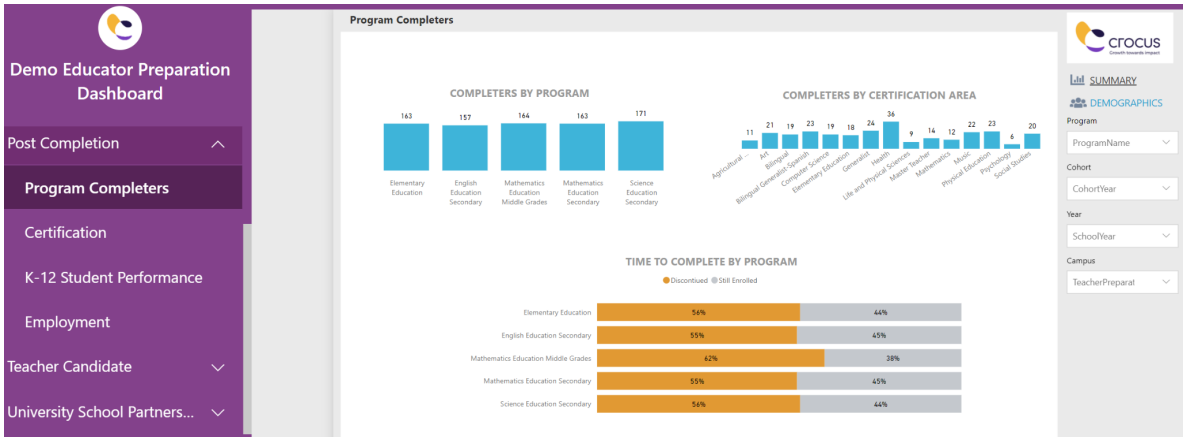
Program Information

Program Information includes information about the program gathered through surveys, including course evaluations, during program and post program surveys from program completers and employers.



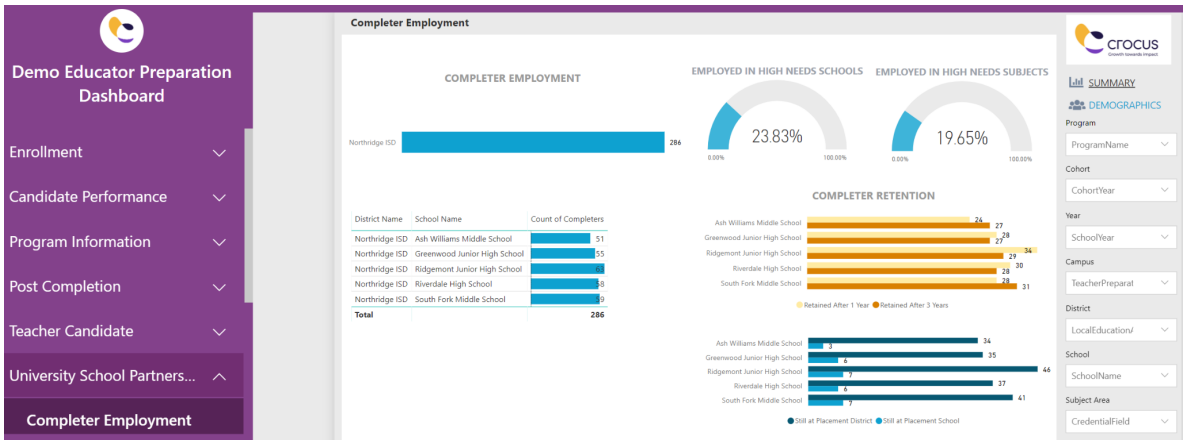
Post Completion

Post Completion includes data for program completers and those that are now employed as educators. Visualizations include a summary of completers by program, certification area, and time taken to complete the program. This module also includes certification details for completers, employment information, and K-12 student performance of employed completers.



University School Partnerships

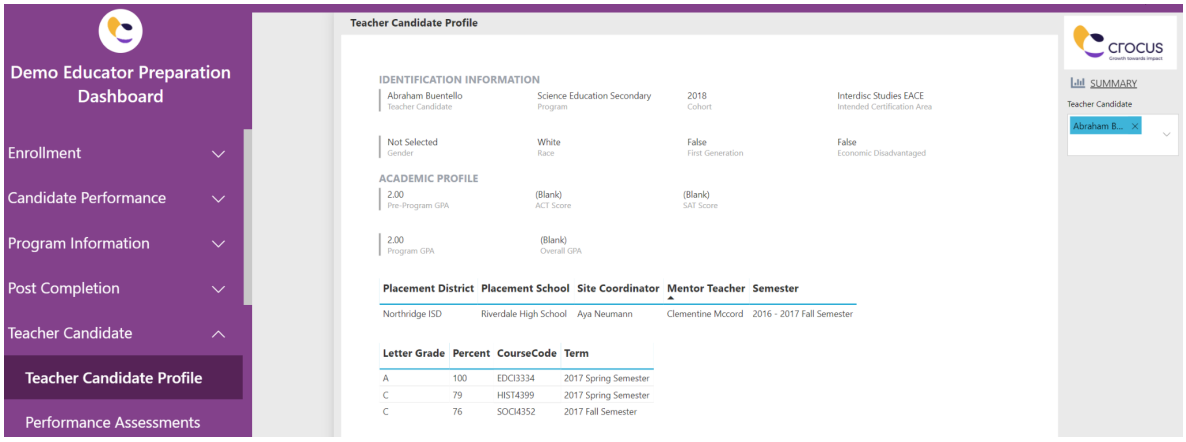
University School Partnership includes similar visualizations as Post-Completion, with the purpose of examining information for EPP district and school partners. This includes completer employment, district profiles, K-12 student information, mentor teacher information, partnership surveys such as principal surveys, and K-12 student performance.



Teacher Candidate

The Teacher Candidate module includes data on an individual teacher candidate. This section of the dashboard can be used by faculty and staff when advising teacher candidates or can be made available to teacher candidates to review their own progress. Data includes identification information, academic profile, placement information, performance assessment scores, K-12 perception surveys during the fieldwork. This module also contains the same district and school profiles and employment information pages that are in University-School Partnerships. This enables EPPs to

provide this data to teacher candidates to support their decisions for field work placements.

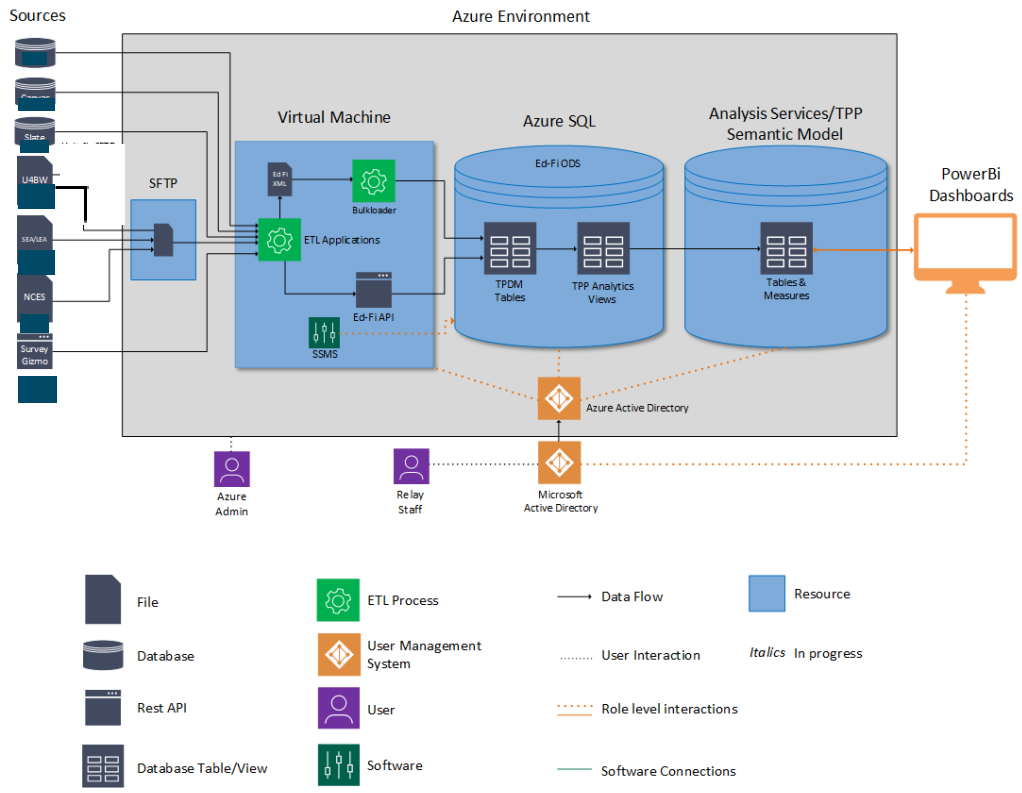


Overall Architecture and Components

The Educator Preparation Dashboard is developed to work with the Ed Fi Educator Preparation Data Model (EPDM). Educator Preparation Data Model (EPDM). Main components of a complete Ed-Fi EPDM ODS and dashboard solution include:

- **Source systems** – this is data that will be integrated into your Ed-Fi EPDM ODS based on defined use cases for the ODS and dashboard, e.g. Student Information System (SIS), Learning Management System (LMS), Surveys, Employment Data, etc.
- **Ed-Fi ODS with EPDM extensions**
    - Visit this page to learn more about the EPDM.
    - Also, please refer to the following for technical resources on the EPDM:
        - Getting Started - Educator Preparation Data Model: https://techdocs.ed-fi.org/display/EPDMX/Getting+Started
- **Tabular Model** - Tabular model is the analytic data model that allows quick aggregation and filtering of fact tables using dimension tables (In this case the flattening of the normalized ODS into flat tables is achieved by the analytic views).
- **Power BI Reports** – the reports have been designed using the measures and aggregations from the tabular model to display through various visuals for an interactive view of the data. These can be downloaded to a desktop version of PowerBI and published.

The following depicts a sample architecture of the components described above. This sample is for an Azure hosted environment, but the solution can be hosted in any cloud environment or on-premise.



Resources

The following describes the documentation and resources available for the Educator Preparation Dashboard.

- The tabular model code is available: https://github.com/crocusllc/Teacher-Preparation-Dashboard

The stand-alone SQL server data tools ssdt or the visual studio extension is required to open the semantic model.

- **Sample Database:** The sample database has generated data that mimics the "real world" use cases. Named: EdFi_Ods_EPDM_2007_306.7z
- **PBI report:** The Power BI report contains all the data visualizations implemented in Power BI over the domains of the semantic model.
- **Tabular model code:** Tabular model is the analytic data model that allows quick aggregation and filtering of fact tables using dimension tables (In this case the

flattening of the normalized ODS into flat tables is achieved by the analytic views).

- **Tabular model documentation** (excel files)
  - Pages-Tables-Fields-Combined.xls
  - ViewMetaData.xls - shows the dependency of the view to the database tables and fields that power it. It also has the view definition so that it can be used during troubleshooting.
- **Educator Preparation Dashboard Visualization Definitions:** Documentation of all visualizations and business definitions of the metrics.

Prerequisites

- For Azure:
  - Microsoft Azure Subscription
  - Azure Global Administrator Rights
  - Azure SQL Database
  - Azure Analysis Services
    - Optional: Azure Automation
  - Ed-Fi license
- Non-Azure (On Prem, AWS, etc.)
  - SQL Server (2017 or better)
    - Temporal Tables Necessary for EPDM Data Model
    - SQL Server Analysis Services (SSAS)
- For all platforms
  - Microsoft 365 Subscription
  - Access as an Office 365 Administrator
  - An Ed-Fi ODS version Ed-Fi ODS / API v3.1.1
    - EPDM Extension v0.6 from the Ed-Fi Exchange
  - Visual Studio (2017) with Data Tools (https://docs.microsoft.com/en-us/sql/ssdt/download-sql-server-data-tools-ssdt?view=sql-server-2017)
    - Necessary for the middle tier solution

        - Necessary for the semantic layer in Analysis Services
            - Data Processing and Storage
        - You can also just install Data Tools separately but will lose some functionality.
    - Power BI Desktop
- Power BI Pro or PowerBI Premium License
    - In order to access the dashboard, the user must have a Power BI Pro or Premium license. More information can be found at https://www.powerbi.com to determine which account fits your needs.

Deployment of Educator Preparation Dashboards

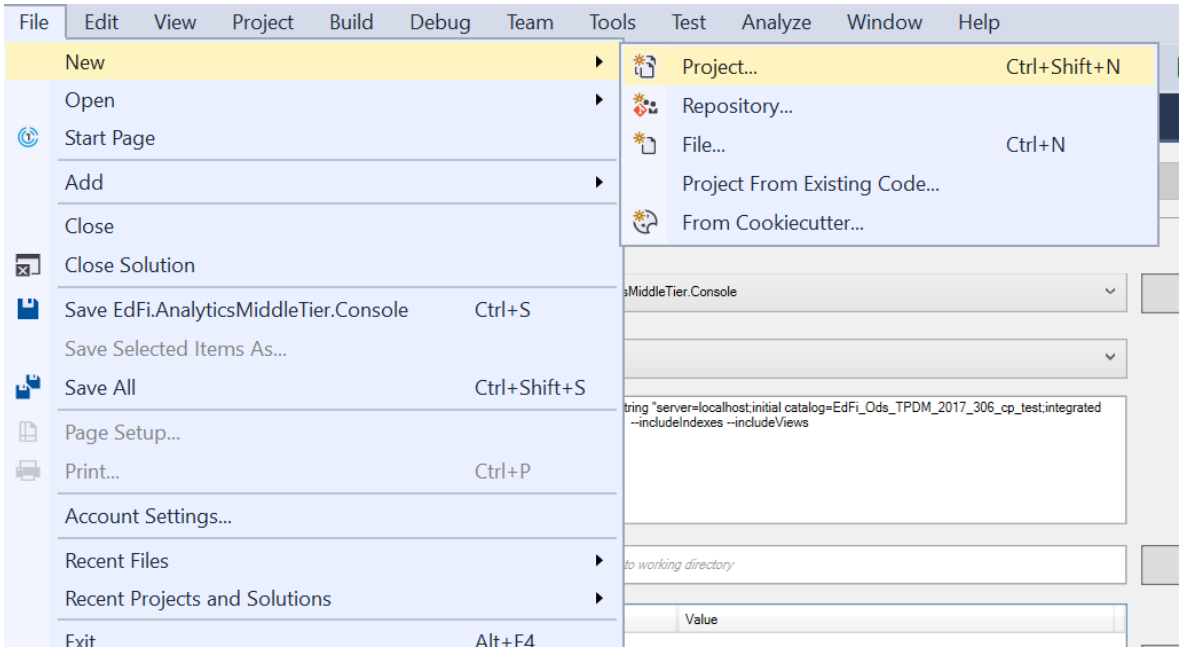
Deployment of the Educator Preparation Dashboard resources requires an installed Ed-Fi ODS with EPDM extensions (version referenced on page 2) with your real data or the sample database, EdFi_Ods_EPDM_2007_306.7z.

The following sections include instructions for:

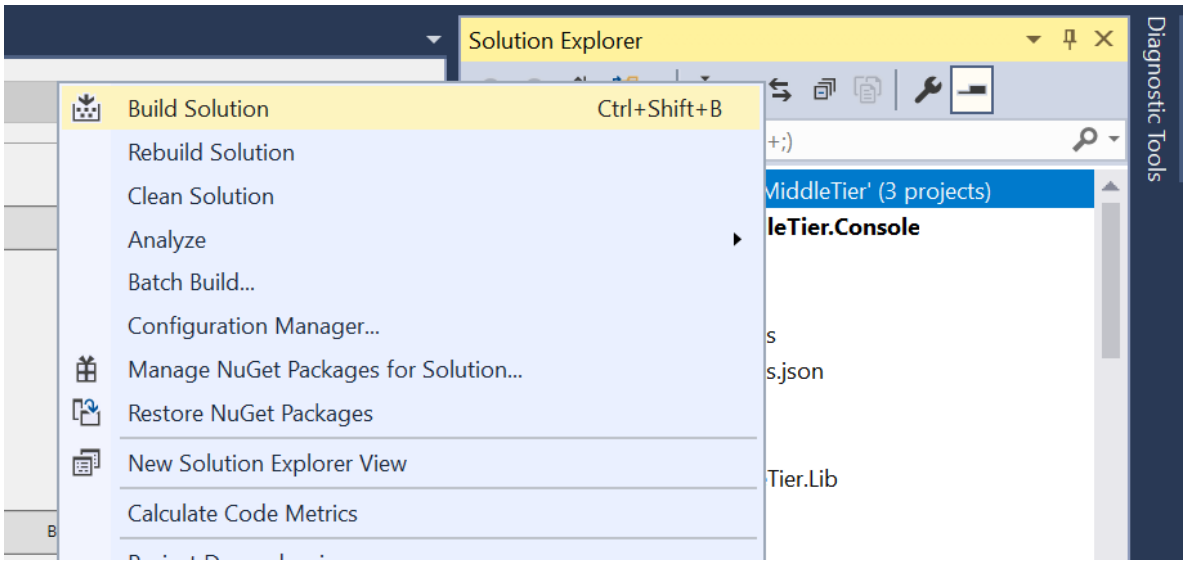
- Installing the Middle Tier (see instructions on following page)
- Installing the Tabular model (see instructions on page 15)
- Power BI Deployment (see instructions on page 17)

Installing the Middle Tier

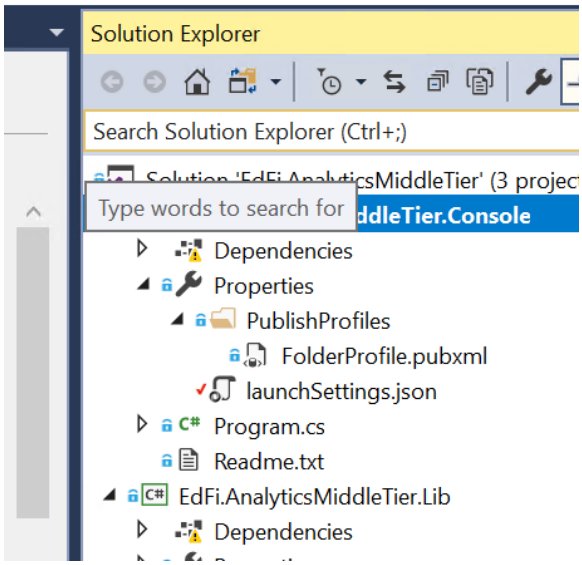
1. You will need admin rights to your machine or at least the ability to run Visual Studio as an admin. Open the file EdFi.AnalyticsMiddleTier.sln following these steps:

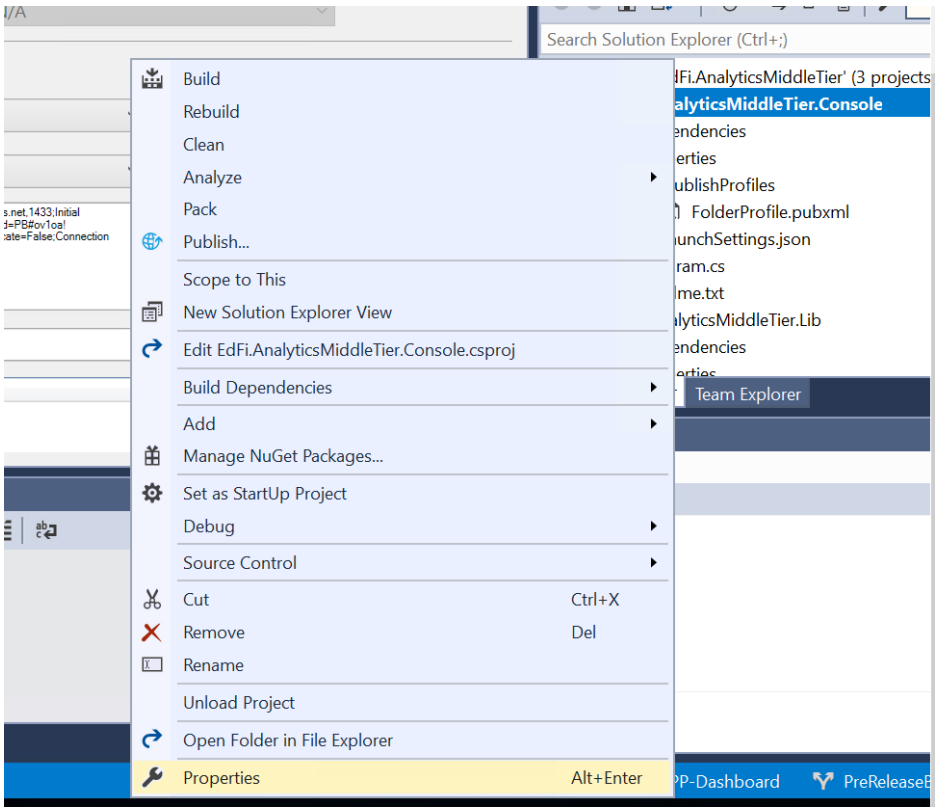


2. Once the solution is open, build the solution using the following step:

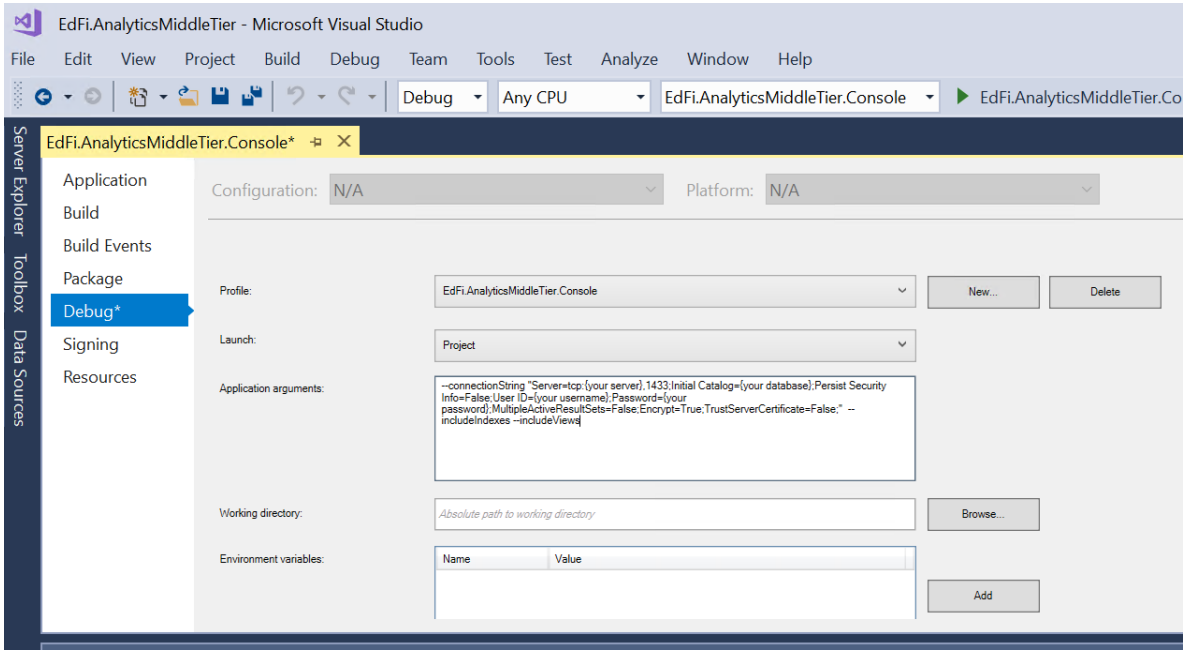


3. Right click on the EdFi.AnalyticsMiddleTier.Console and then click on properties.

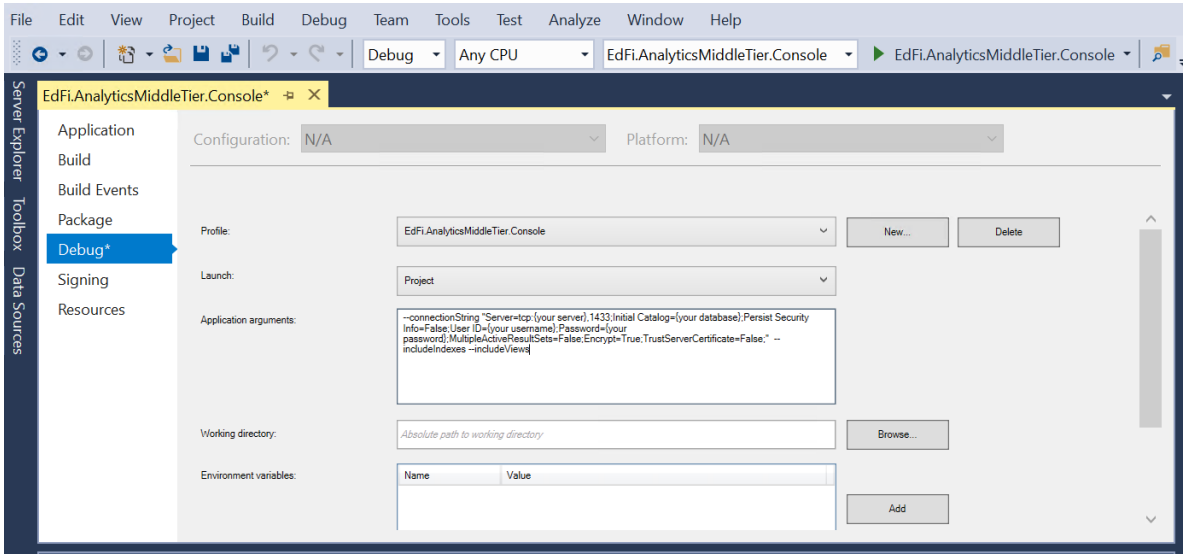

Solution Explorer
Search Solution Explorer (Ctrl+;)
Type words to search for
Dependencies
Properties
PublishProfiles
FolderProfile.pubxml
launchSettings.json
Program.cs
Readme.txt
EdFi.AnalyticsMiddleTier.Lib
Dependencies


Search Solution Explorer (Ctrl+;)
Build
Rebuild
Clean
Analyze
Pack
Publish...
Scope to This
New Solution Explorer View
Edit EdFi.AnalyticsMiddleTier.Console.csproj
Build Dependencies
Add
Manage NuGet Packages...
Set as StartUp Project
Debug
Source Control
Cut Ctrl+X
Remove Del
Rename
Unload Project
Open Folder in File Explorer
Properties Alt+Enter
Team Explorer

4. Once in properties, click on DeBug* and change the connection string.

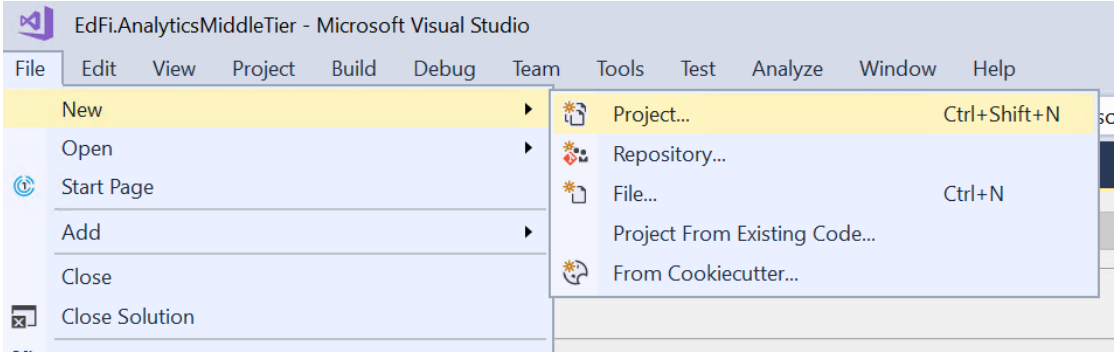


5. Run the solution:

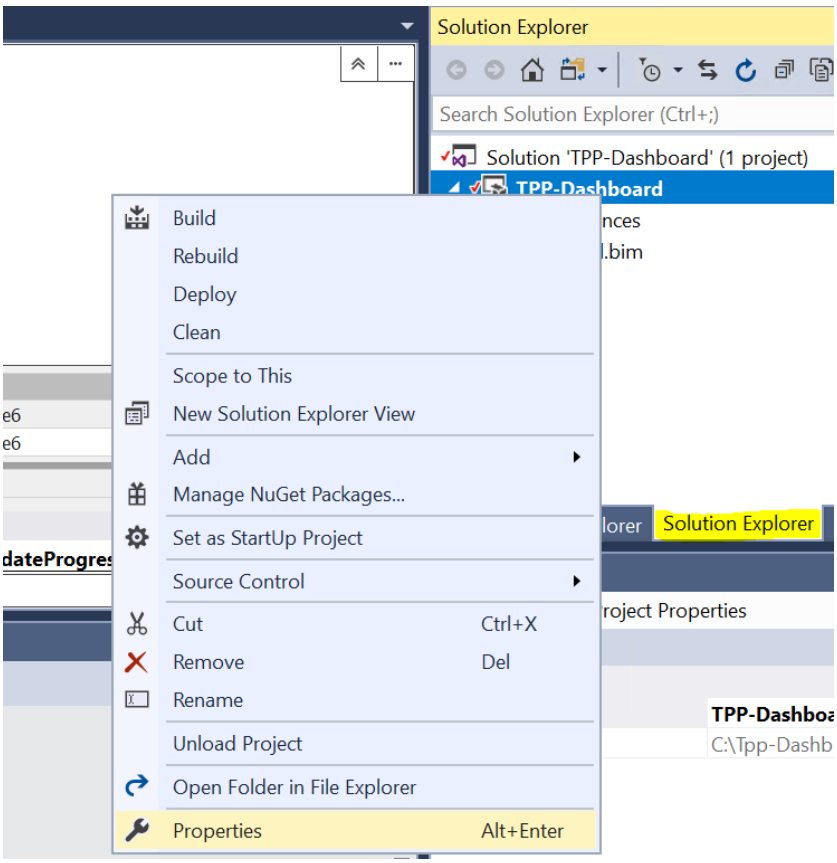


Installing the Tabular Model

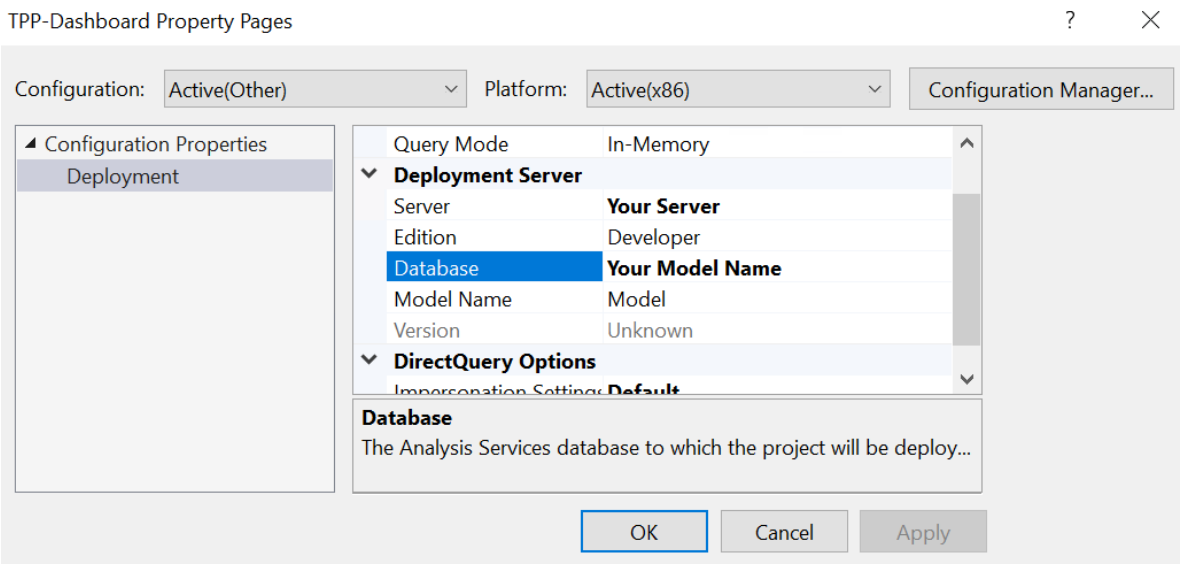
1. You will need admin rights to your machine or at least the ability to run Visual Studio as an admin. Open the file TPP-Dashboard.smproj following these steps:



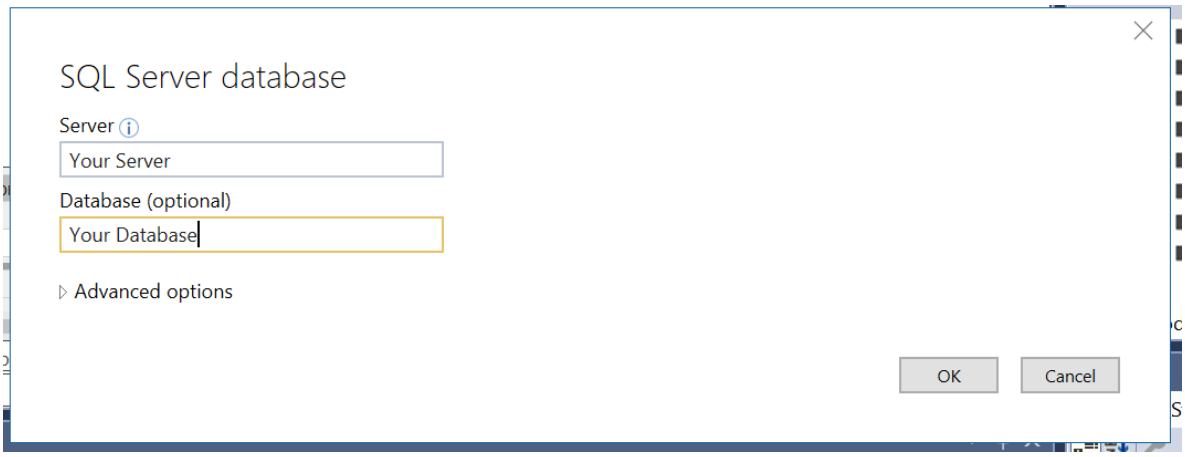
2. Once you open the project look at the right hand navigation, and click on the 'Solution Explorer' tab. Right click on 'TPP Dashboard' and then click on Properties as shown below.



3. Change the Server and Database name to match the Analysis Services location that the model will deploy.



4. Back in the right hand navigation, click on 'Tabular Model Explorer' and expand 'Data Sources' and double click on 'Ed-Fi-Ods'. Change the server and database to where your EPDM model data source lives:



5. Right click on the 'Ed-Fi-Ods' and change the credentials to the appropriate set of credentials based on your server configuration.

Power BI Deployment

1. Open the Power BI folder in the shared Google Drive folder.
2. Open one of the .PBIX files in Power BI Desktop.
3. You will be prompted to log in to your Active Directory login.
4. You will receive an error message stating that your account does not have access to the server. This is correct - it is trying to authenticate your account to an invalid server (the one used for initial development of this model).
5. Select 'Edit' on the warning message and enter your Analysis Services connection string. Leave the Database Name alone - this is hardcoded in the Semantic Model.
    - If you did not write this down after deploying the Azure components, you can view it in the Azure Portal. It will look something like as azure://{region}.asazure.windows.net/{ssas- name}
    - In the future you can return to the connection settings from the Home ribbon, under Edit Queries > Data Source Settings
6. When prompted, select "Model". This is selecting the Semantic Model within the Analysis Services server.
7. Once connected, select "Publish" in the top ribbon menu. You may be prompted to log in to your Power BI account.
8. Select the workspace that you'd like to publish these reports to.
    - You may see an error about not finding a Gateway Connection:
        - If your Analysis Services model is an Azure Analysis Services, ignore the error.
        - If your Analysis Services model is on an on-prem SQL Server, then you will need to configure a Gateway.
9. The reports should now be visible on the Power BI Web Service.
10. Before the reports can be completely used, you must complete the Post-Deployment Actions below.

Note: In order to view the reports on PowerBI.com, you must change the workspace from 'My Workspace' to one of the security groups.

Post Deployment Actions

Once all the Azure and Power BI components are fully deployed, the Tabular Model will need to be processed. This step is required; it will pull information into the Azure Analysis Services server from the ODS and allow the individuals to view the Power BI reports.

1. Process the Tabular Model database manually.
    - Load SSMS and navigate to Connect - Analysis Services.
    - Enter the Azure Analysis Services connection string. You'll be prompted to log in with your Azure AD account.
    - Right-click the database and select "Process". For the first time, you'll want to use Process Full. This can take some time depending on your Analysis Services tier.
        - If you find that you have a credential problem when connecting to the SQL Server, in SSMS, expand Ed-Fi > Connections. Double-click on Enterprise ODS. In the next dialog box, click in the Credentials property to edit the credentials.
2. Verify that your Power BI Workspaces are set to read-only. This ensures that your end users cannot modify the reports for other individuals.
    - Log in to the Power BI Web Service.
    - Open up the Workspace selection menu.
    - Click on the three-dot menu next to each workspace. Select "Edit workspace".
    - Change the drop-down menu under the Privacy subsection to "Members can only view Power BI content".
    - Click Save to apply the new settings.

Navigation with Power BI Apps

Power BI has developed features that enable integrated navigation functionality. You can refer to this Power BI resource to set up App Navigation.

This version contains a left menu navigation. The top level contains the module name (e.g. Enrollment). Subsections are listed for each page contained in that module. The right side menu enables users to navigate to a demographics view, a comparison view (where applicable) and includes filters.

There are a series of PBI files that support this navigation. There is a file for each module, in the **App Navigation folder**.

The following are benefits to option 2 navigation approach:

- Separate PBIX files for each module provide flexibility in the way you publish your dashboard. You can combine them into a single app as shown above, or individual apps for each module.
- The "new look" in Power BI works well with the app navigation approach. With option 1, the new look creates a confusing interface for end users by listing dashboard pages on a new left menu.
- Removing the top menu navigation provides additional space for visualizations.
- Modifying the report (adding or removing pages) is easier with this approach. With option 1, removing or adding a page requires adding or removing shapes from each page that menu item would display.

User Roles

The following user roles are created in the Semantic Model and create a logical connection between the user and the data. However, the link between an organization's active directory accounts and the user roles need to be managed. There are some differences between how they will be managed in an on-premise SSAS setup versus an Azure setup. These default roles allow for the following permissions:

Administrator: Access to all data on the dashboard. Will be able to view aggregate level data as well as the detailed data that makes up the aggregates. No limitation across any data categories.

Supervisor: This is intended for a Site Supervisor / Site Coordinator role at a TPP. This user role provides access to teacher candidate data that are associated through the TeacherCandidateStaffAssociation in the EPDM.

Teachers: This is intended for a faculty role at a TPP. This user role provides access to teacher candidate data that are associated through a course section.

Teacher Candidate: Access to their own detailed data for Teacher Candidate related data categories. No access to other data.

Multi-Year or Single Year Support

The model supports multi-year queries by using the temporal feature of the SQL-Server. The temporal feature that is added to the SQL server as of SQL Server 2017 supports versioning tables, and by using that feature, it is possible to keep historical data (previous year data) in the Ed-Fi ODS after a school year rollover process is completed. The school year rollover process includes deleting the data in the regular (non-version) tables, which will trigger the data transfer to version (historical-tables).

By writing a query that pulls analytic views for each school year rollover dates and combining the returned data to the current school year data, it is possible to do year over year analysis. The key collision issue across the school years is also resolved by combining the natural keys to the school year key to form a unique key per school year.

Once you complete a School Year rollover in the Ed-Fi ODS, for the next year data load you need to maintain the historical associations, so the following is recommended:

Load the following from all previous years (what was the state of the DB from the previous year)

- TPDM.TeacherCandidate
- edfi.Staff
- TPDM.StaffTeacherCandidateAssociation (CompleterAsStaffAssociation in EPDM 0.7)

For additional guidance on the School Year rollover and temporal tables, please reference the School Year Rollover Guidance document.

Additional Information

Questions

Contact: Lori Ludwick-Pascuzzi, Crocus, LLC., lludwick-pascuzzi@crocusllc.com

Educator Preparation Dashboard Stakeholder Group

If you are interested in participating and/or submitting feedback, contact Lori Ludwick-Pascuzzi, Crocus, LLC., lludwick-pascuzzi@crocusllc.com.