Data API builder

Creating codeless REST & GraphQL APIs in minutes

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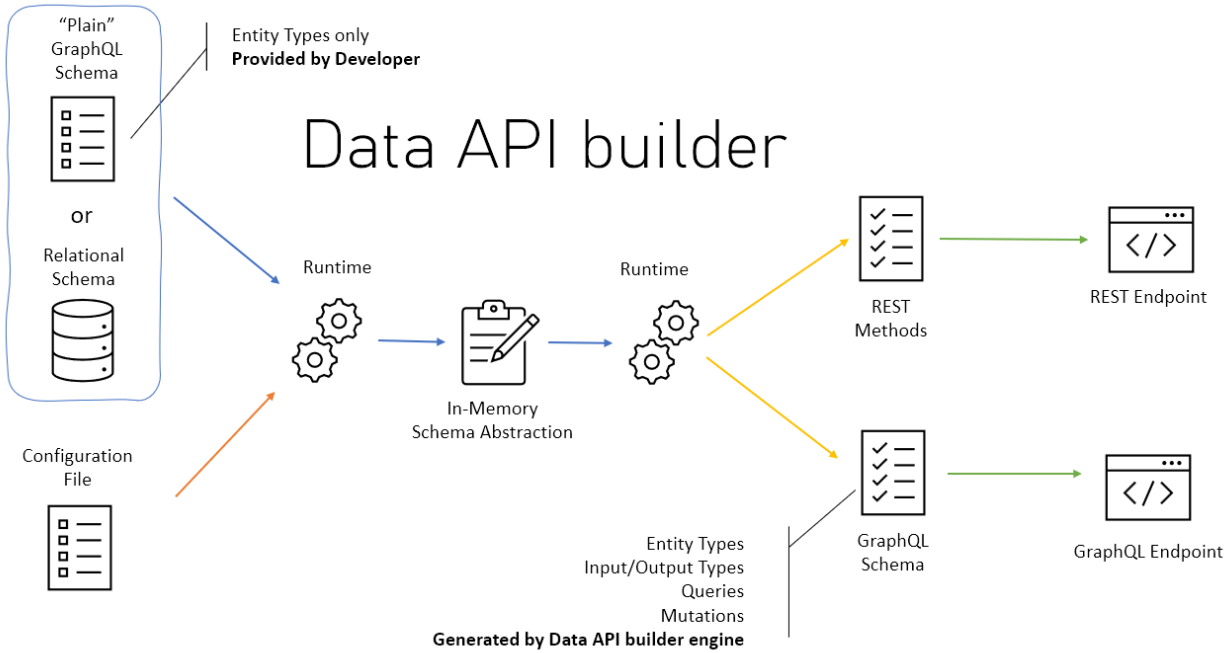
What is the Data API builder?

- Built **codeless** REST and GraphQL endpoints atop your databases
- Supports
  - Azure SQL, PostgreSQL, MySQL
  - Azure Cosmos DB
- Announced on the 15th of March
- Currently in Public Preview



Hosting Scenarios

- Azure Container Instances, Azure Container Instance Groups
- Azure Container Apps
- Static Web Applications
- Azure App Service for Containers
- Azure App Service
- Azure Kubernetes Service

Main features

- Expose collections, tables, views, and stored procedures as REST and GraphQL APIs
- REST features
  - CRUD operations via POST, GET, PUT, PATCH, DELETE
  - Filtering, sorting, and pagination (OData)
- GraphQL features
  - Queries and mutations
  - Filtering, sorting, and pagination
  - Relationship navigation
- Built-in authentication & authorization support
  - AzureAD, EasyAuth, JWT

Configuration File

- Defines backend database
- Defines global/runtime configuration
- Defines entities and security rules to access them
- Defines authentication method
- Defines relationships between entities (GraphQL)

Data API Builder CLI

- Distributed as NuGet package
- Install with *dotnet tool install –global Microsoft.DataApiBuilder*
- Create and manage runtime configuration file (optional)
- Develop and test locally

```
PS C:\> dab --help
Microsoft.DataApiBuilder 0.7.6+61de247acf65280d93783072226f695536591ffb
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  init        Initialize configuration file.

  add         Add a new entity to the configuration file.

  update      Update an existing entity in the configuration file.

  start       Start Data Api Builder Engine

  export      Export the GraphQL schema as a file and save to disk

  help        Display more information on a specific command.

  version     Display version information.
```

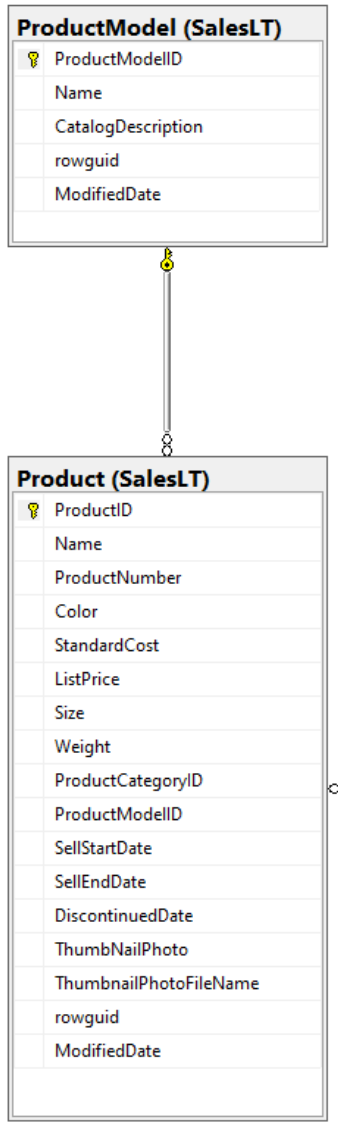
Demo 1

The basics

Adventure Works Schema

- SalesLT.ProductModel
  - Columns
    - ProductModelID (PK, int, not null)
    - Name (Name(nvarchar(50)), not null)
    - CatalogDescription (XML(.), null)
    - rowguid (uniqueidentifier, not null)
    - ModifiedDate (datetime, not null)
  - Keys
    - PK_ProductModel_ProductModelID

- SalesLT.Product
  - Columns
    - ProductID (PK, int, not null)
    - Name (Name(nvarchar(50)), not null)
    - ProductNumber (nvarchar(25), not null)
    - Color (nvarchar(15), null)
    - StandardCost (money, not null)
    - ListPrice (money, not null)
    - Size (nvarchar(5), null)
    - Weight (decimal(8,2), null)
    - ProductCategoryID (FK, int, null)
    - ProductModelID (FK, int, null)
    - SellStartDate (datetime, not null)
    - SellEndDate (datetime, null)
    - DiscontinuedDate (datetime, null)
    - ThumbNailPhoto (varbinary(max), null)
    - ThumbnailPhotoFileName (nvarchar(50), null)
    - rowguid (uniqueidentifier, not null)
    - ModifiedDate (datetime, not null)
  - Keys
    - PK_Product_ProductID
    - FK_Product_ProductCategory_ProductCategoryID
    - FK_Product_ProductModel_ProductModelID



- SalesLT.ProductCategory
  - Columns
    - ProductCategoryID (PK, int, not null)
    - ParentProductCategoryID (FK, int, null)
    - Name (Name(nvarchar(50)), not null)
    - rowguid (uniqueidentifier, not null)
    - ModifiedDate (datetime, not null)
  - Keys
    - PK_ProductCategory_ProductCategoryID
    - FK_ProductCategory_ProductCategory_Pare

Authentication

- Supported Identity Providers
  - Azure AD
  - StaticWebApps (EasyAuth)
- DAP checks audience in the JWT
- Unauthenticated request will be automatically assigned a system role called „anonymous“
- Authenticated requests will be automatically assigned a system role called „authenticated“
- After authentication the roles defined in the JWT are evaluated for authorization

Authorization

- DAB provides a role-based authorization workflow
- Incoming requests are assigned to a role, which is checked against configured permissions
- Supports session context to send user specified metadata to the underlying database (MSSQL-specific)
  - RLS, SESSION_CONTEXT

Permissions

- Defines which roles can access an entity by using which actions
- Actions can be “create, read, update, delete”

Roles

- Two types of roles
- System roles
  - “anonymous” and “authenticated”
- User roles
  - Requires “X-MS-API-ROLE” in the header
  - Request is only evaluated in the context of a single role

Demo 2

Authentication & Authorization

REST API & Query Parameters

- Projection => $select
- Filtering => $filter
- Sorting => $orderby
- Pagination => $first and $after

GraphQL API

- Queries and mutations
- Filtering
- Sorting
- Pagination
- Relationship navigation

```
select top 10
    p.ProductID,
    p.Name,
    p.Color,
    pc.Name as CategoryName
from SalesLT.Product as p
join SalesLT.ProductCategory as pc
on p.ProductCategoryID = pc.ProductCategoryID;
```

Demo 3

OData & GraphQL

Demo 4

Hosting with Azure Container Instances

Requirements

- Azure Storage Account with File Share
- Data API Builder Configuration
- Container Instance YAML definition

Wrapping up...

- DAB allows to rapidly expose REST and GraphQL APIs
- Currently in preview
- Supports Azure SQL, Postgres, MySQL and CosmosDB
- Supports authentication and authorization with roles and permissions
- Comes with OData query parameters to project, filter and sort (REST)
- Allows for queries, mutations, filtering, sorting and relationship navigation
- Either built from source or run from container image

Question & Answers

Thanks for your attention

Further reading and links

- Data API Builder - Public Preview Announcement
- GitHub Data API Builder
- Tutorial: Creating & securing codeless REST API on Azure using Data API Builder
- Tutorial: Secure your codeless REST API with automatic HTTPS with Caddy