

Utilizing Azure Mobile App Services

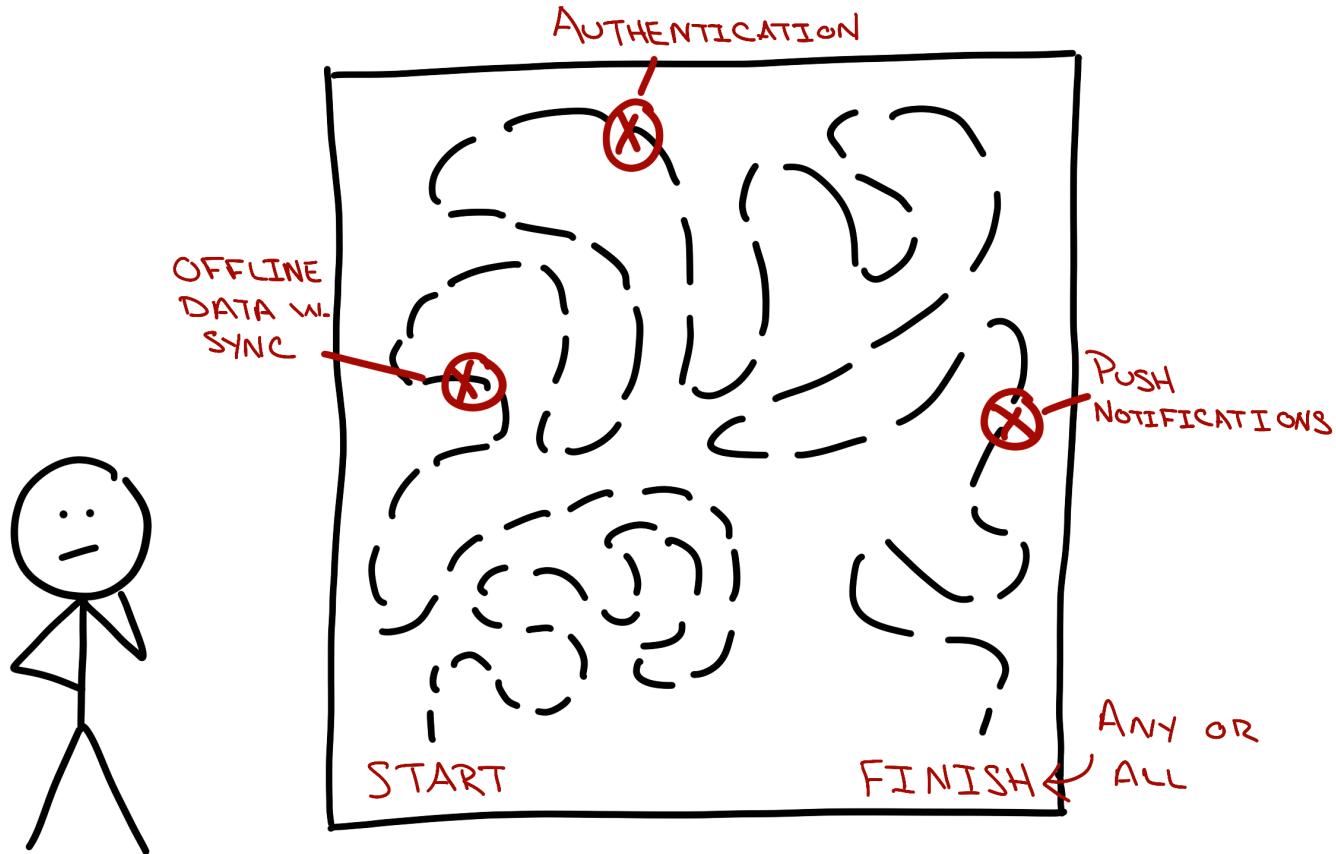


Matthew Soucoup

PRINCIPAL

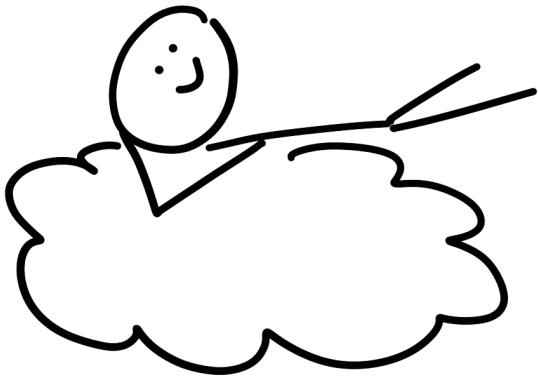
@codemillmatt codemilltech.com

What is Azure Mobile App Services?



What are Azure Mobile Apps Services?

Robust mobile app



Server-side

OData

Authentication

Notification



Client-side

Offline data

Caching

Push registration

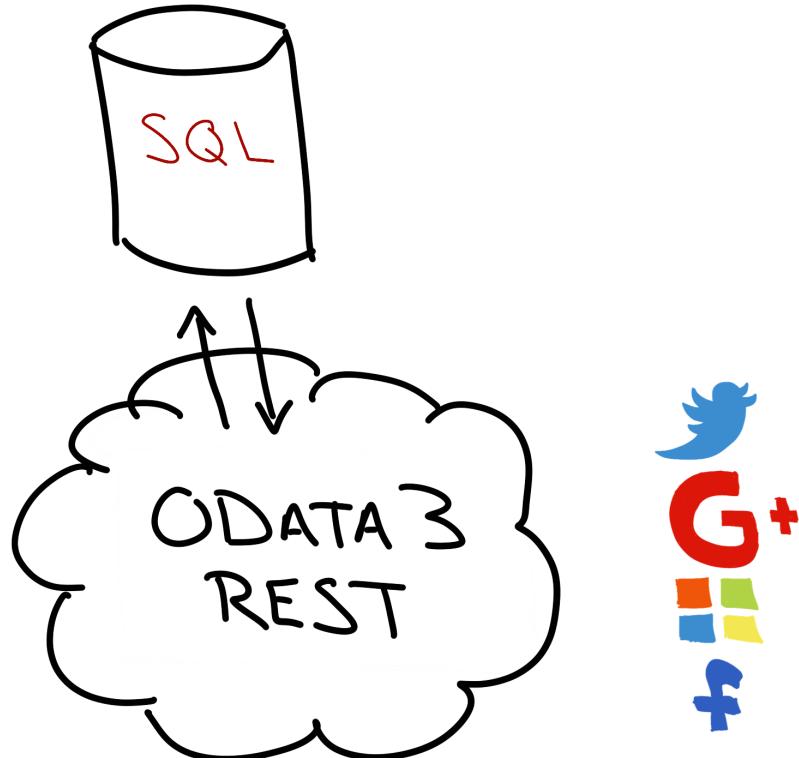
Server-side



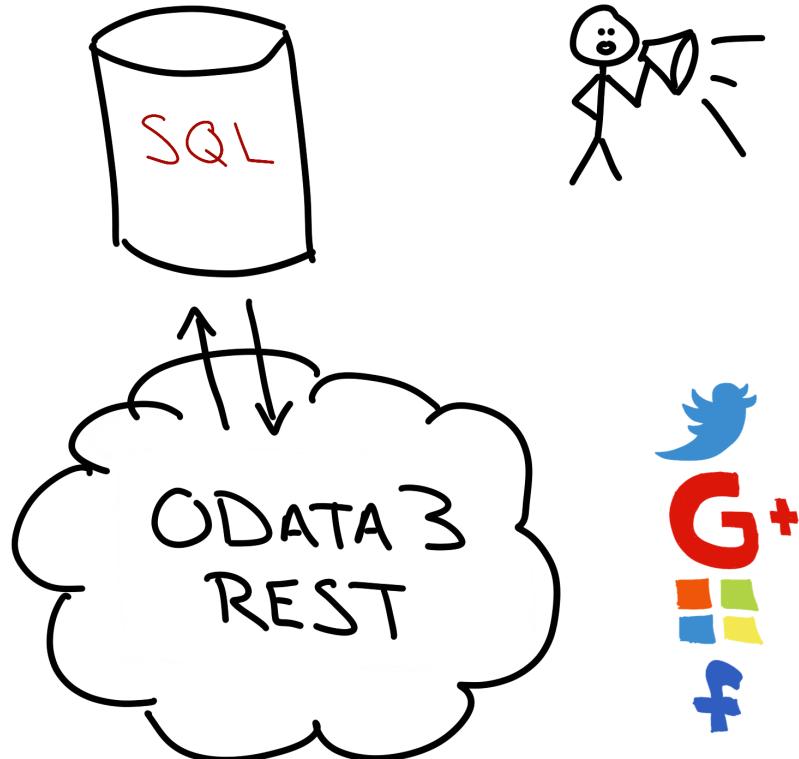
Server-side



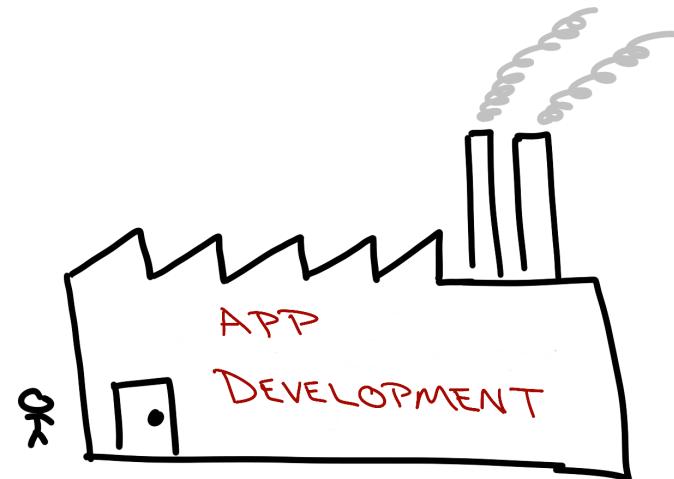
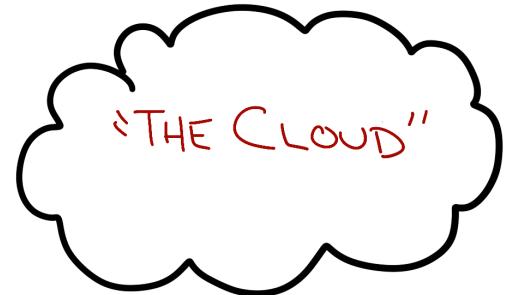
Server-side



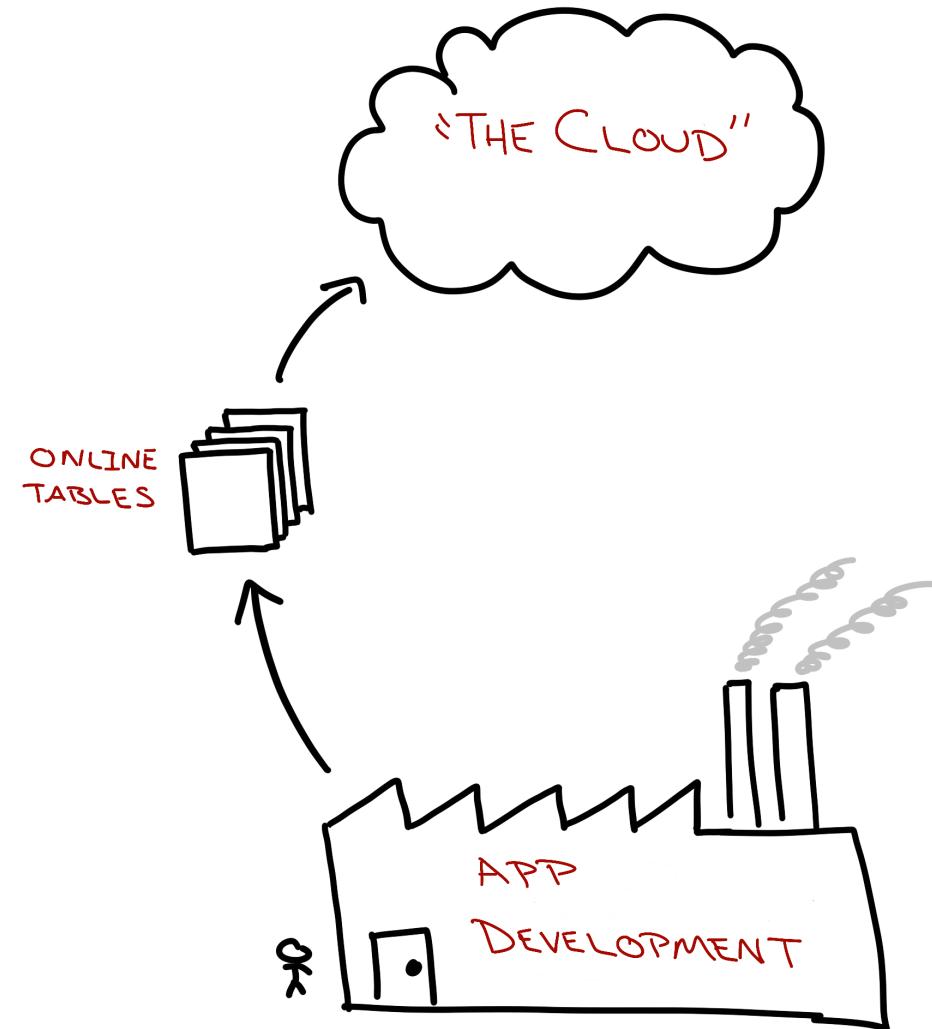
Server-side



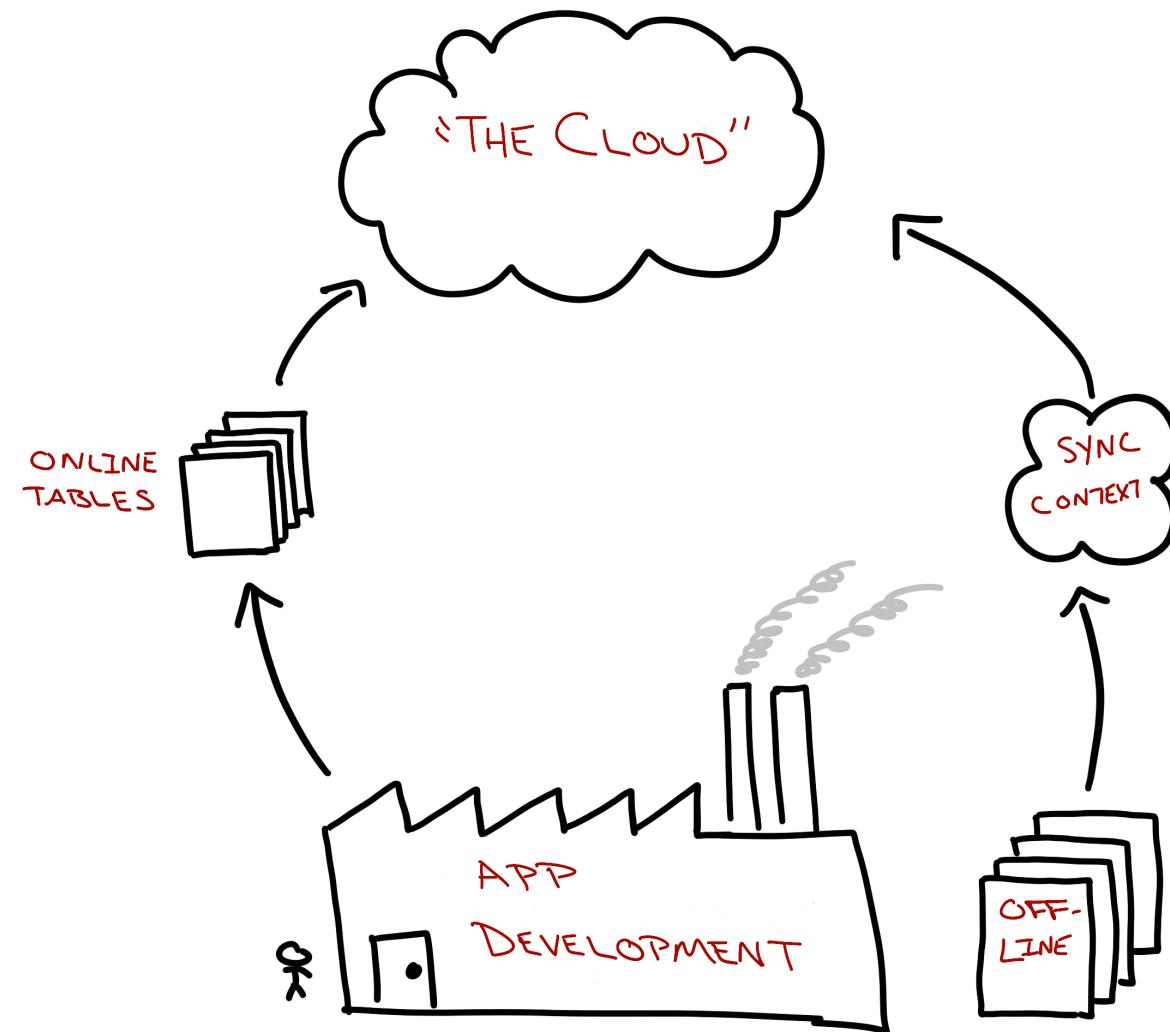
Client-side



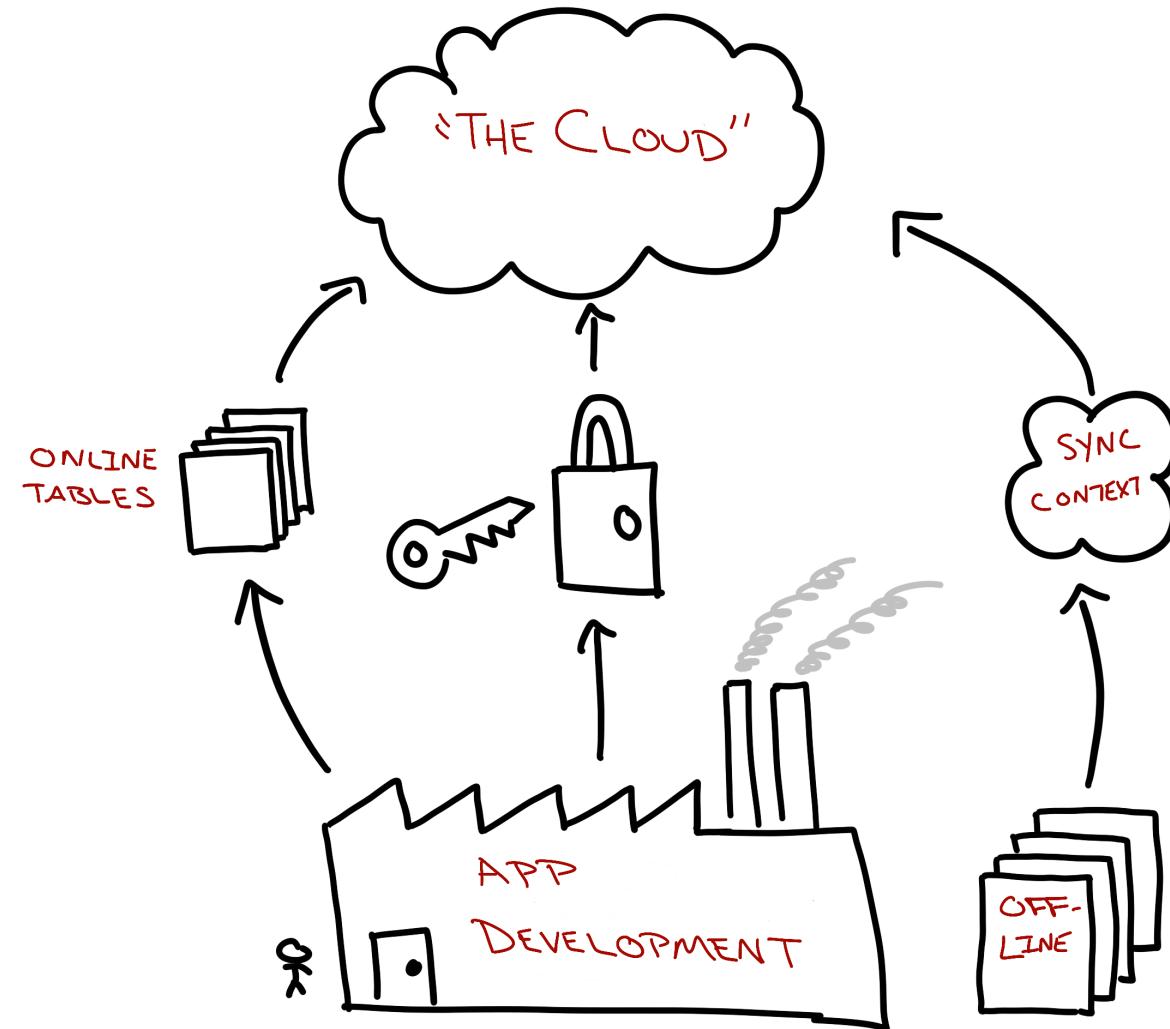
Client-side



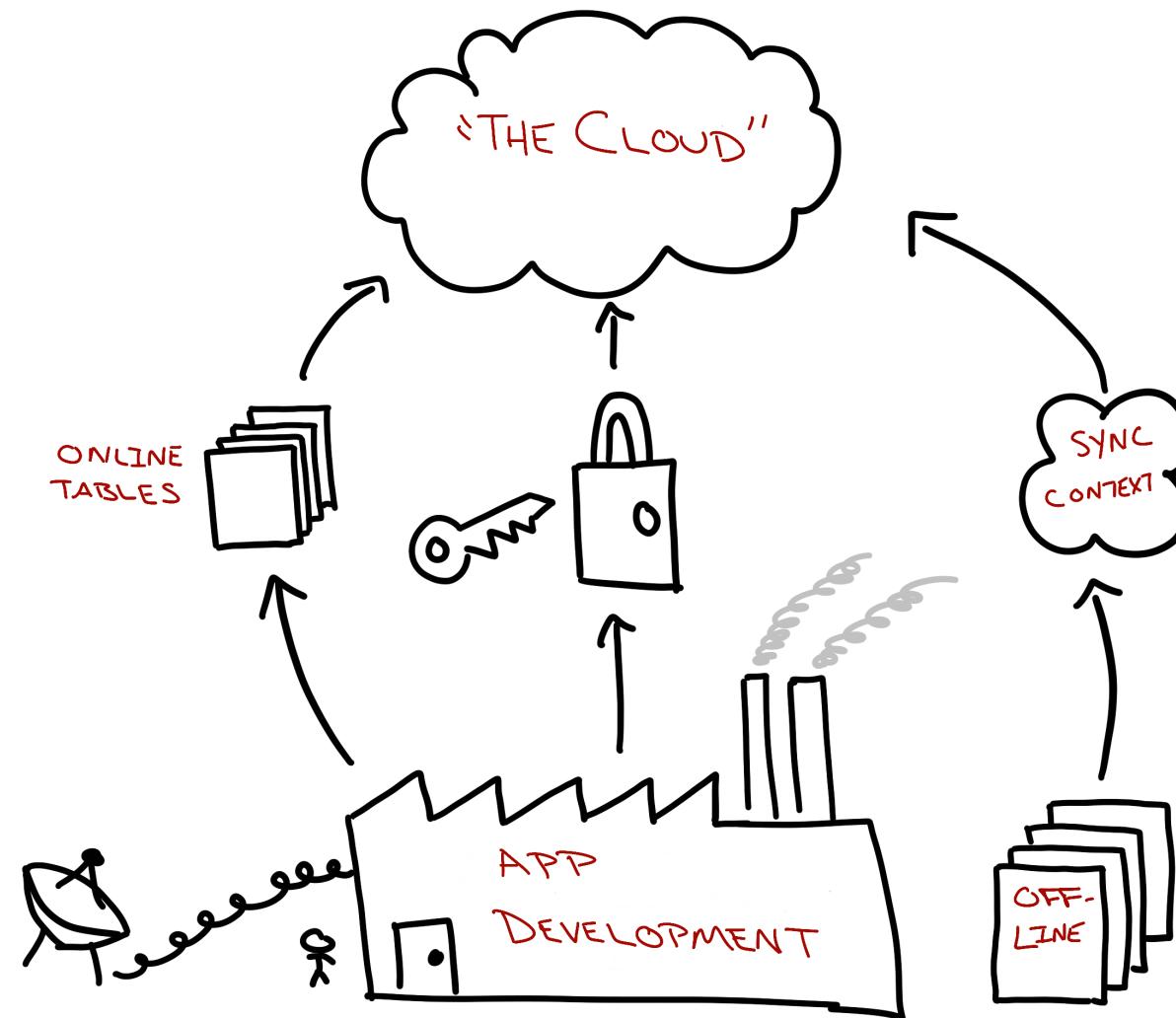
Client-side



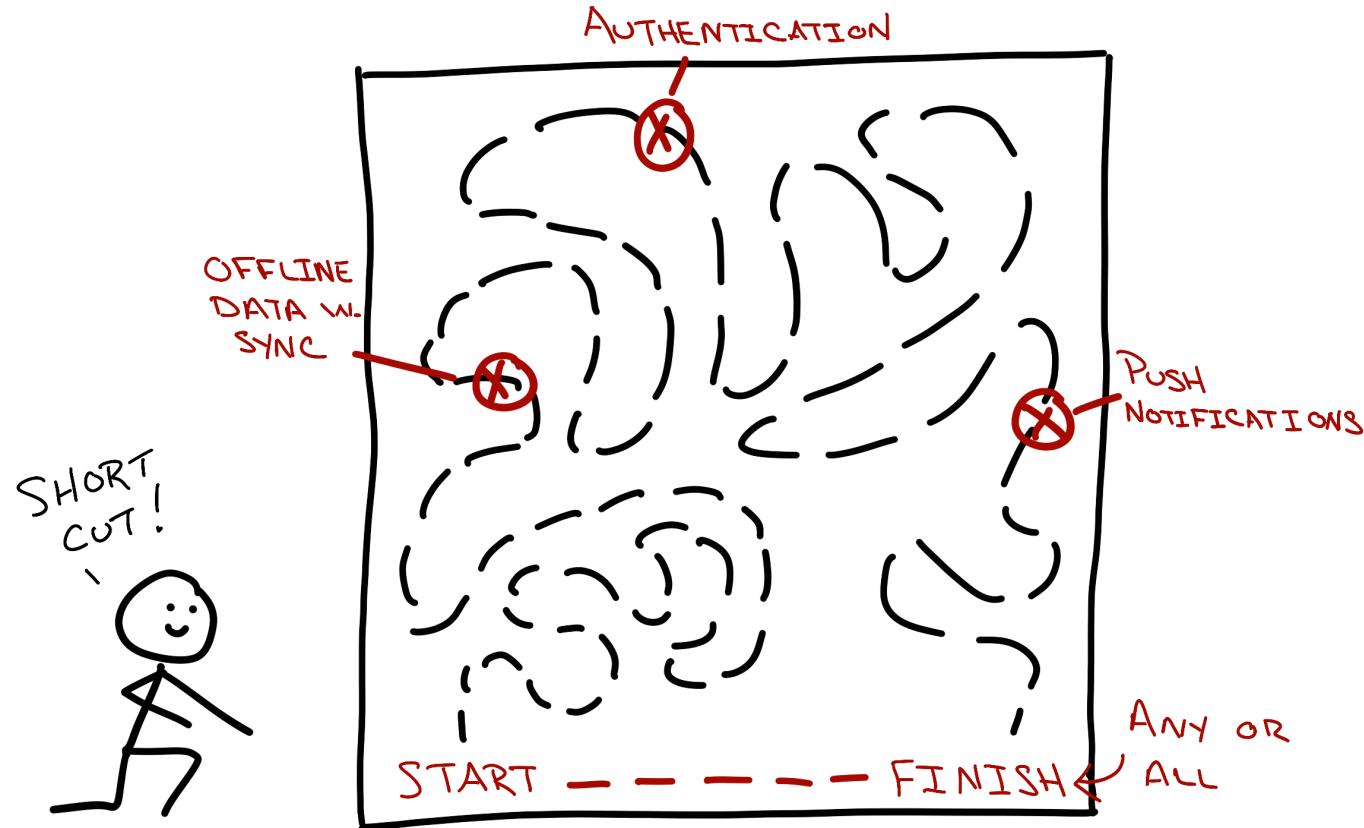
Client-side



Client-side



What are Azure Mobile App Services?



What are Azure Mobile App Services?

A short cut to building robust, scalable, offline-enabled mobile apps with cloud based infrastructure.

Foodie

Carrier 5:56 PM

Recipes

Easy

Breakfast

Eggs Benedict



5 min prep 24 min cook serves 8

[View Recipe >](#)

Medium

RECOMMENDED

Blueberry Muffins

Prep: 10 min Cook: 25 min

Lunch

Burger



5 min prep 20 min cook serves 4

[View Recipe >](#)

Hard



Carrier 10:19 AM

Recipes  Details Edit

Blueberry Muffins



10 min prep 25 min cook serves 12

Breakfast

** Medium difficulty **

Ingredients

1 cup whole wheat white flour
1 tbsp baking powder
1 tbsp cinnamon
1 1/2 cup milk
2 beaten eggs
1 stick of butter, melted
1 cup fresh blueberries
1 tsp vanilla extract
12 paper muffin cups liners
whole oats and sunflower seeds to sprinkle (optional)



Agenda

Setup

Data (with offline sync)

Authentication

Push notifications

Setup

Dashboard +

← → ⏪ | 🔒 portal.azure.com/#

Microsoft Azure

Dashboard ▾ + New dashboard ⚙ Edit dashboard 📁 Share ↗ Fullscreen ⌂ Clone 🗑 Delete

All resources ALL SUBSCRIPTIONS

| | |
|---|------------------|
|  indy-code-practice | SQL server |
|  indy-code-practice | SQL database |
|  indy-code-hub | Notification Hub |

App Services - Microsoft +

← → ⌂ | portal.azure.com/#blade/HubsExtension/Resources/resourceType/Microsoft.Web%2Fsites

Microsoft Azure App Services

App Services msoucoupcodemilltech (Default Directory)

+ Add Columns Refresh

Subscriptions: All 3 selected – Don't see a subscription? Switch directories

Filter by name... All subscriptions

2 items

| NAME | RESOURCE GROUP | STATUS | SUBSCRIPTION | APP TYPE | APP SERVICE PLAN |
|--------------------|-----------------------|---------|-------------------|------------|------------------|
| codemill-mail | codemill-mail-rg | Running | BizSpark-CodeMill | Web app | codemill-mail-sp |
| indy-code-practice | indy-code-practice... | Running | BizSpark-CodeMill | Mobile app | codemill-mail-sp |

msoucoup@codemillt... MSOUCOUPCODEMILLTECH (...

This screenshot shows the Microsoft Azure App Services blade. The left sidebar contains icons for various services: App Services (selected), Functions, Logic Apps, Container Registry, App Configuration, Key Vault, Application Insights, and Cloud Shell. The main area displays a table of two app services. The first service, 'codemill-mail', is a Web app running in the 'codemill-mail-rg' resource group under the 'BizSpark-CodeMill' subscription, using the 'codemill-mail-sp' app service plan. The second service, 'indy-code-practice', is a Mobile app running in the 'indy-code-practice...' resource group under the same subscription, also using the 'codemill-mail-sp' app service plan. Both services are currently running. A red box highlights the '+ Add' button in the top-left corner of the blade.

Web + Mobile - Microsoft Azure

portal.azure.com/#blade/Microsoft_Azure_Marketplace/GalleryFeaturedMenuItemBlade/selectedCategory/1

Microsoft Azure App Services > Web + Mobile

Web + Mobile

Filter: Mobile App

Results

| NAME | PUBLISHER | CATEGORY |
|-------------------------------------|-------------------|----------------|
| Mobile App | Microsoft | Mobile Apps |
| Mobile Engagement | Microsoft | Mobile Apps |
| aiMobile Mobile Acceleration -BYOL | aiScaler | Media services |
| aiMobile Mobile Acceleration-HOURLY | aiScaler | Media services |
| The Identity Hub | U2U Consult NV/SA | Add-ons |
| Pydio Enterprise version 7.0.4 | Abstrium | Media services |
| myFIdoc | Cordis Solutions | Media services |

Related to your search ▾

- Notification Hub Microsoft
- BES12 v12.4 Base Image BlackBerry

Mobile App - Microsoft +

← → ⌂ | portal.azure.com/#create/Microsoft.Zumo

Microsoft Azure App Services > Web + Mobile > Mobile App > Mobile App

Mobile App Create

* App name CoolestAppEver ✓

* Subscription Visual Studio Enterprise

* Resource Group ⓘ
● Create new ○ Use existing
CoolestAppEver-RG ✓

* App Service plan/Location
CoolestAppEver-SP(North Centra...)

Application Insights ⓘ On Off

Pin to dashboard

Create Automation options

msoucoup@codemillt...
MSOUCOUPCODEMILLTECH (...)

App Services - Microsoft +

← → ⏪ ⏩ | 🔒 portal.azure.com/#blade/HubsExtension/Resources/resourceType/Microsoft.Web%2Fsites

Microsoft Azure App Services msoucoup@codemilltech... MSOUUCOUPCODEMILLTECH ...

App Services msoucoup@codemilltech (Default Directory)

+ Add Columns Refresh

Subscriptions: All 3 selected – Don't see a subscription? Switch directories

Filter by name... All subscriptions

3 items

| NAME | RESOURCE GROUP | STATUS | SUBSCRIPTION | APP TYPE | APP SERVICE PLAN |
|--------------------|-----------------------|---------|-------------------------|------------|-------------------|
| codemill-mail | codemill-mail-rg | Running | BizSpark-CodeMill | Web app | codemill-mail-sp |
| CoolestAppEver | CoolestAppEver-RG | Running | Visual Studio Enterp... | Mobile app | CoolestAppEver-SP |
| Indy-code-practice | Indy-code-practice... | Running | BIZspark-CodeMill | Mobile app | codemill-mail-sp |

The screenshot shows the Microsoft Azure App Services blade. On the left is a vertical navigation bar with icons for various services. The main area displays a table of three selected subscriptions. The table has columns for NAME, RESOURCE GROUP, STATUS, SUBSCRIPTION, APP TYPE, and APP SERVICE PLAN. The rows for 'codemill-mail', 'CoolestAppEver', and 'Indy-code-practice' are highlighted with a red box. The 'codemill-mail' row is also highlighted with a blue box at the bottom.

| NAME | RESOURCE GROUP | STATUS | SUBSCRIPTION | APP TYPE | APP SERVICE PLAN |
|--------------------|-----------------------|---------|-------------------------|------------|-------------------|
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Xamarin.Forms - Micros +

← → ⏪ ⏩ | 🔒 portal.azure.com/#resource/subscriptions/e87bee3f-5a48-4748-b725-bcc261eeb8cd/resourceG | 📄 ⭐ | ⚙️ 🌐 ⏷ ⏵ ⏴ ⏵ ⏵

Microsoft Azure App Services > CoolestAppEver - Quickstart > Xamarin.Forms

Search (Ctrl+ /) Filter settings

GENERAL

- iOS (Objective-C)
- iOS (Swift)
- Android
- Windows (C#)
- Windows 8.1 (C#)
- Xamarin.Android
- Xamarin.iOS
- Xamarin.Forms
- Cordova

CoolestAppEver - Quickstart

Xamarin.Forms Quick start

1 Connect a database

i You will need a database in order to create one.

2 Create a table API

! To store data in your backend, you can follow below and create a TodoItem table.

Backend language: C# Download

Once you've downloaded your personalized solution, open it in Visual Studio. Right-click the project and select "Publish". Select the Azure backend. The TodoItem table will be created automatically.

3 Configure your client application

CREATE A NEW APP CONNECT AN EXISTING APP

On a Windows PC: [Install Visual Studio Community](#)

On a Mac or Windows PC: [Install Xamarin for Mac](#)

Download your personalized Xamarin project, or Xamarin Studio. The app is pre-configured for you.

Search (Ctrl+ /) Filter settings

GENERAL

- iOS (Objective-C)
- iOS (Swift)
- Android
- Windows (C#)
- Windows 8.1 (C#)
- Xamarin.Android
- Xamarin.iOS
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Data - Server

Data Flow

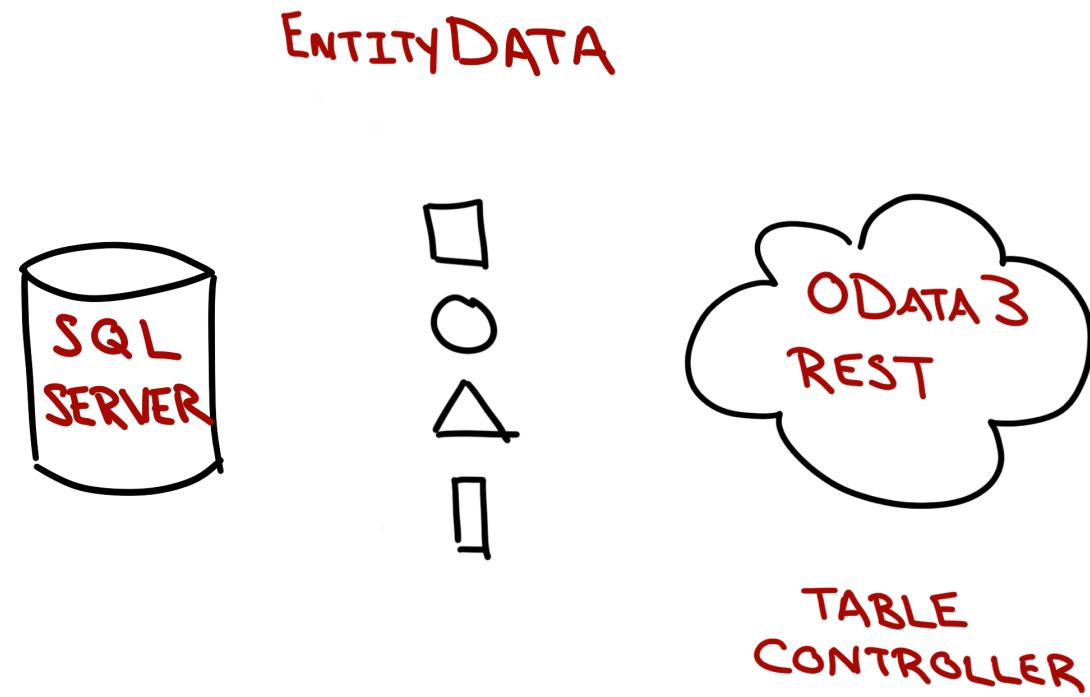


Data Flow

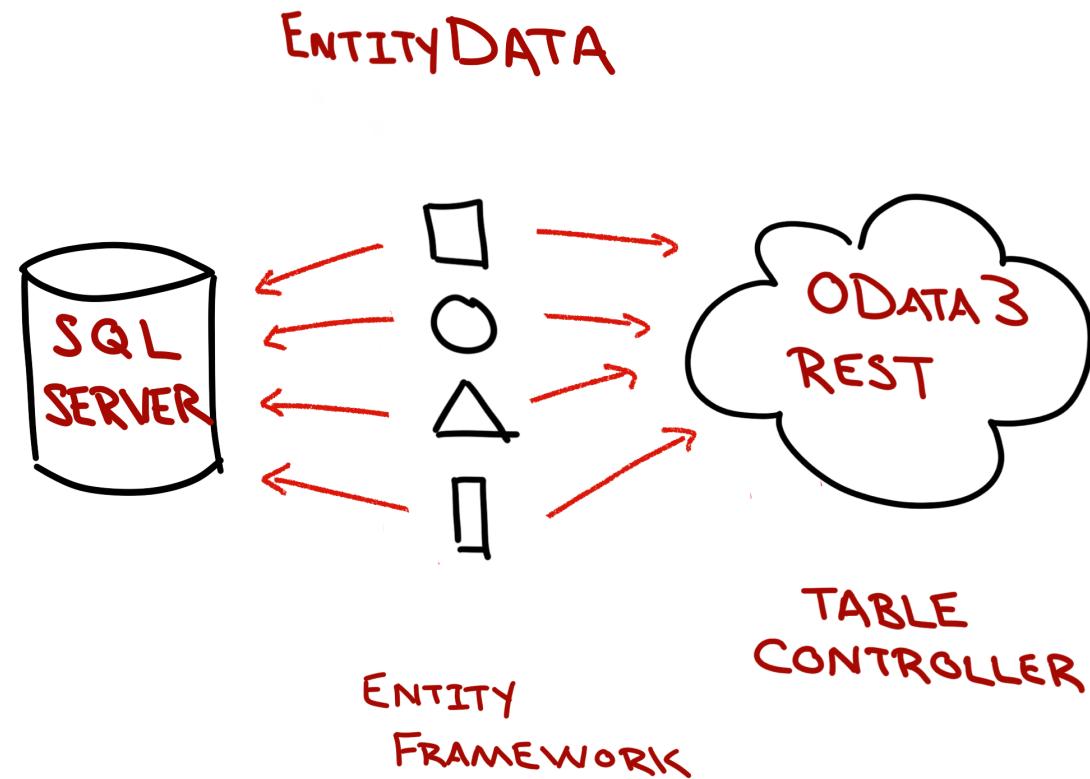
ENTITY DATA



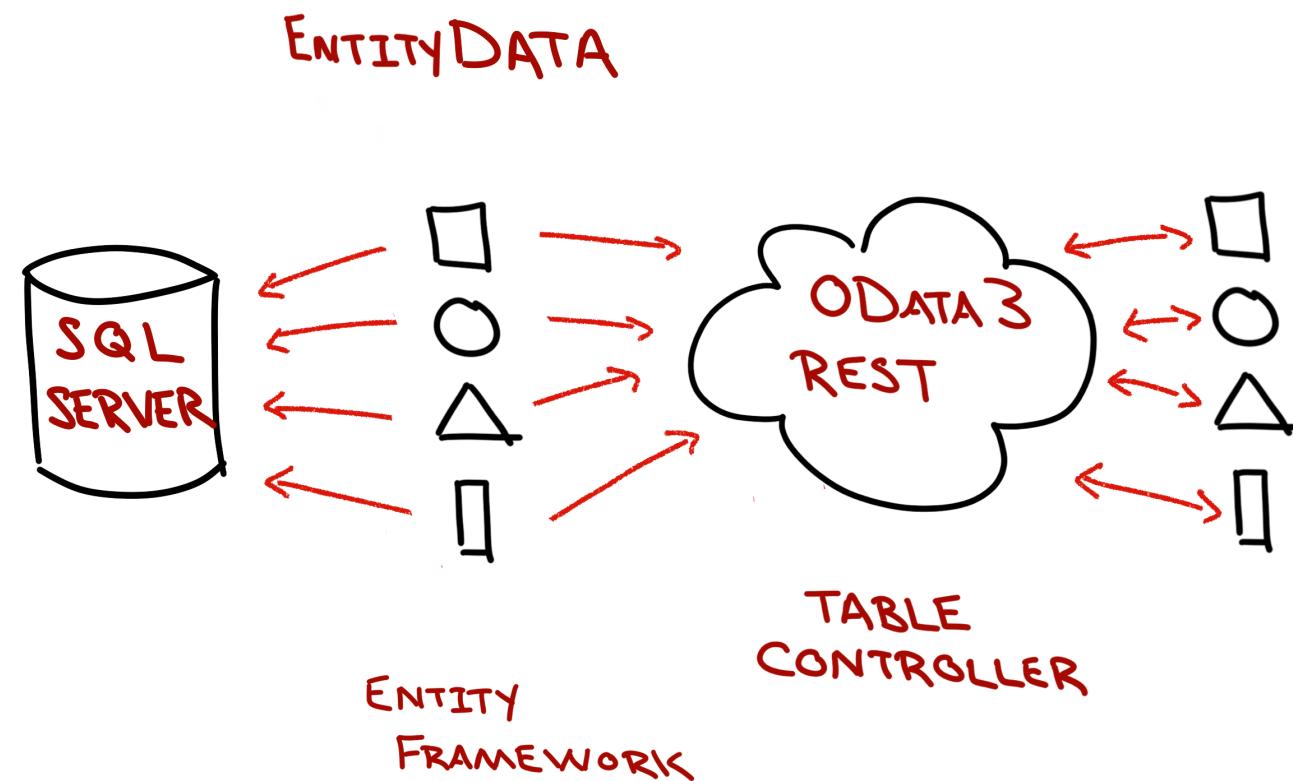
Data Flow



Data Flow



Data Flow



EntityData – System Columns

Id

CreatedAt

UpdatedAt

Deleted

Version

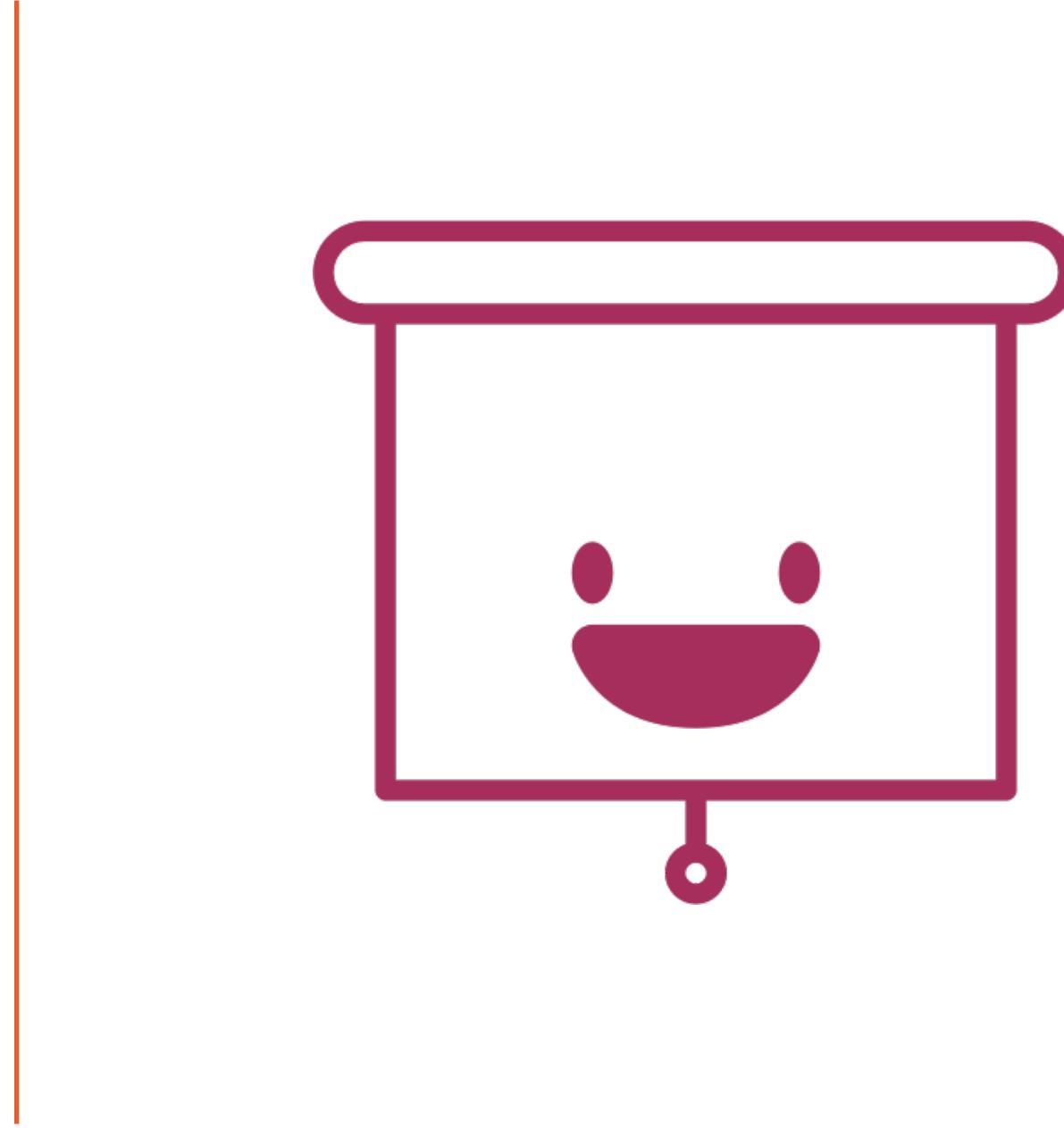
Create Table Controller

POCO inherit
EntityData

Table controller
(from template)

Perform code first
migration

Server-side data



```
public class RecipeController : TableController<Recipe>
{
    protected override void Initialize(HttpControllerContext controllerContext)
    {
        base.Initialize(controllerContext);
        MobileServiceContext context = new MobileServiceContext();
        DomainManager = new EntityDomainManager<Recipe>(context, Request);
    }

    public IQueryable<Recipe> GetAllRecipes()
    {
        return Query();
    }

    public SingleResult<Recipe> GetRecipe(string id)
    {
        return Lookup(id);
    }

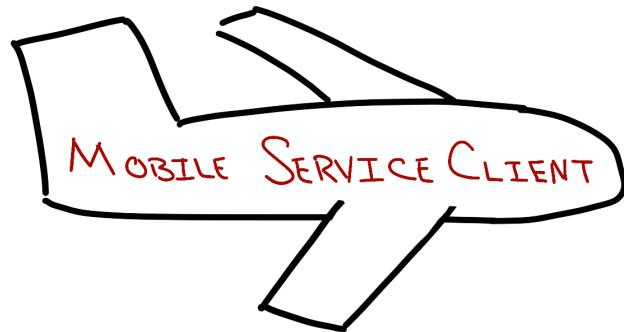
    public Task<Recipe> PatchRecipe(string id, Delta<Recipe> patch)
    {
        return UpdateAsync(id, patch);
    }

    public async Task<IHttpActionResult> PostRecipe(Recipe item)
    {
        Recipe current = await InsertAsync(item);
        return CreatedAtRoute("Tables", new { id = current.Id }, current);
    }

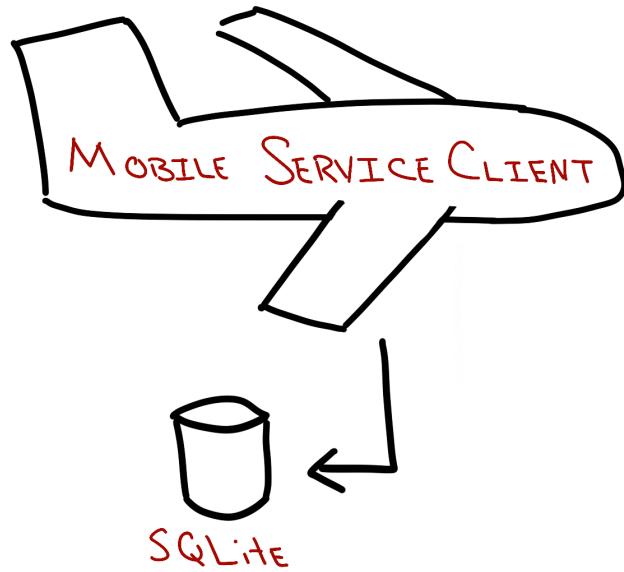
    public Task DeleteRecipe(string id)
    {
        return DeleteAsync(id);
    }
}
```

Data - Client

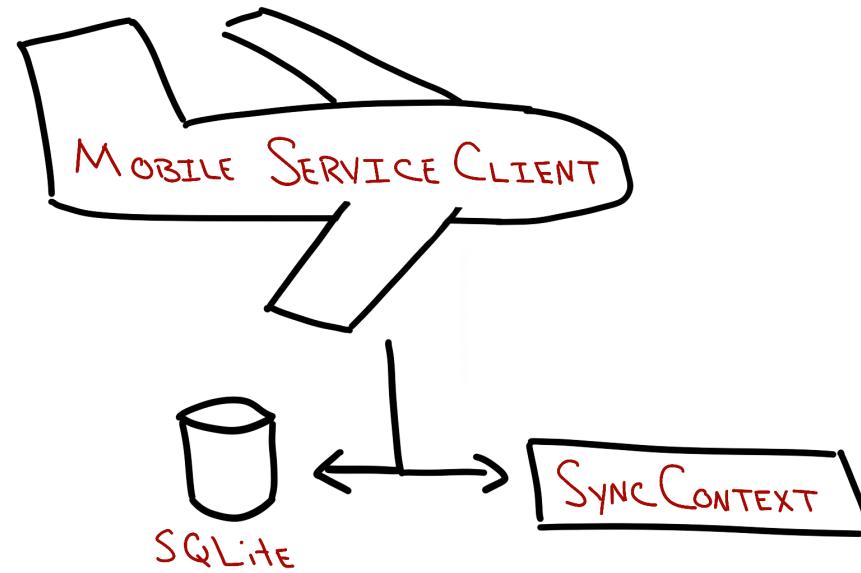
Data Flow



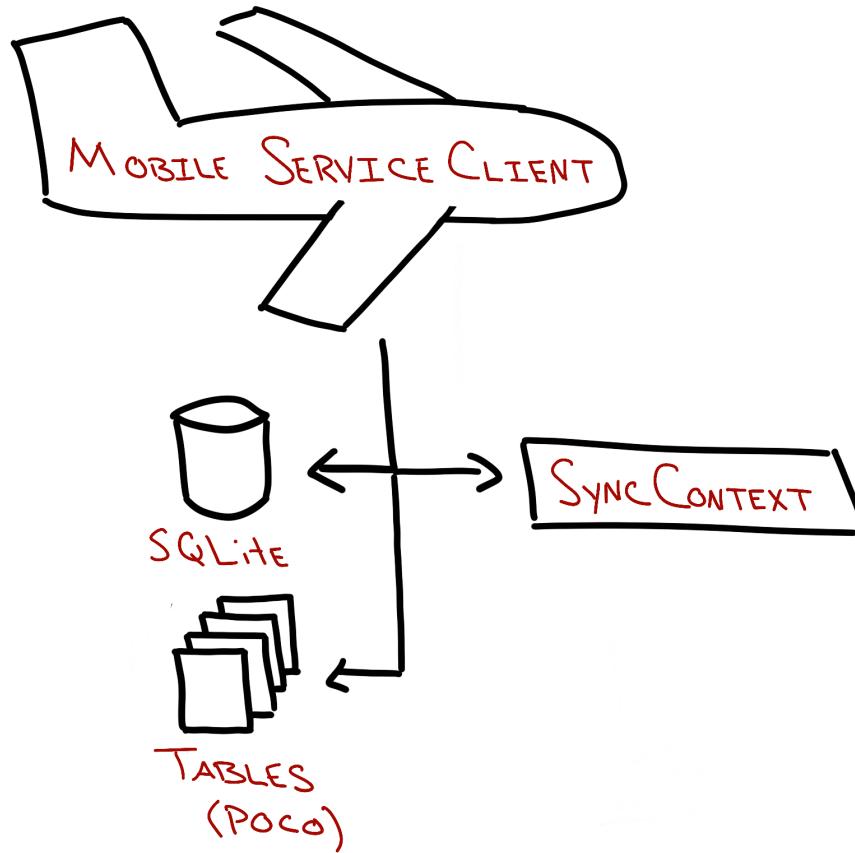
Data Flow



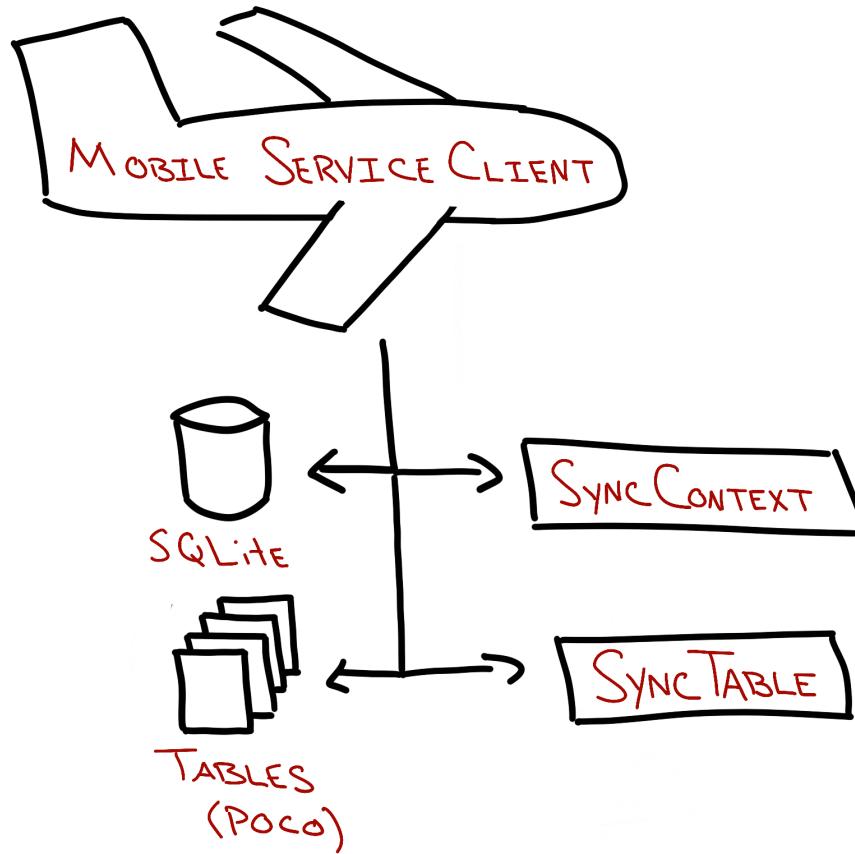
Data Flow



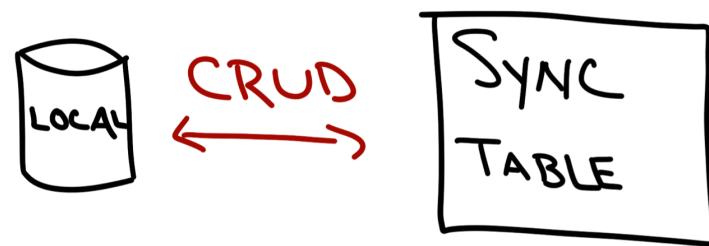
Data Flow



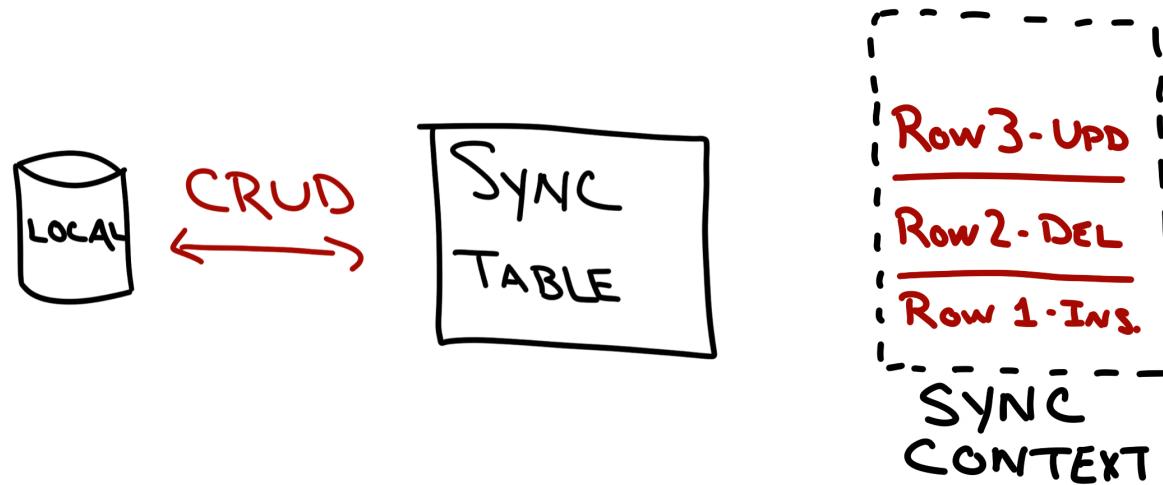
Data Flow



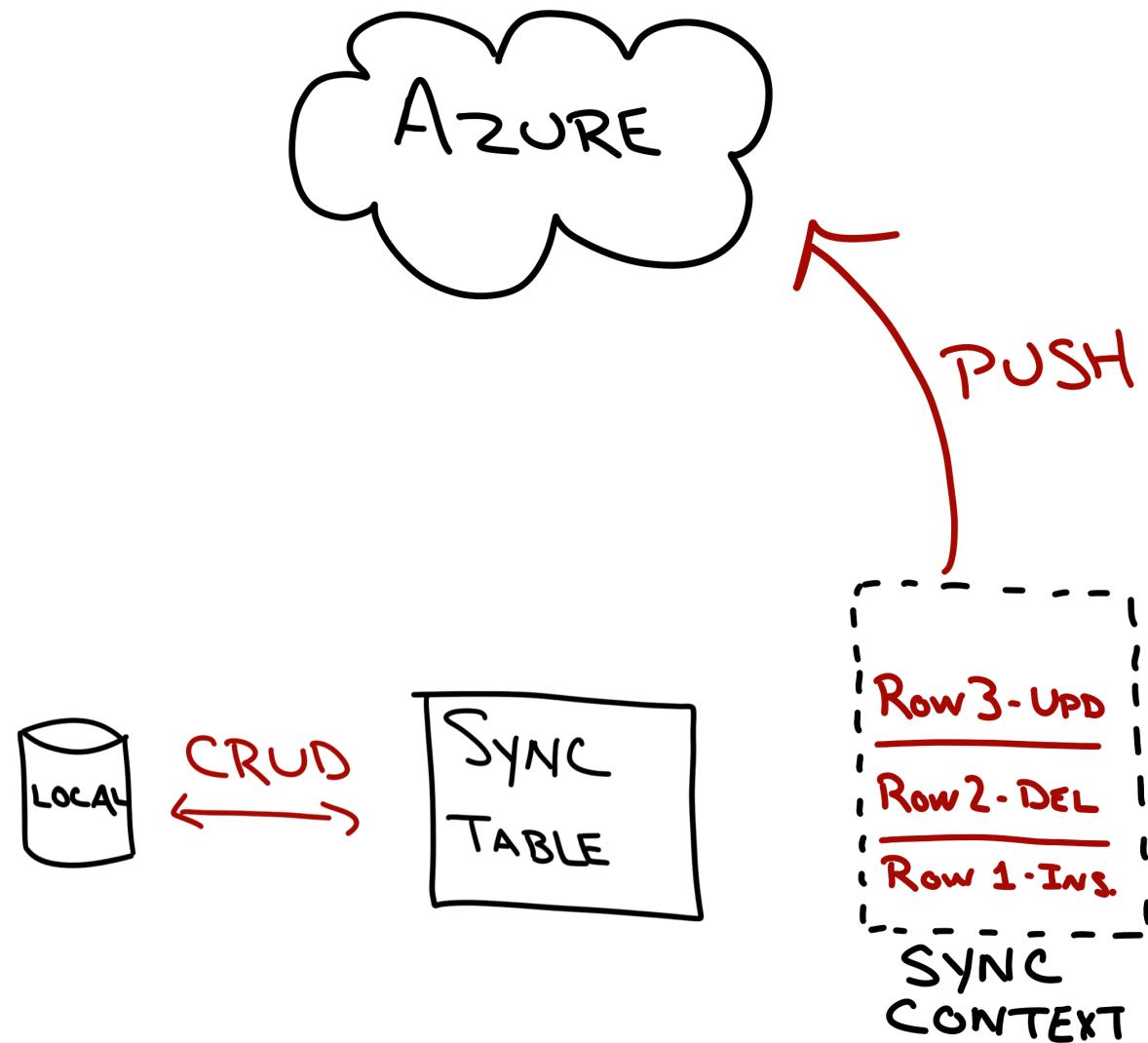
Data Flow



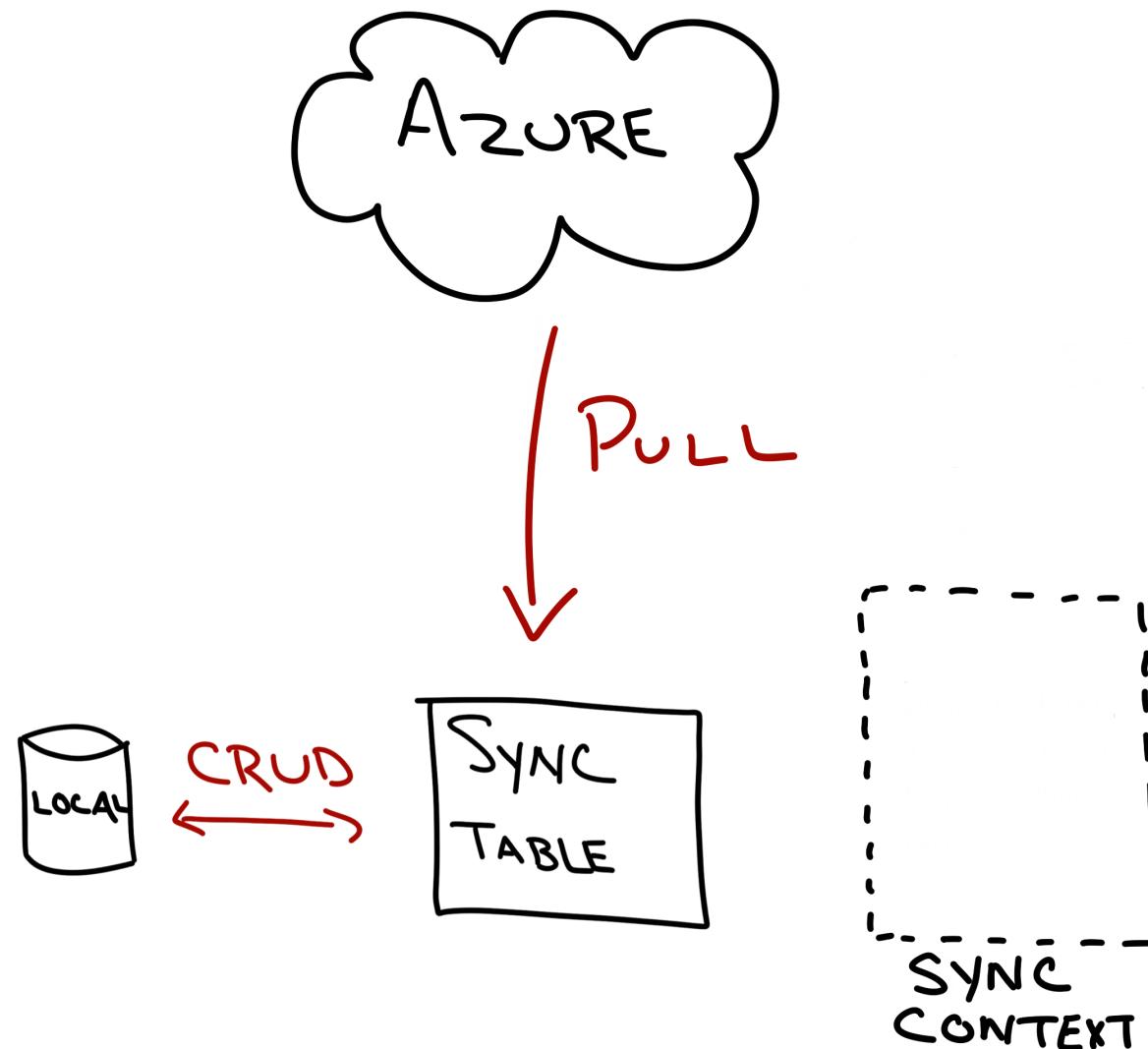
Data Flow



Data Flow



Data Flow



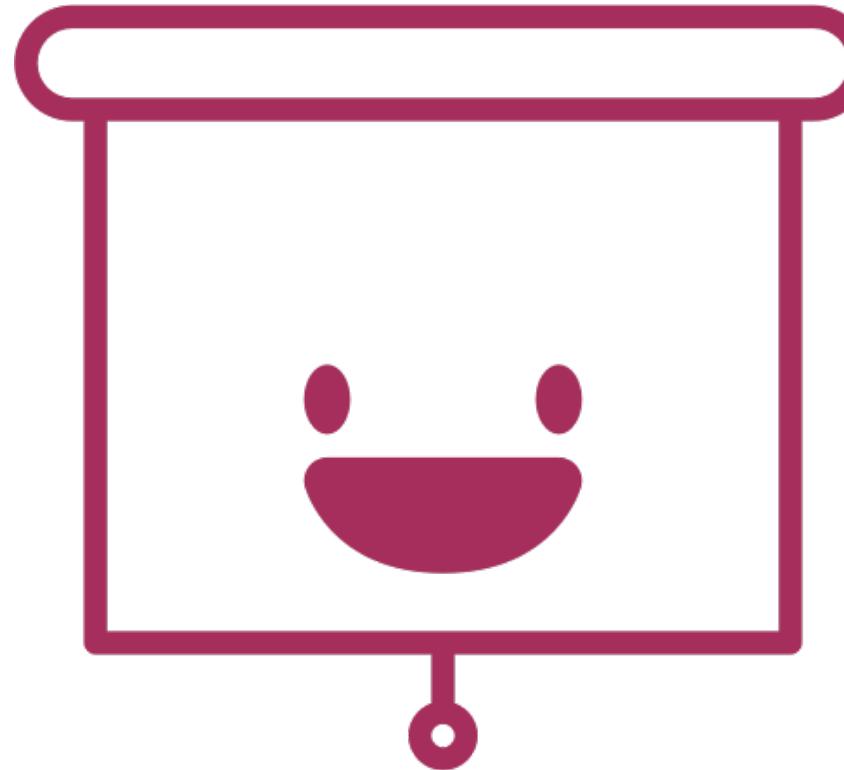
Client Data

All CRUD against
local database

Push to send
modified data

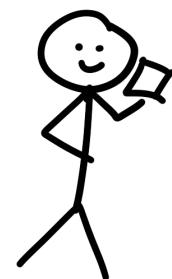
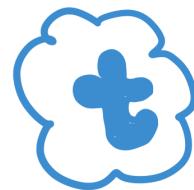
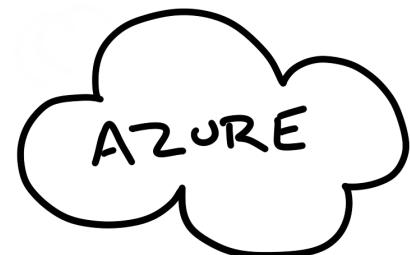
Pull for new data
(implicit push)

Client-side data

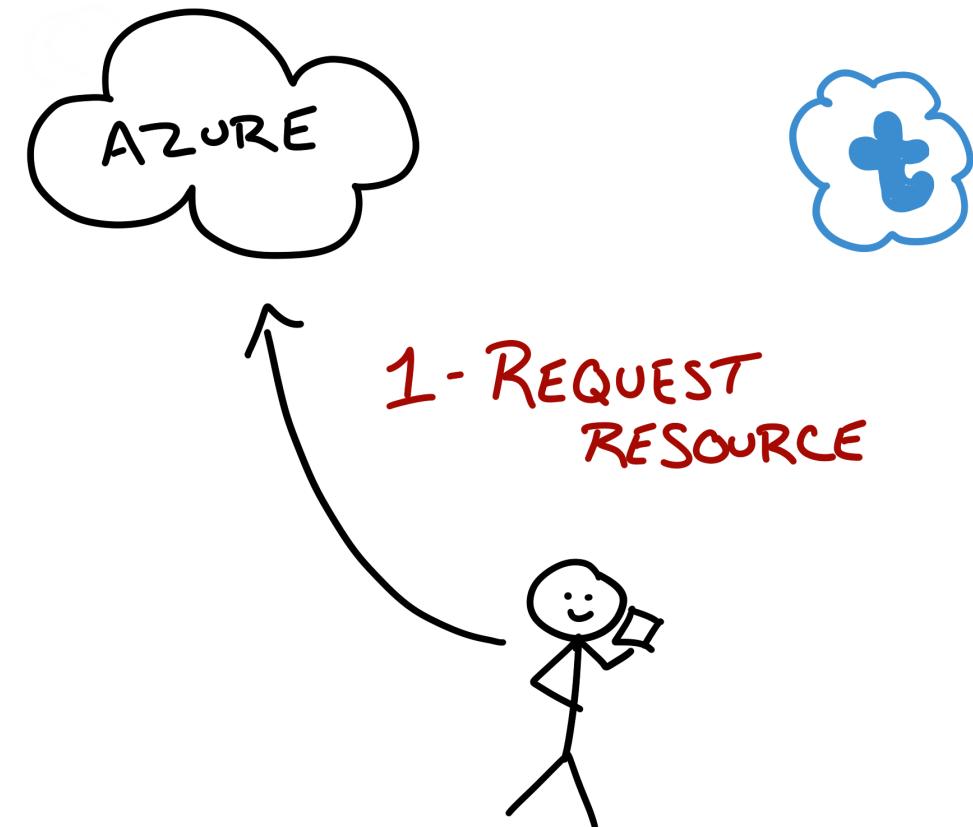


Authentication

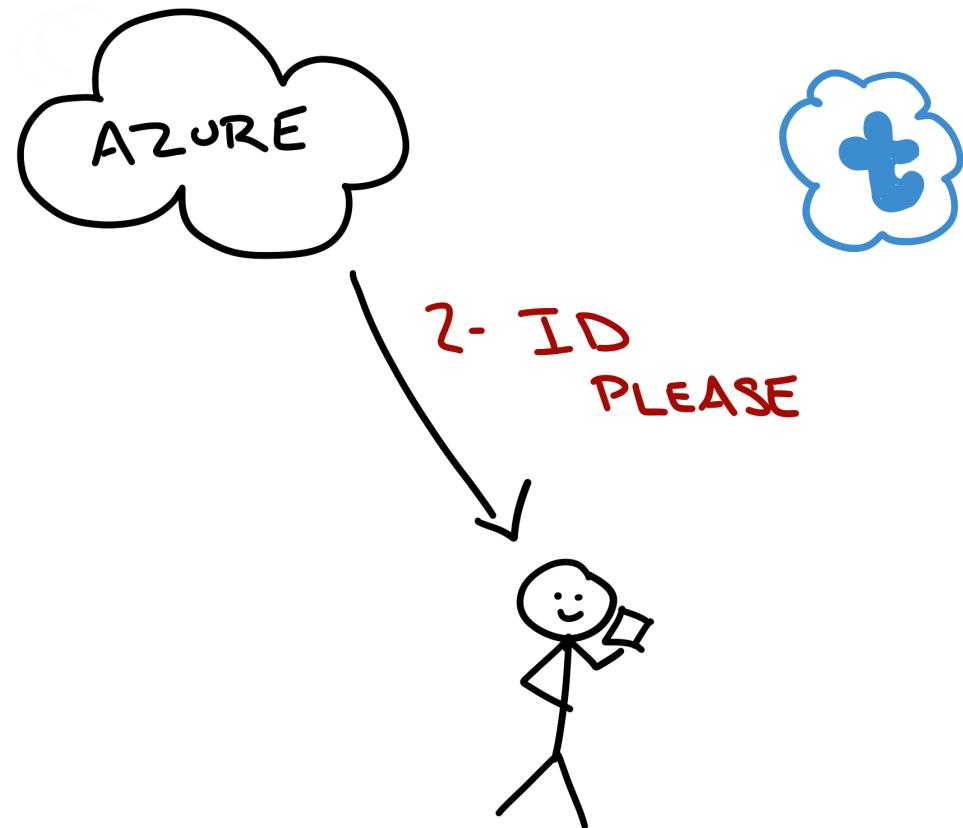
OAuth



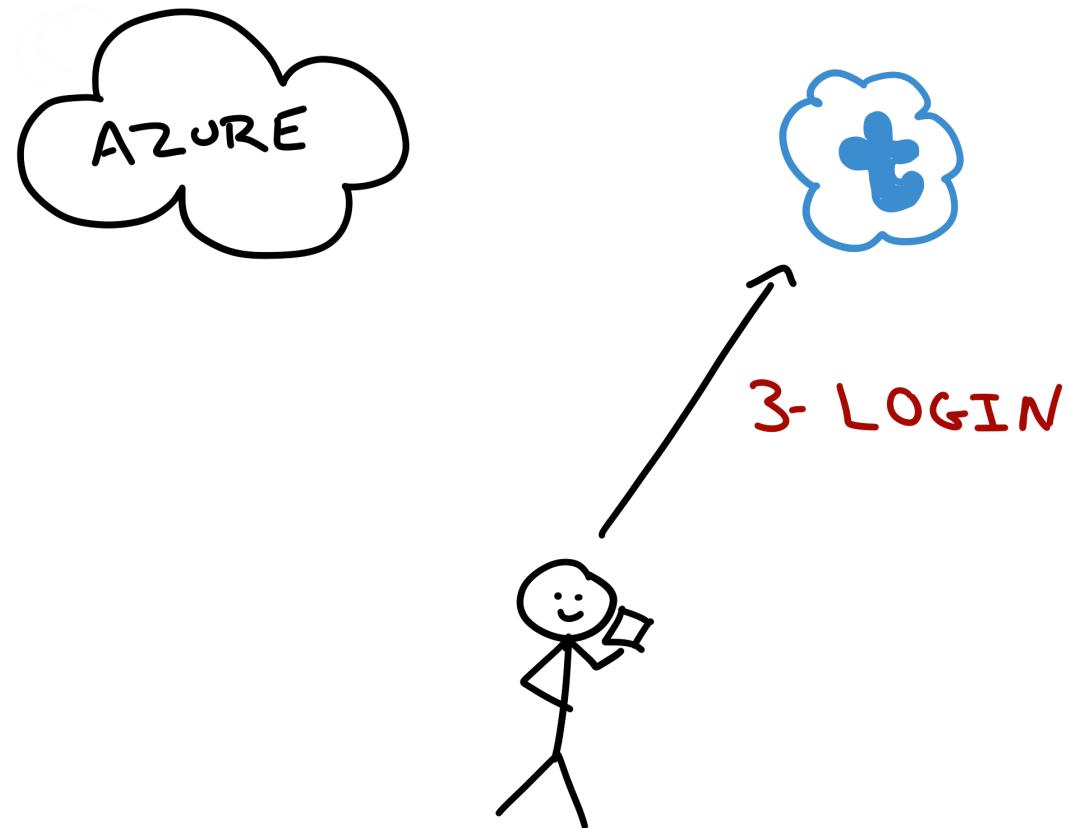
OAuth



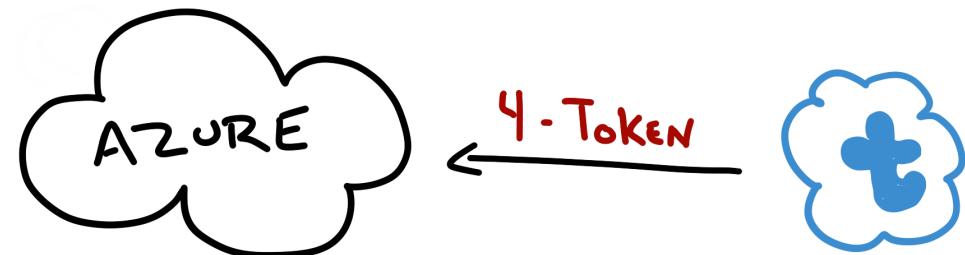
OAuth



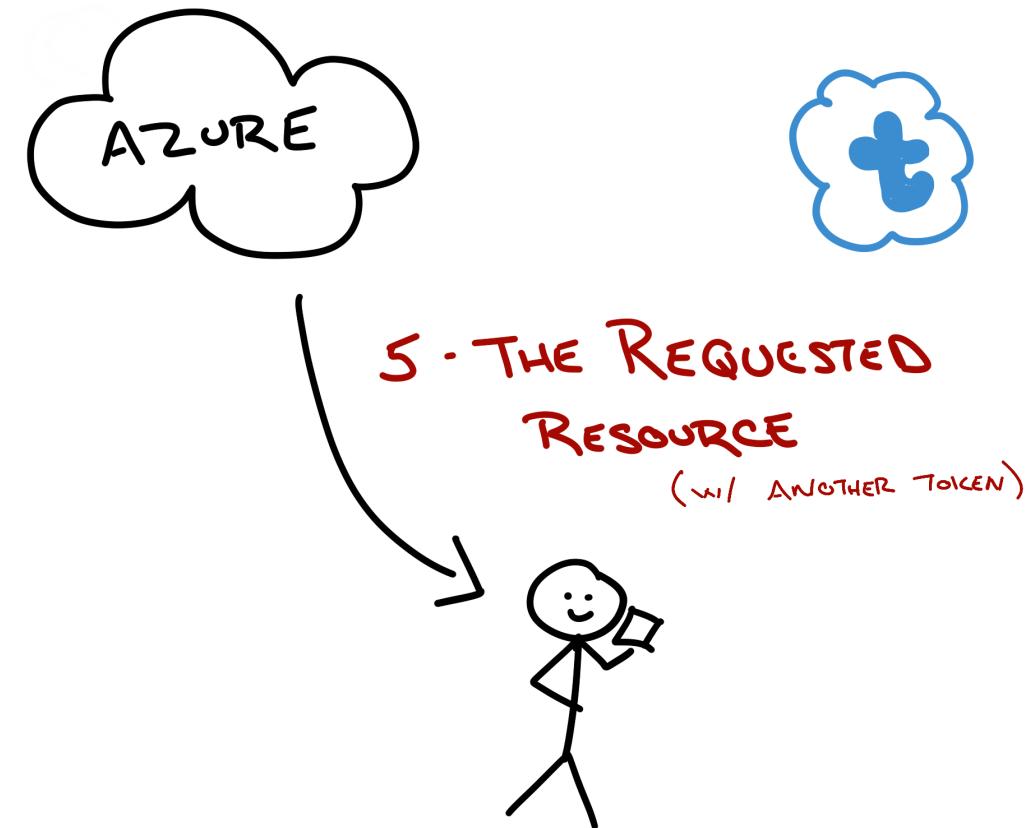
OAuth



OAuth



OAuth



Azure Auth Setup

 Application Management 

FoodieAzureAuth

[Test OAuth](#)

[Details](#) [Settings](#) [Keys and Access Tokens](#) [Permissions](#)

Application Settings

Keep the "Consumer Secret" a secret. This key should never be human-readable in your application.

| | |
|------------------------------|--|
| Consumer Key (API Key) | liwZXW4lgx0MihaSargfzxOJr |
| Consumer Secret (API Secret) | SIf4LZQy58gZH6LtgbIjRyurmE9mUVsiLOmUAn3ZdlhFBexw5p |
| Access Level | Read-only (modify app permissions) |
| Owner | CodeMillMatt |
| Owner ID | 20019868 |

Azure Setup

Microsoft Azure App Services > indy-code-practice - Authentication / Authorization > Twitter Authentication Settings

Save Discard

Authentication / Authorization

Anonymous access is enabled on the App Service app. Users will not be prompted for login.

App Service Authentication: On

Action to take when request is not authenticated: Allow Anonymous requests (no action)

Authentication Providers

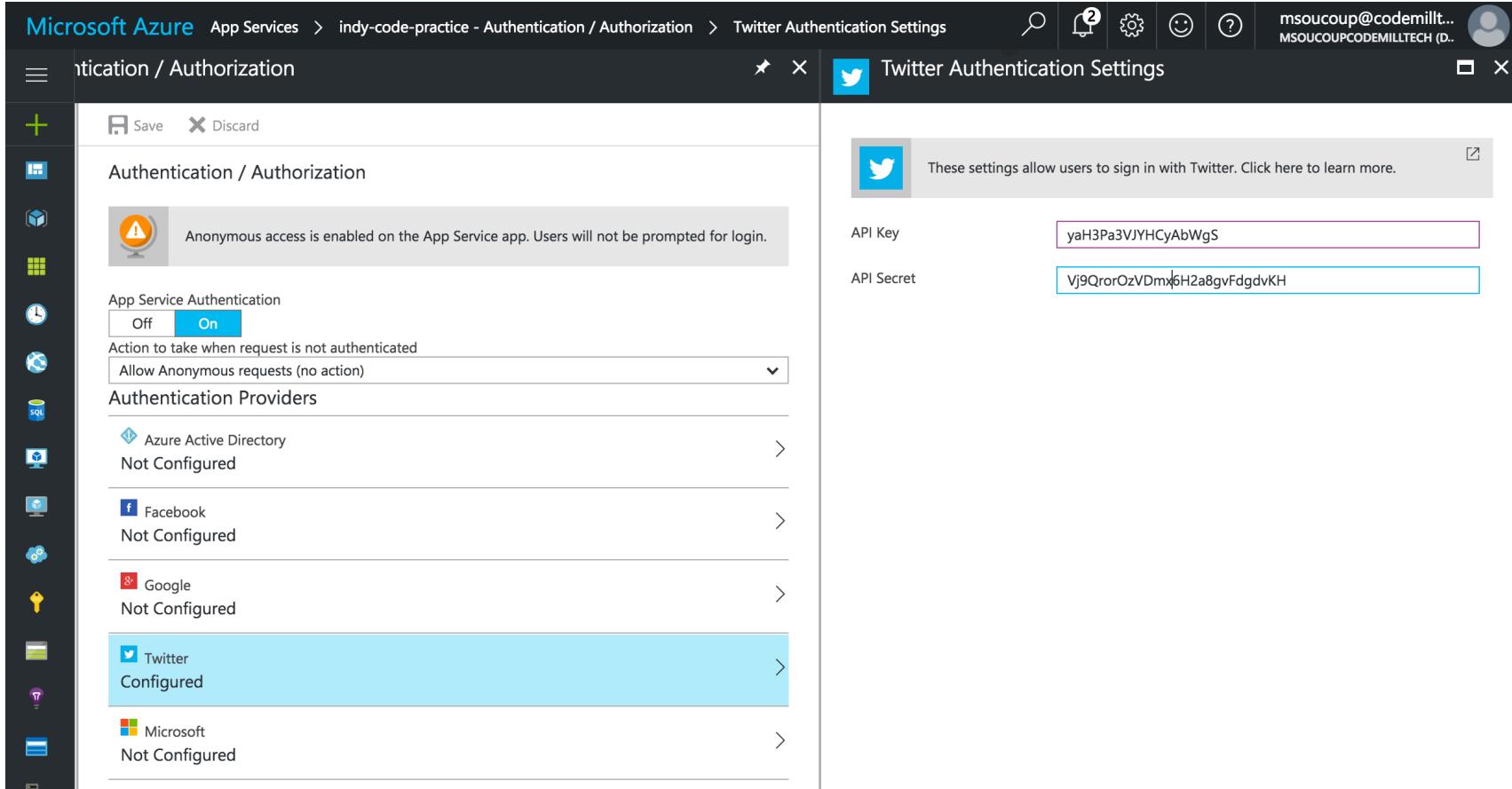
- Azure Active Directory: Not Configured
- Facebook: Not Configured
- Google: Not Configured
- Twitter: Configured**
- Microsoft: Not Configured

Twitter Authentication Settings

These settings allow users to sign in with Twitter. Click here to learn more.

API Key: yaH3Pa3VJYHCyAbWgS

API Secret: Vj9QrorOzVDmx6H2a8gvFdgdvKH



```
[Authorize]
public class RecipeController : TableController<Recipe>
{
    ...
}
```

Enforcing Authentication

Authorize attribute

Class level

Method level

```
public string UserID
{
    get
    {
        var principal = this.User as ClaimsPrincipal;
        return principal.FindFirst(ClaimTypes.NameIdentifier)
            .Value;
    }
}
```

Checking Authorization

User property

Return appropriate claim

```
public async Task<IHttpActionResult> PostRecipe(Recipe item)
{
    item.UserId = UserID;

    Recipe current = await InsertAsync(item);
    return CreatedAtRoute("Tables", new { id = current.Id },
                          current);
}
```

Checking Authorization - Post

Create new property for UserId

Set UserId to claim before save

```
public IQueryable<Recipe> GetAllRecipe()
{
    return Query().Where(sr => sr.UserId.Equals(UserID));
}
```

Checking Authorization - Get

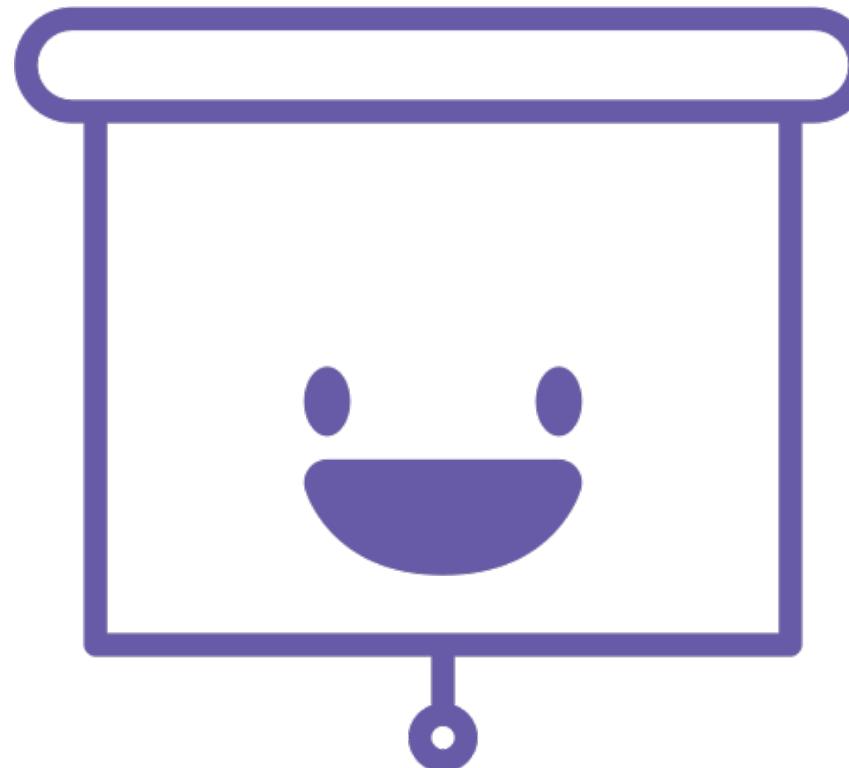
Verify UserId property matches claim

Do same for other HTTP verbs

Client Authentication



Authentication
Authorization



Push Notifications

Server Setup



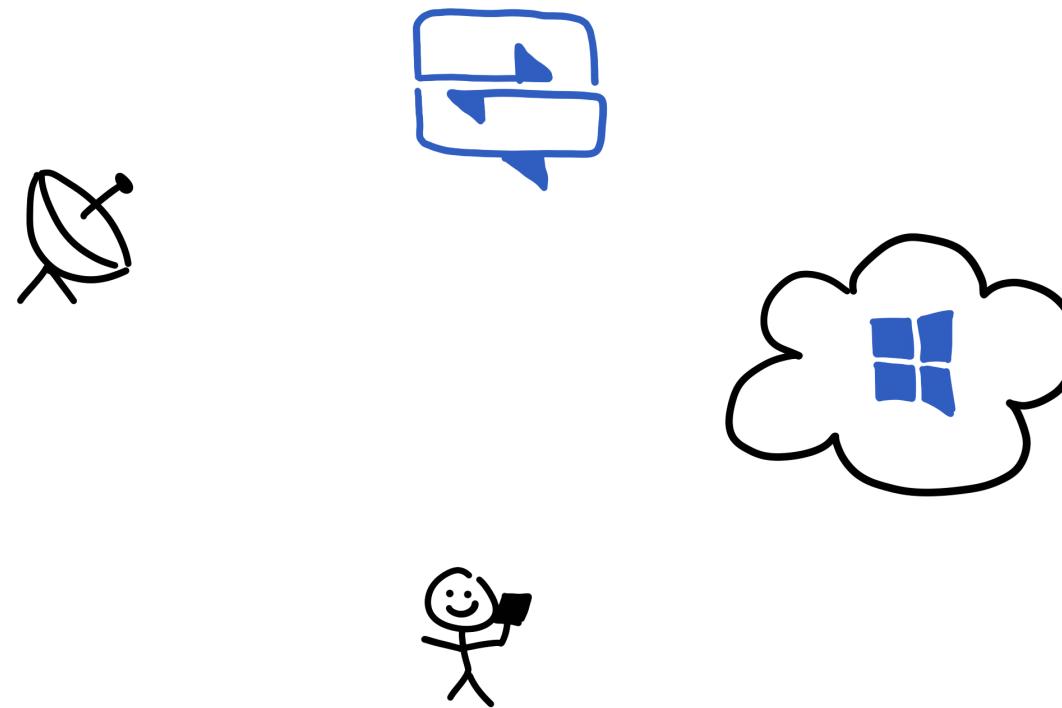
For a Push to Happen...

Each device has
unique ID

APNS, FCM, WNS
creates it

Azure Notification
Hub needs it

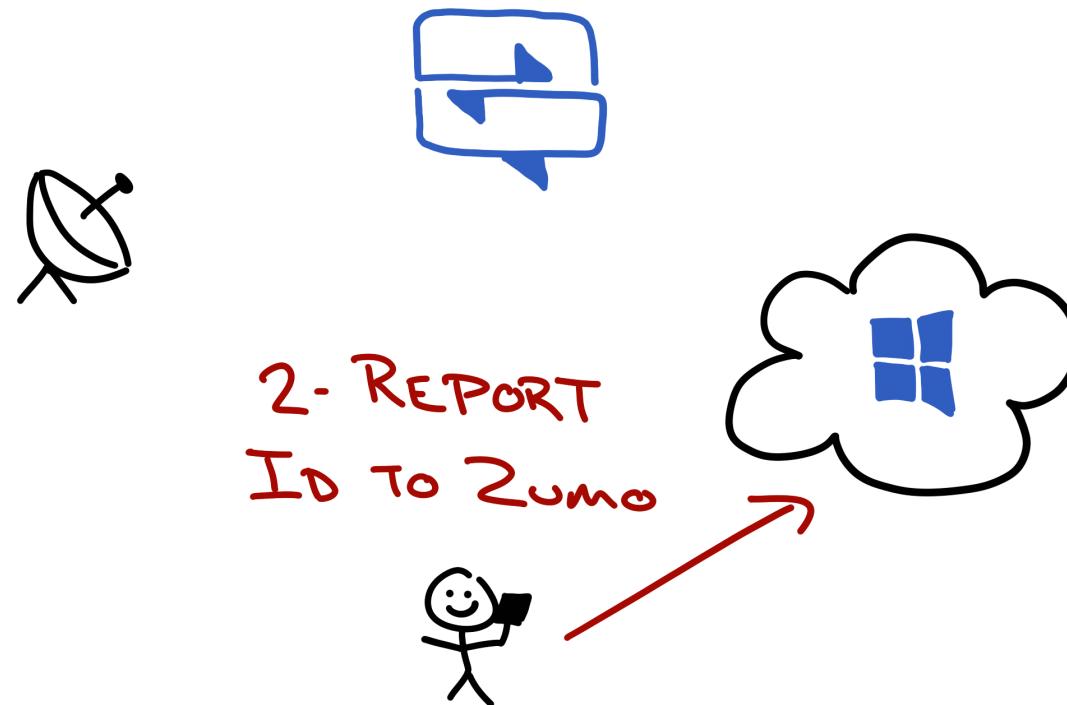
Push Notification Device Registration



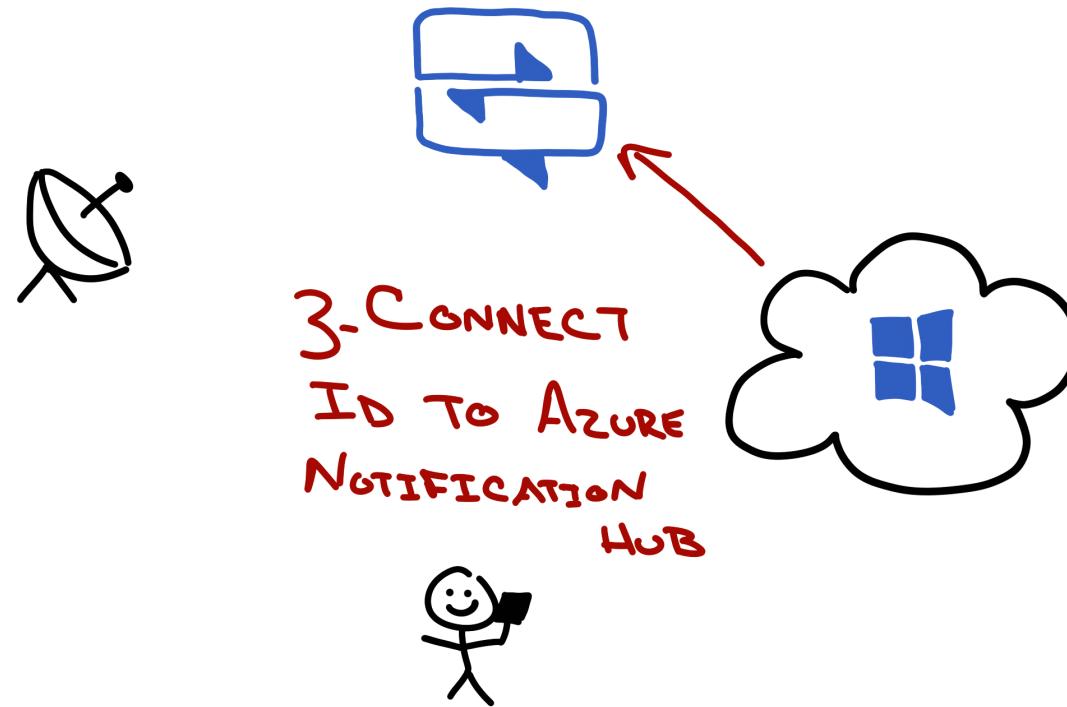
Push Notification Device Registration



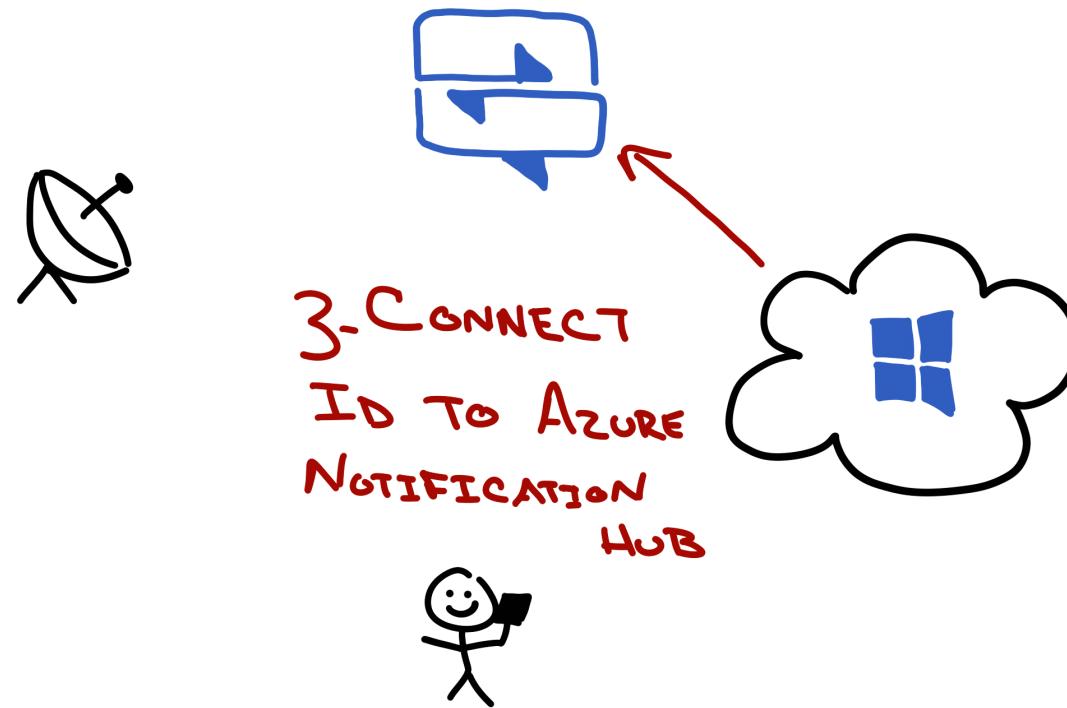
Push Notification Device Registration



Push Notification Device Registration



Push Notification Device Registration



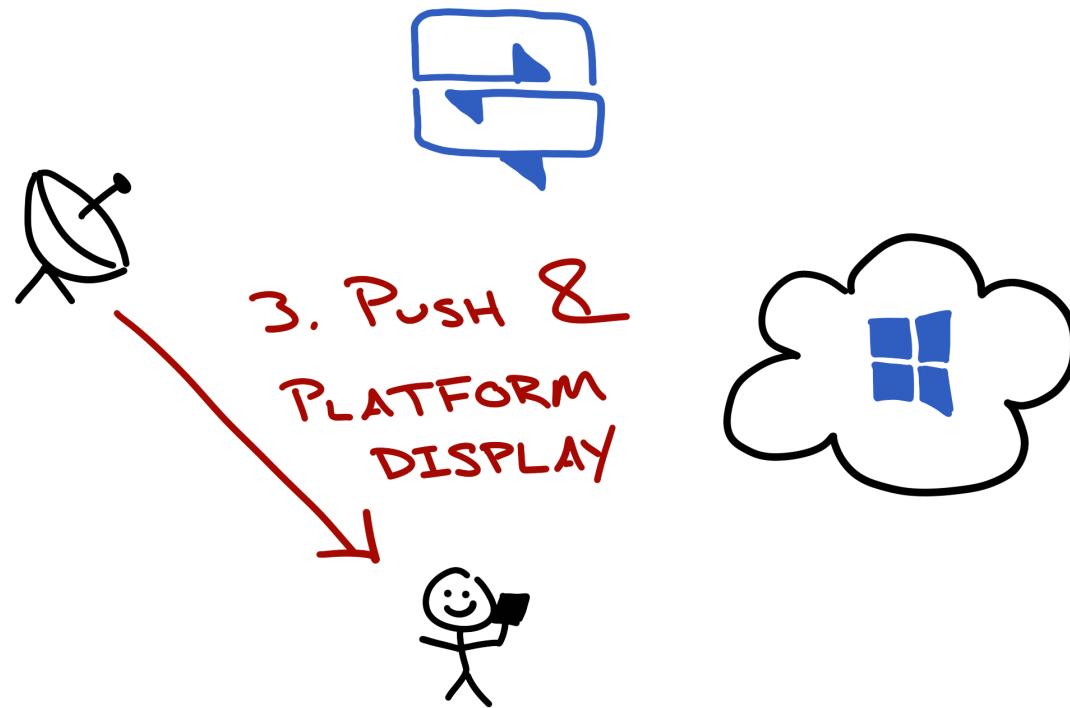
Push Notification Delivery



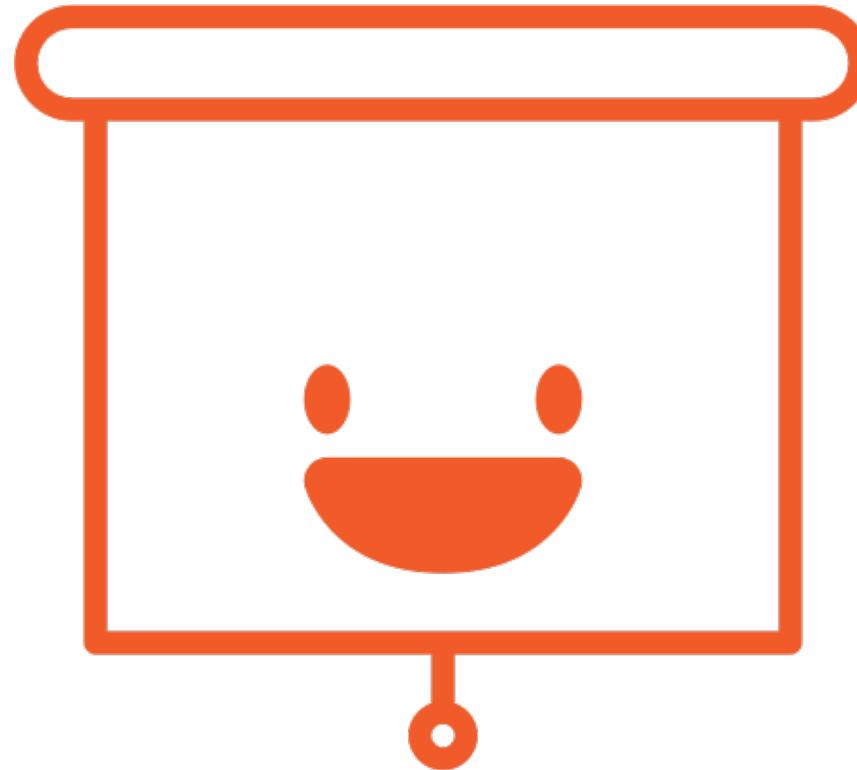
Push Notification Delivery



Push Notification Delivery



Push Notifications



Azure Mobile App Services

**Cloud data with
offline sync**

Authentication

Push notifications

Utilizing Azure Mobile App Services



Matthew Soucoup

PRINCIPAL

@codemillmatt codemilltech.com