Microsoft Azure

Cloud Powered Mobile Apps with Azure

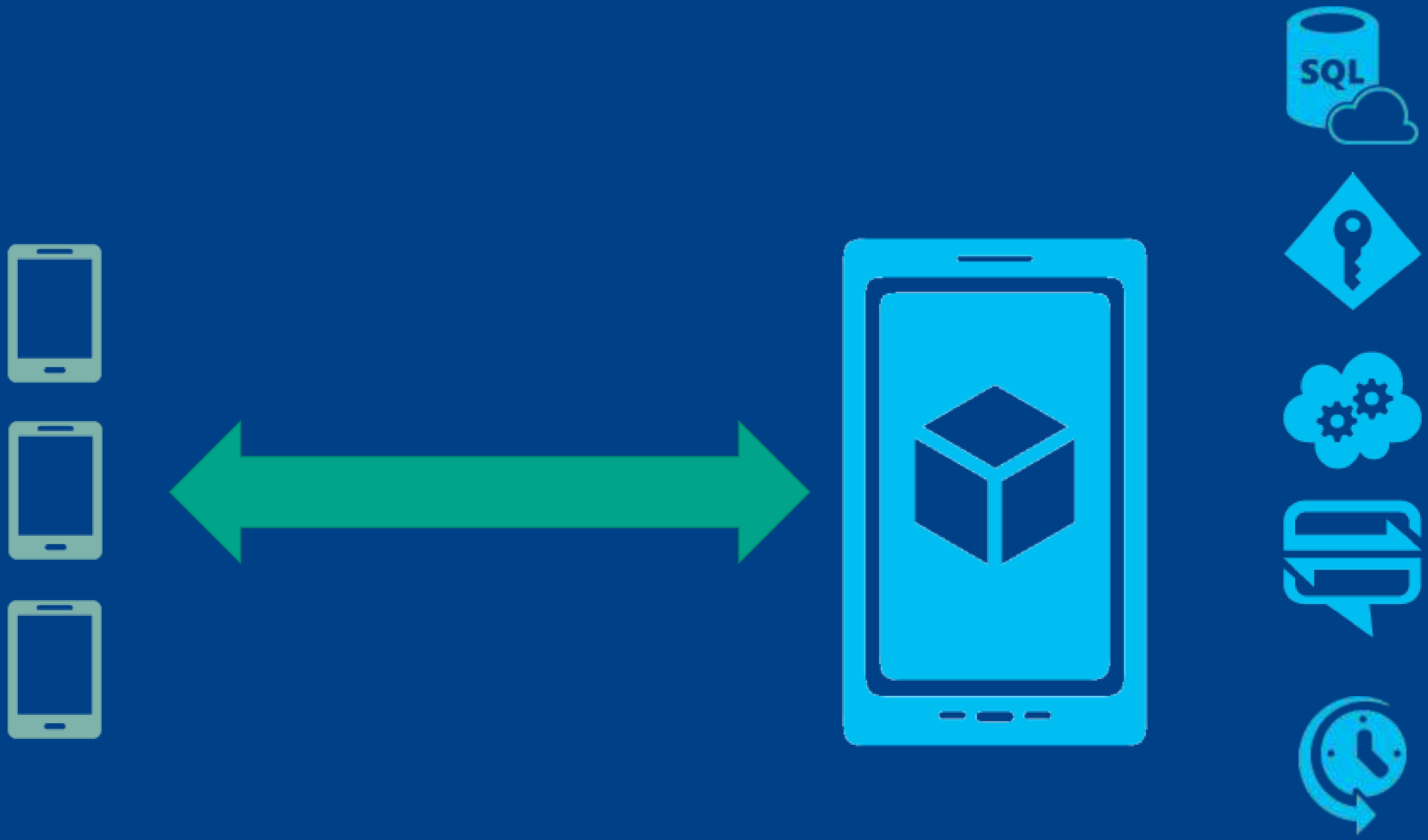
Teerachai Laothong & Sakul Jaruthanaset

Microsoft

Agenda

- Mobile Services
- Features and Demos
- Advanced Features
- Scaling and Pricing
- Questions

What is Mobile Services?



Storage

Authentication

Logic

Push

Scheduler

Demo: Your First Mobile Service

Structured Storage

- Powered by SQL Database
- Supports rich querying capabilities
- Dynamic Schematization
- Data management in:
  - Azure Portal
  - SQL Portal (Silverlight)
  - SQL Management Studio
  - REST API
  - Azure CLI Tools
  - SQL CLI

The REST API

Base Endpoint: https://MobileService.azure-mobile.net/tables/*

Action	HTTP Method	URL Suffix
Create	POST	/TodoItem
Read	GET	/TodoItem?filter=id%3D42
Update	PATCH	/TodoItem/id
Delete	DELETE	/TodoItem/id

JSON to SQL Type Mappings

JSON Type	T-SQL Type
Numeric values (integer, decimal, floating point)	Float(53)
Boolean	bit
DateTime	DateTimeOffset(3)
String	Nvarchar(max)

Auto-generated Columns

Id	unique guid
__createdAt	date
__updatedAt	date
__version	timestamp

Backend Logic:

JavaScript & .NET

Server Side Table Scripts

Node.js scripts	.NET Web API backend in Visual Studio
Passes through to SQL by default	MongoDB, Table Storage, SQL out of the box
Intercept CRUD requests to tables	Fully customizable

request

push.*

sendgrid

console

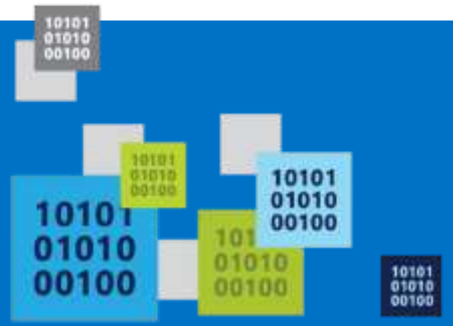
mssql

pusher

tables

azure

twilio



Node Modules

Demo: Adding Data Validation

Microsoft

.NET Backend

- Web API based w/ additional functionality, developed in and deployed from Visual Studio
- TableController data context can map to SQL, Table Storage, Mongo, etc
- Pull in NuGet modules and other .NET libraries
- Set permissions with attributes on classes
- Local Debug

Custom API

- Non-table based endpoints
- Accessible from
  - GET
  - POST
  - PUT
  - PATCH
  - DELETE
- For node.js logic in scripts like table endpoints
- For .NET delivered through a WebAPI
- Expose any functionality you want

File Storage

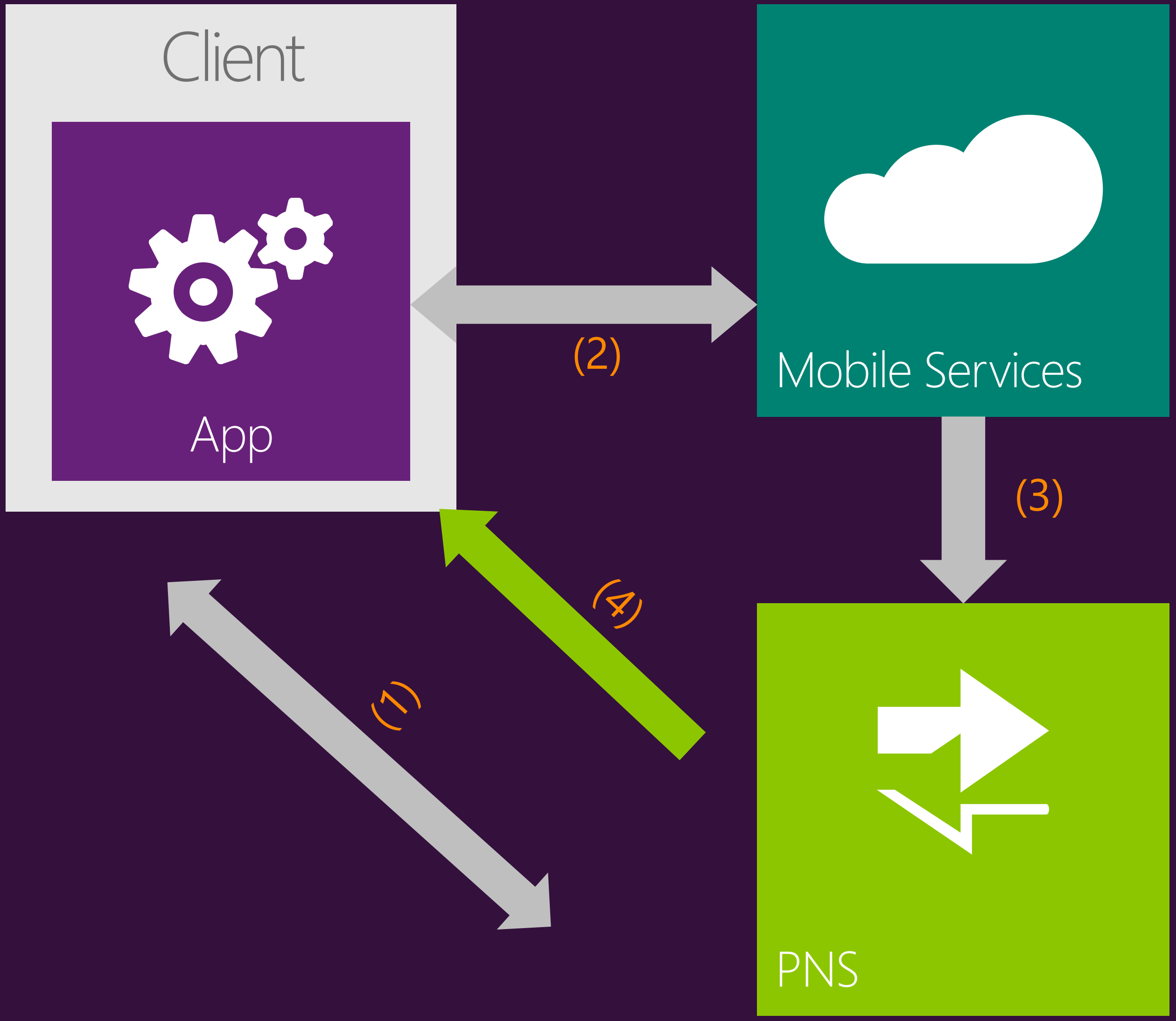
- Don’t store files in Mobile Services DB
- Use Mobile Service to provide a Valet Key Pattern to Blob Storage, aka BLOB SAS
  - Create table / custom API script to talk to Blob Storage
  - Script generates Shared Access Signature (SAS) URL
  - Script returns SAS URL to client app
  - Client app uploads data to blob storage directly
  - Store file URL in Mobile Service DB as needed
- Blob storage costs less and is built for redundant file storage
- Resource Broker extension for .NET and Node backends

Microsoft Azure

Push Notifications

Microsoft

Push Notification Flow



1. Register for push notifications with PNS
2. Send your identifier to Mobile Service
3. Send push from server scripts
4. PNS delivers notification to device

Demo: Adding Push Notifications

Notification Hubs

Service Bus

- Separate from Mobile Services
  - Can be used regardless of whether you’re storing data in Azure
- Extremely scalable push notifications
- Cross platform support
  - Push to iOS, Android, Kindle, Windows Phone, Windows Store
- Tags (i.e. tie my registration to this topic or user ID)
- Templates (i.e. when I get a push, send it in this format)
- Server SDKs for .NET, Java, and Node (also open as REST API)

Authorization & Authentication

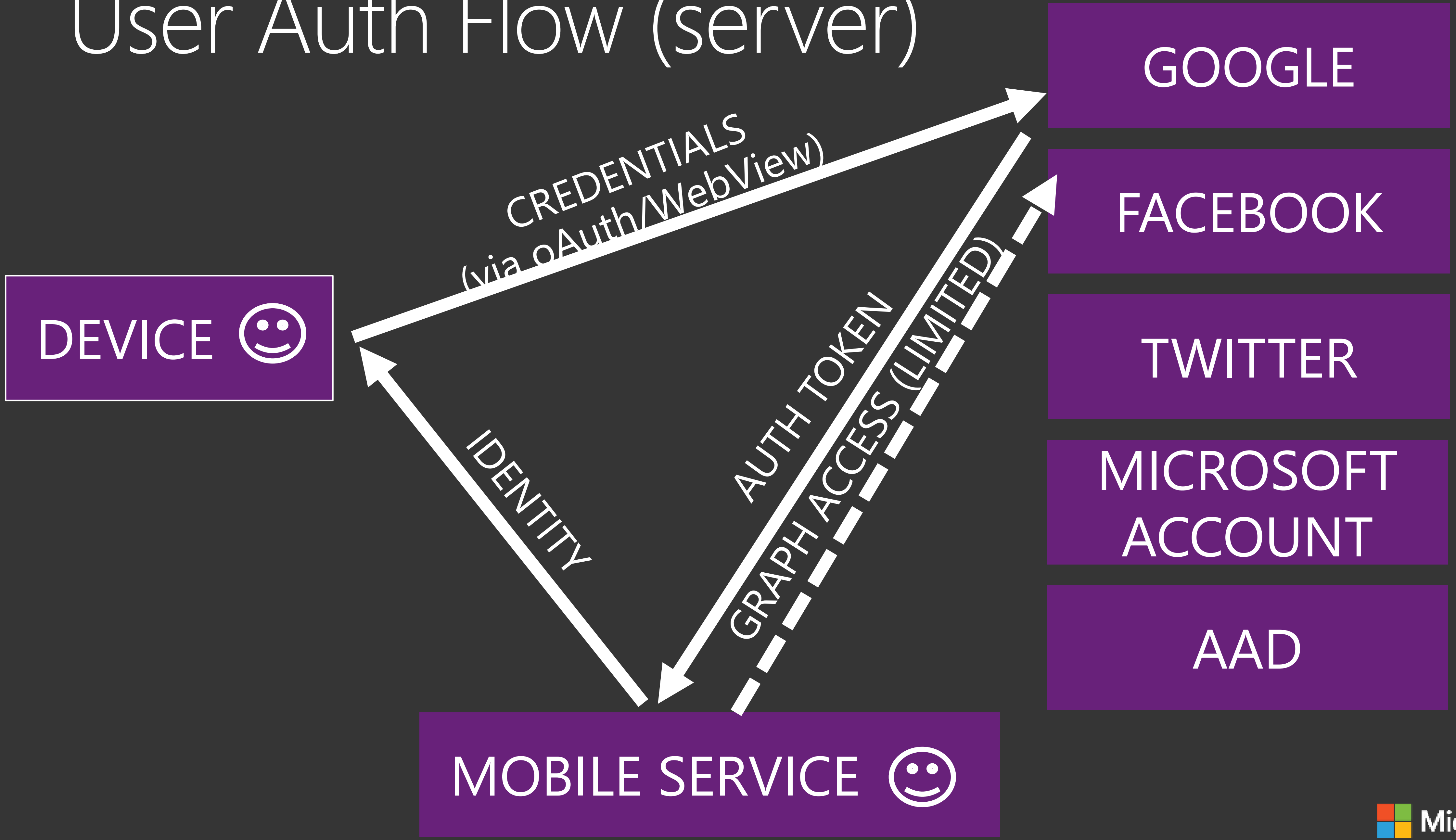
Data Authorization

Per HTTP method auth options:

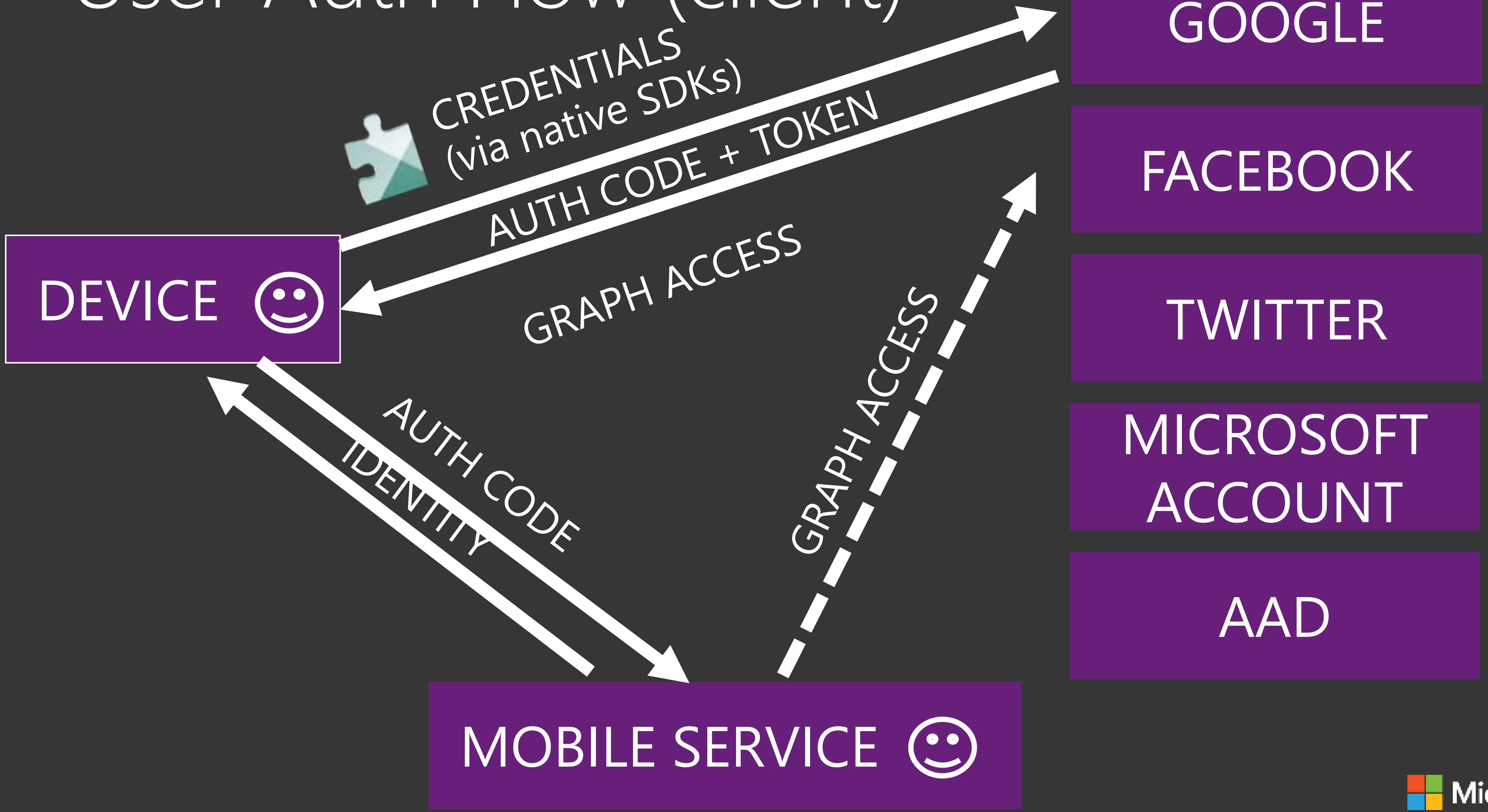
- App Key Required
  - Not ideal for production use
- Everyone
- Authenticated Users
- Admins and other scripts
  - Requires Master Key as header

401 Unauthorized response if security check fails

User Auth Flow (server)



User Auth Flow (client)



DEVICE ☺

MOBILE SERVICE ☺

GOOGLE

FACEBOOK

TWITTER

MICROSOFT ACCOUNT

AAD

The User object

User.level

- Admin
- Authenticated
- Anonymous

User.userId

- Provider:id or undefined

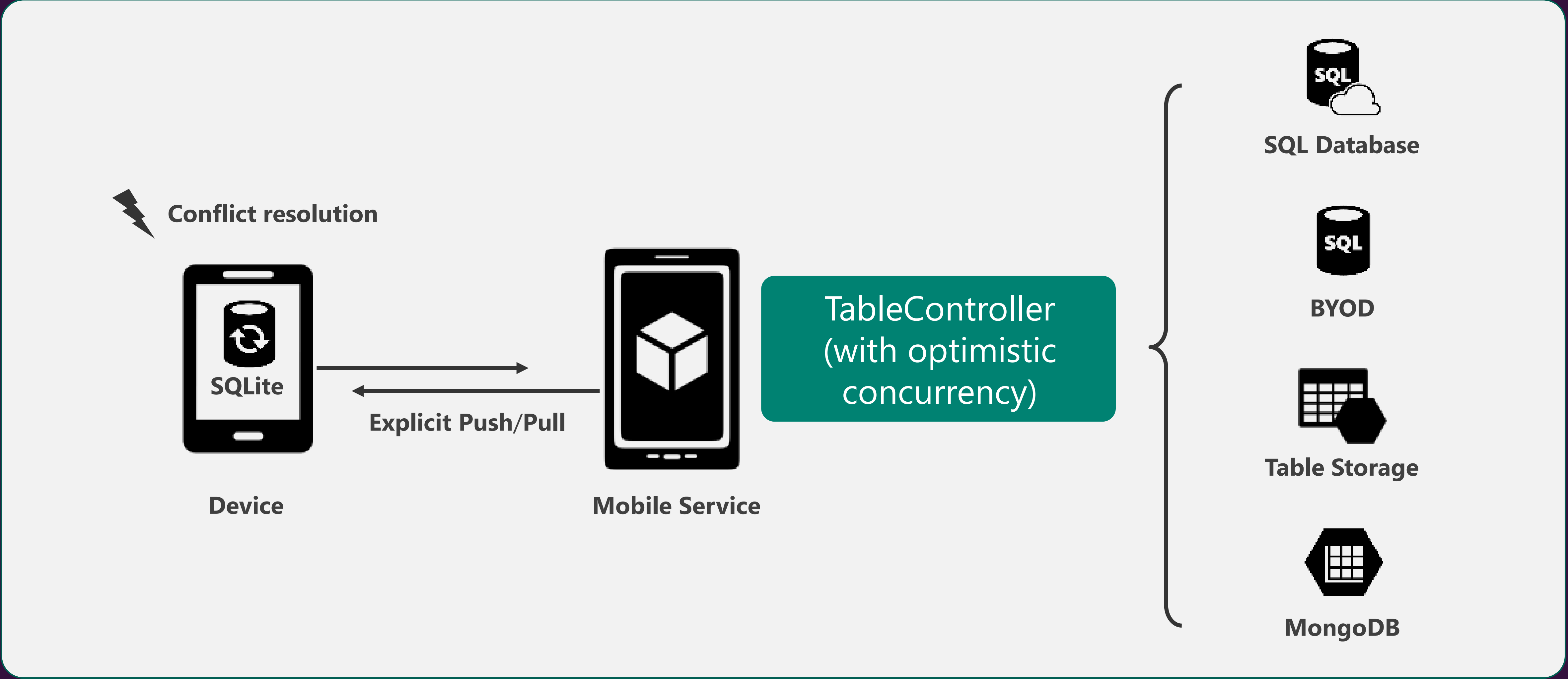
User.getIdentities()

- UserId
- Provider Access Token / Secret
- Basic user information (i.e. name, username, locale, picture, link)

Demo: Adding Auth

Offline Sync

Offline support



Offline Sync: Potential Uses

- Improve app responsiveness by caching server data locally on the device
- Make apps resilient against intermittent network connectivity
- Allow end-users to create and modify data even when there is no network access, supporting scenarios with little or no connectivity
- Sync data across multiple devices and detect conflicts when the same record is modified by two devices

Scheduler

Scheduled Jobs

Executes a script on defined schedule

Can be run on demand

Ideal for any backend data processing job

Length / frequency based of Mobile Service tier

Script Source Control

Script Source Control

- Creates a Git repo in Azure
- Node.js only, turned on by default
- Access table, scheduler, custom API, shared scripts and permissions
- Pushing changes triggers a redeploy of your Mobile Service
- Enables installing NPM modules (for Node backends)

Diagnostics, Logging & Scale

Diagnostics, Logging & Scale

API Calls, # of Devices, Data Out

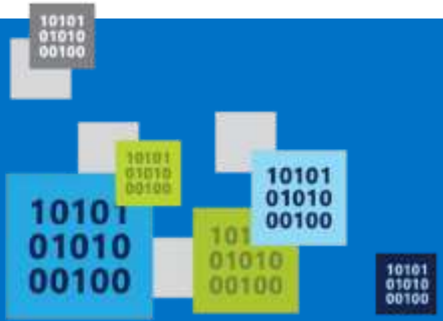
Console Logging (auto error logging)

Scale Service Based off API Calls

Auto-scale to Save Money

Free Tier for Mobile

Free Tier for SQL



Mobile Service Scaling

- → Free: 500k calls / month / subscription
- → Basic: 1.5M calls / unit (6) / month
- → Standard: 15M calls / unit (10) / month

Demo: Leaving Free Mode and Turning on AutoScale

Command Line Interface

CLI

- Create / Delete Services
- Inspect / Delete Table Data
- Create / Update / Delete Tables and Permissions
- Create / Upload / Delete Scripts
- Scale Up / Down Services
- Much More Across Azure

Demo: Using the CLI

Mobile Service Tiers

usage & licensing $

	Free	Basic	Standard
Usage Restrictions	Up to 10 services, Up to 500 Active Devices*	N/A	N/A
API Calls	500K (per subscription)	1.5M (per unit)	15M (per unit)
Scale	N/A	Up to 6 (in portal)	Up to 10 (in portal)
Scheduled Jobs	Limited	Included	Included
SQL Database (required)	20MB free DB	20MB free DB	20MB free DB

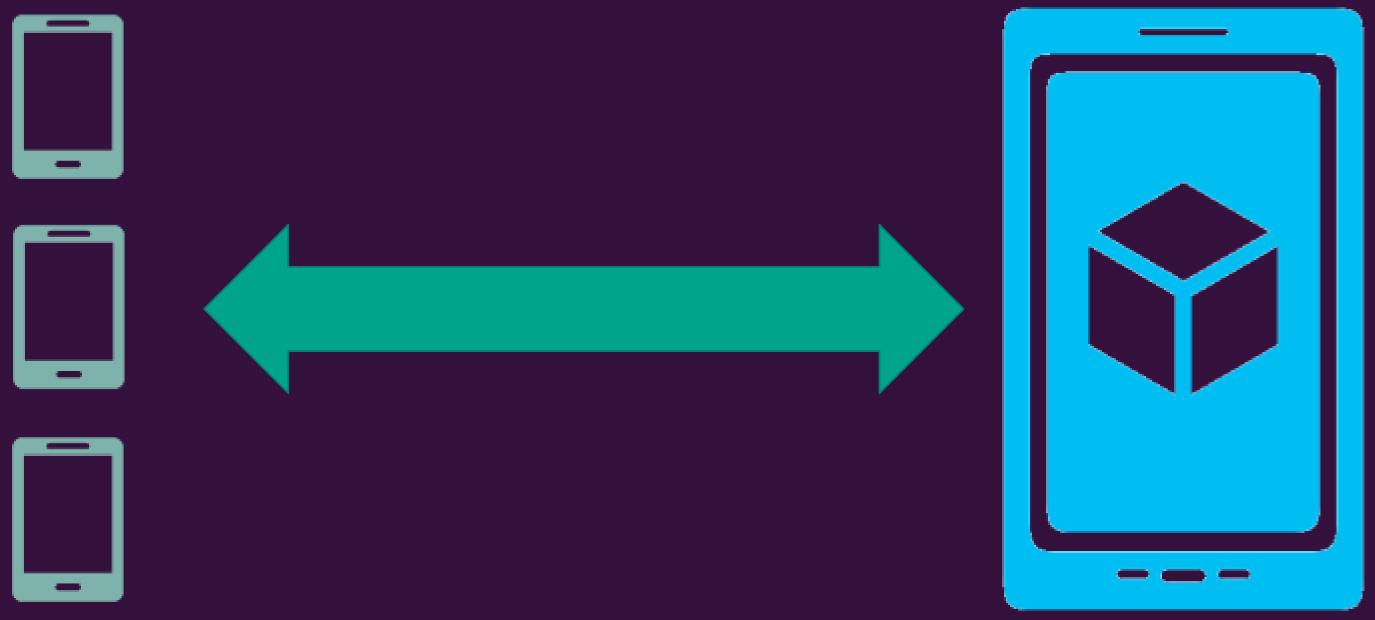
service level agreements

General Availability

99.9%

*Active devices refers to the number of physical devices and emulators that make at least one call to or receive a push notification from your mobile service.

Azure Mobile Services



- Storage
- Authentication
- Logic
- Push
- Scheduler

Try Mobile Services today

Get a FREE Microsoft Azure Trial Account:

http://azure.microsoft.com

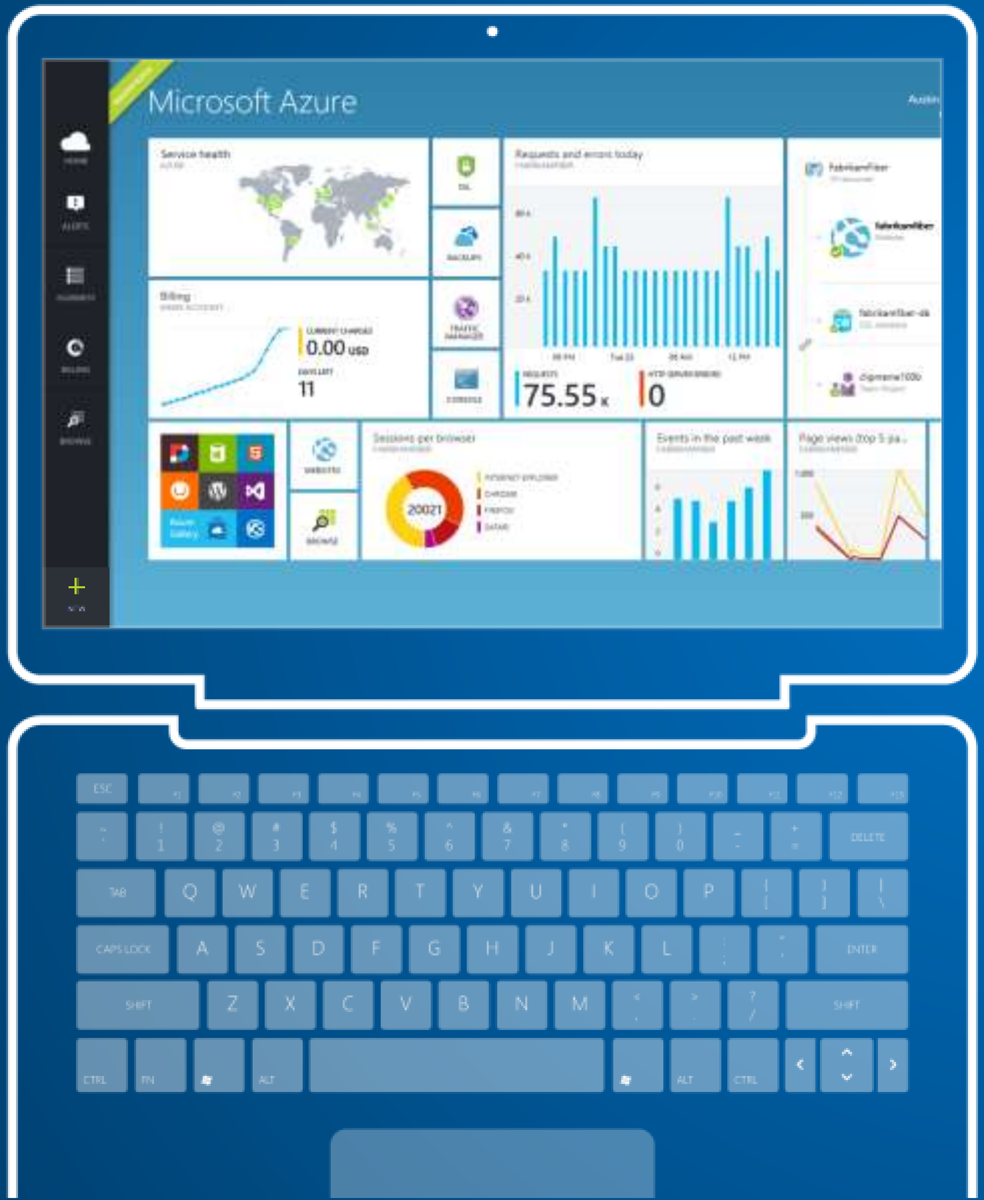
Videos, Tutorials, and More

http://azure.microsoft.com/mobile

SDK Source Code on GitHub

https://github.com/Azure/azure-mobile-services

Questions?:



Get started

Visit azure.microsoft.com

Microsoft