

Visual Studio **LIVE!** | San Diego
EXPERT SOLUTIONS FOR .NET DEVELOPERS

Lessons Learned from Making Mobile Apps Resilient

Matthew Soucoup
Sr Cloud Developer Advocate
Microsoft

Level: Intermediate

Code Again for the First Time!

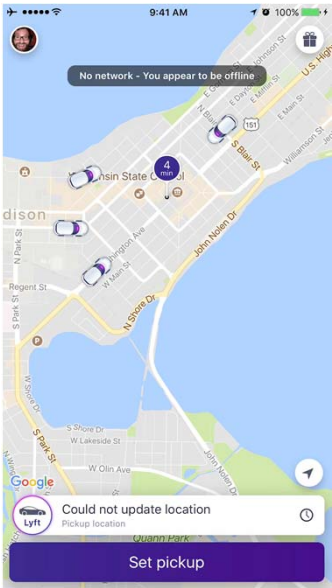
Visual Studio 25 YEARS OF CODED INNOVATION

Not so great offline...



@codemillmatt

Not so great offline...



@codemillmatt

Disconnected - Usable

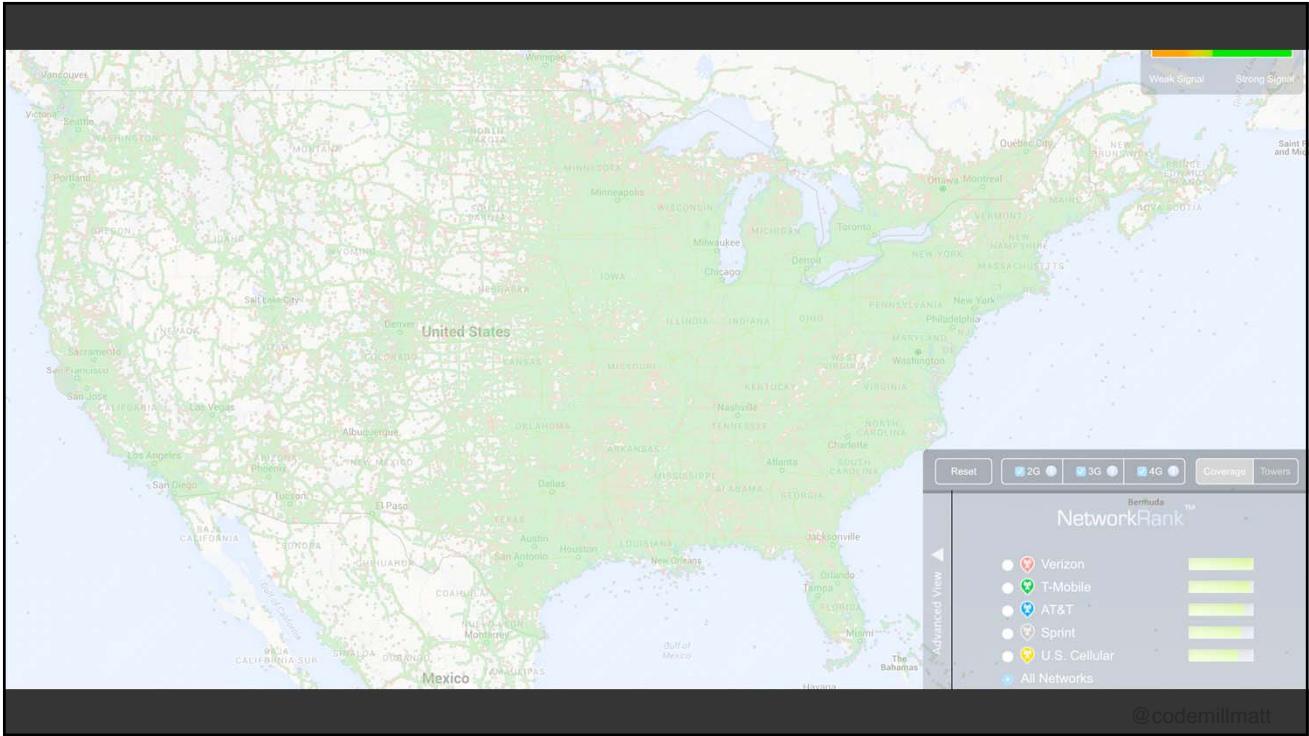


@codemillmatt

Disconnected -> Reconnected

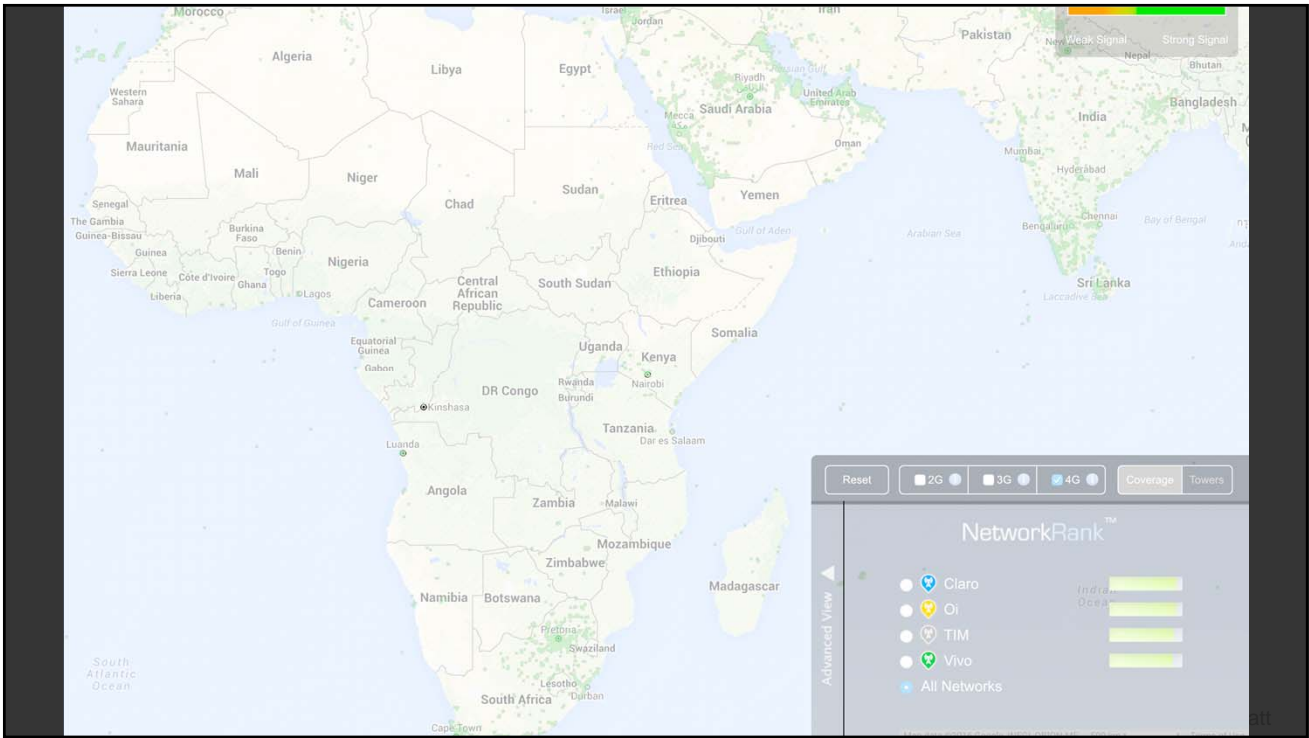
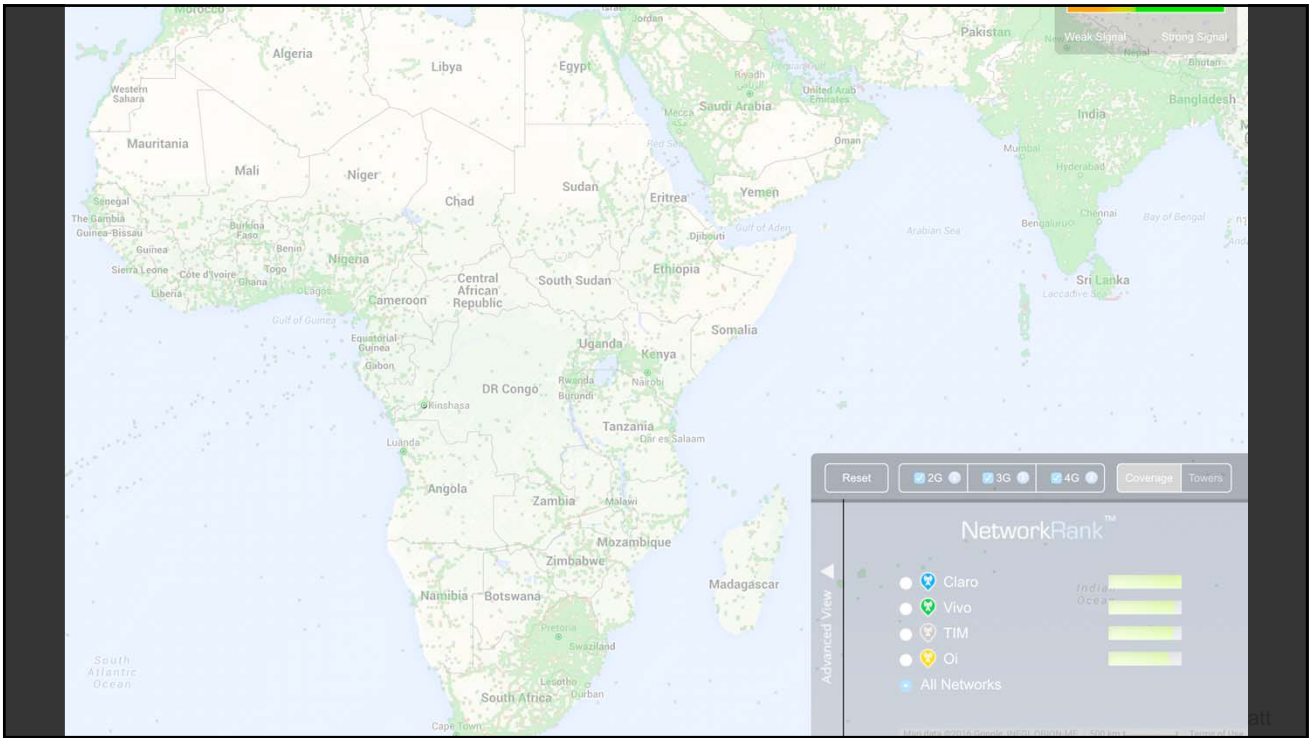


@codemillmatt



@codemillmatt

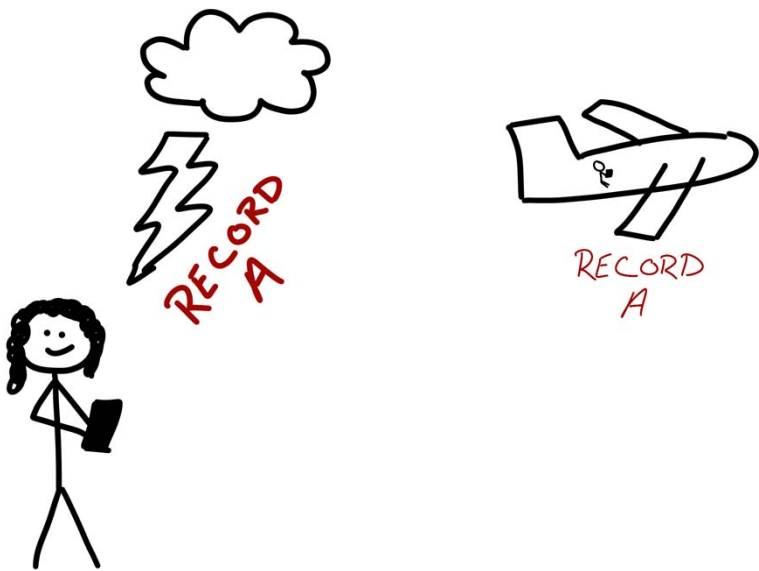
Visual Studio Live! San Diego 2018



T10 - Lessons Learned from Making Resilient Apps with Azure Mobile App Services - Matthew Soucoup

© Microsoft Corporation. All rights reserved. MICROSOFT MAKES NO WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, AS TO THE INFORMATION IN THIS PRESENTATION.

Conflicts...



@codemillmatt

Conflicts...



@codemillmatt

Silent push...

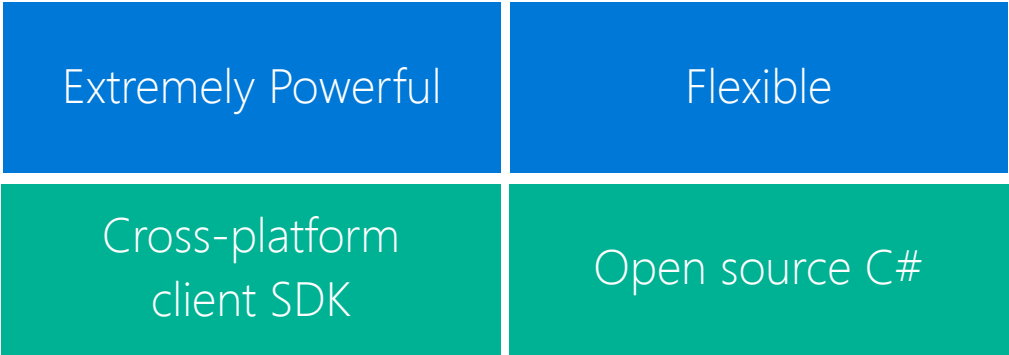


@codemillmatt

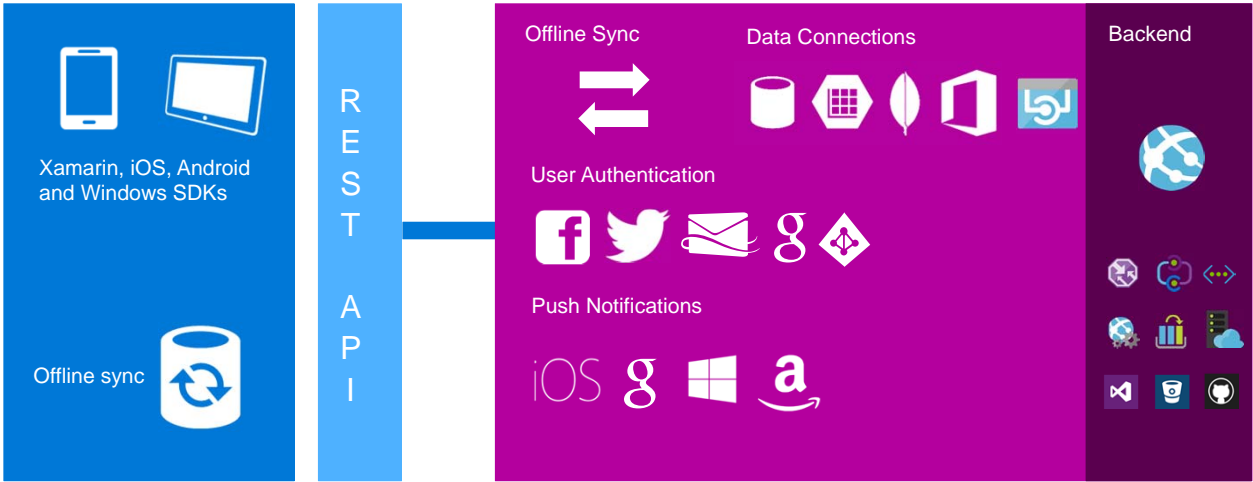
Azure Mobile App Services

@codemillmatt

Why Use Azure Mobile App Services?



@codemillmatt



@codemillmatt

Agenda

Client-side schemas

Offline data

Conflict resolution

Silent data push

@codemillmatt

Client-side schemas

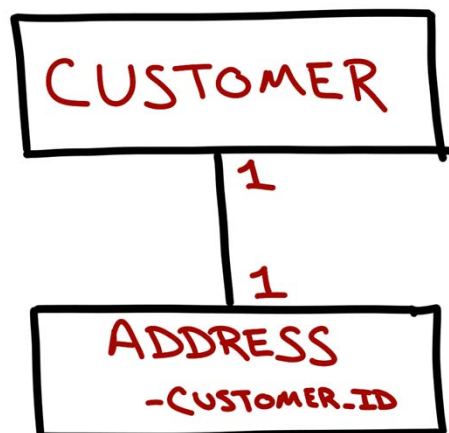


"Keep your client-side schema flat."

-Matt ... just now

@codemillmatt

Flat schemas – 1:1



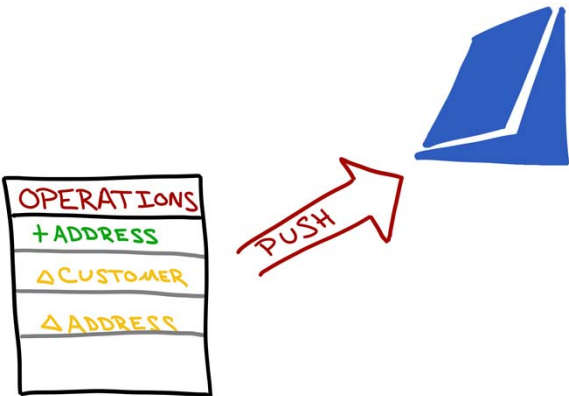
@codemillmatt

Operations table – Offline sync

OPERATIONS
+CUSTOMER
+ADDRESS
ΔCUSTOMER
ΔADDRESS

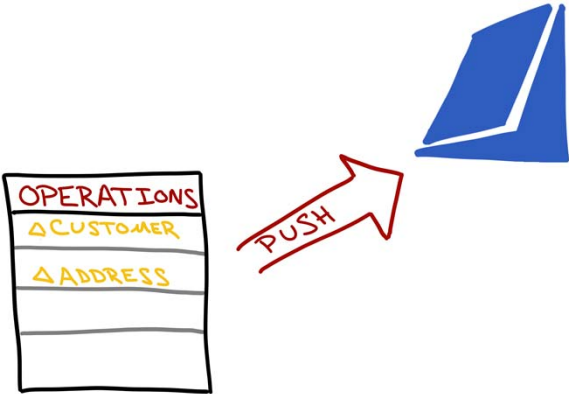
@codemillmatt

Operations table – Offline sync



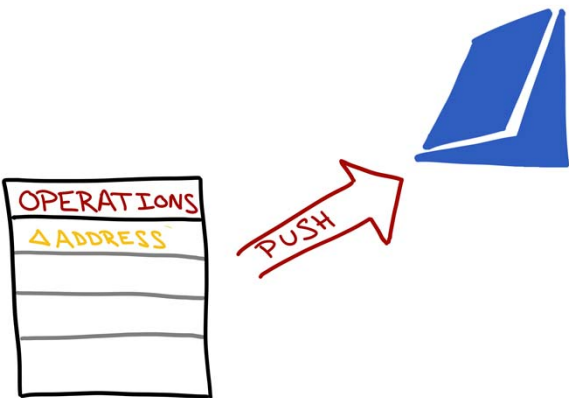
@codemillmatt

Operations table – Offline sync



@codemillmatt

Operations table – Offline Sync



@codemillmatt

Operations table – Offline Sync



@codemillmatt

Offline sync with 1:1

Data relationships
managed on client

Replay to server
"just works"

@codemillmatt

Troubles with 1:Many - Server

Server-side
ICollection<T>

Obey OData

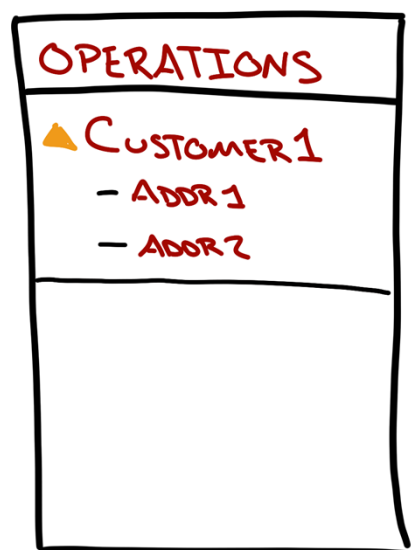
\$expand must
be used

TableController<T>
doesn't \$expand

Read-only
results

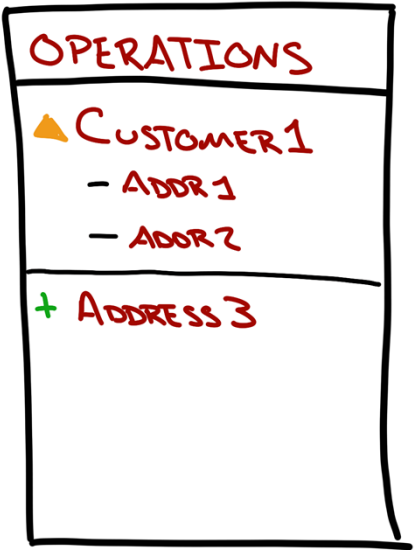
@codemillmatt

Troubles with 1:many - Client



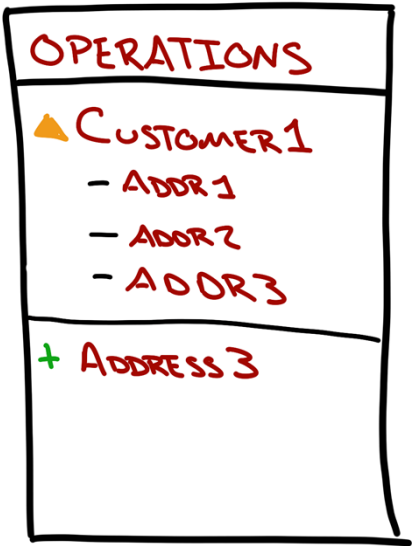
@codemillmatt

Troubles with 1:many - Client



@codemillmatt

Troubles with 1:many - Client



@codemillmatt

1:many – How to work around

New tables on
server to model
1:1
relationships

Use the Mapped
Entity Domain
Manager

Customized
Web APIs

@codemillmatt

Lessons learned

Flat data (1:1)

Mobile specific APIs

Optimize for bandwidth

Optimize for MVVM

@codemillmatt

Offline data

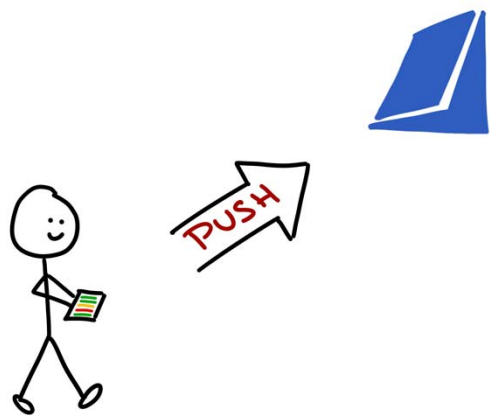


Offline data flow



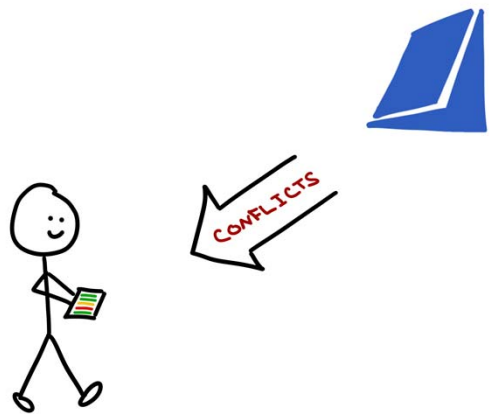
@codemillmatt

Offline data flow



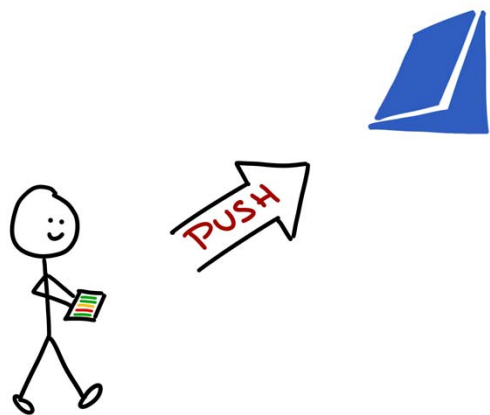
@codemillmatt

Offline data flow



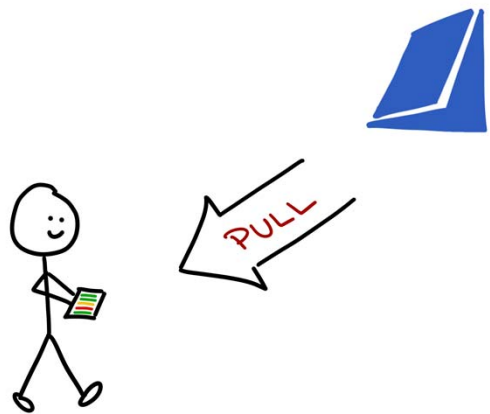
@codemillmatt

Offline data flow



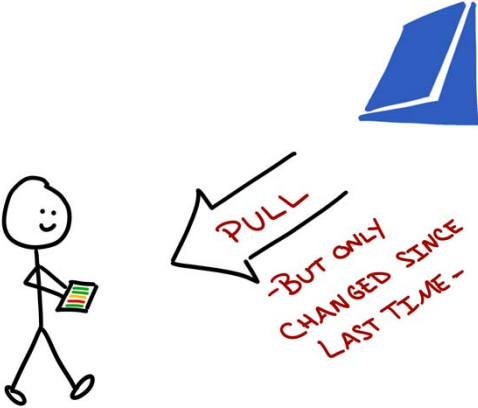
@codemillmatt

Offline data flow



@codemillmatt

Offline data flow



@codemillmatt

Demo



Lessons learned

No need to push
data immediately

Only do large
pushes on WiFi

Only store data
offline when it
makes sense

Incremental sync
is your friend

SyncContext has
pending ops

@codemillmatt

Conflict resolution



Conflicts...



@codemillmatt

Conflicts...



@codemillmatt

How can Zumo tell?

Id

CreatedAt

UpdatedAt

Deleted

Version

@codemillmatt

Version column

Byte array

Maintained on
the server

On push, Zumo
takes care of
updating value

@codemillmatt

3 possible conflict outcomes

Server wins

Client wins

Hybrid – combo
of both win

@codemillmatt

Demo



Lessons learned

Push shared data ASAP

Never mess with the
version column (normally)

Different exceptions for
offline vs online push

Don't ask the user if
their data should win

@codemillmatt

Silent push

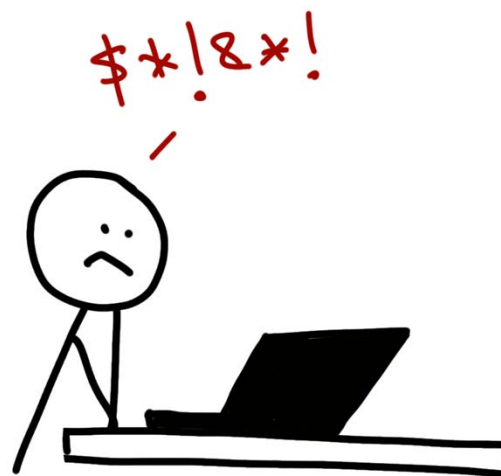


Silent data push



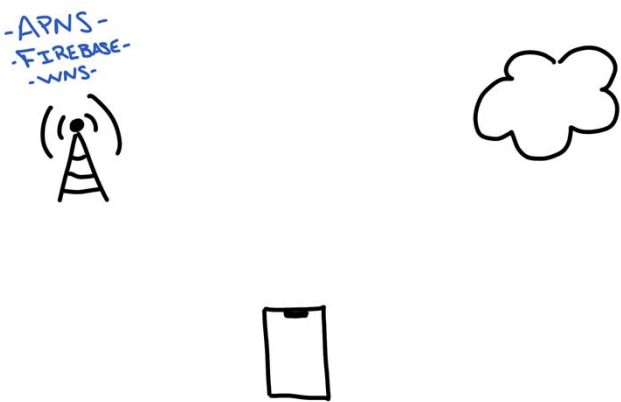
@codemillmatt

Developing Push Enabled Apps



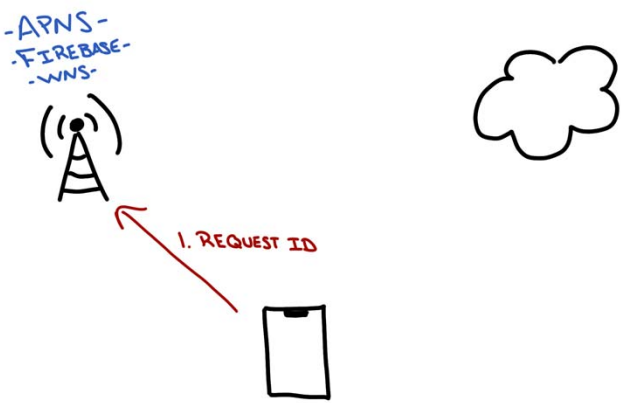
@codemillmatt

Developing Push Enabled Apps



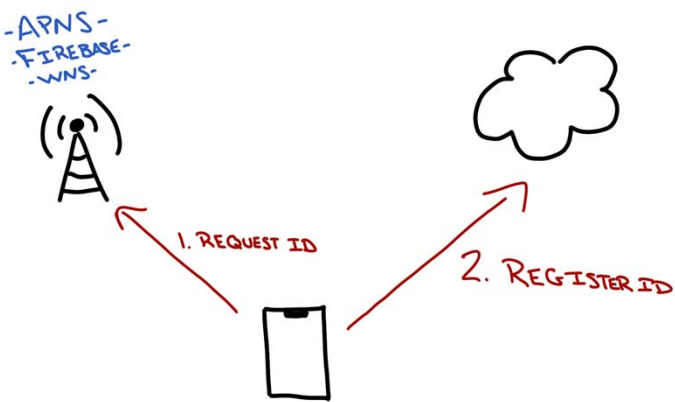
@codemillmatt

Developing Push Enabled Apps



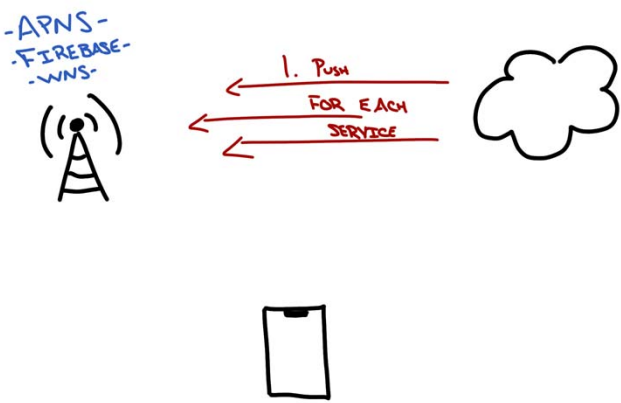
@codemillmatt

Developing Push Enabled Apps



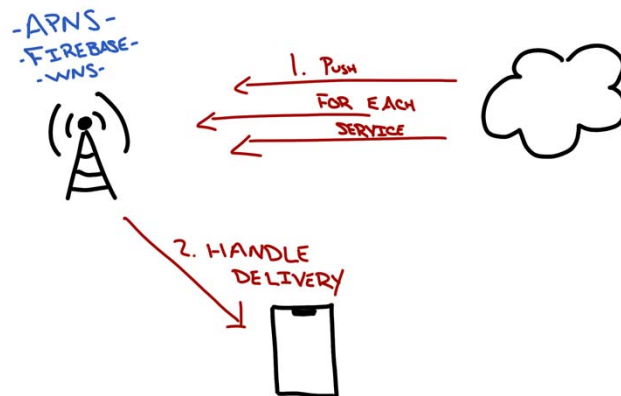
@codemillmatt

Developing Push Enabled Apps



@codemillmatt

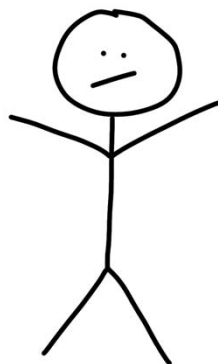
Developing Push Enabled Apps



@codemillmatt

Developing Push Enabled Apps

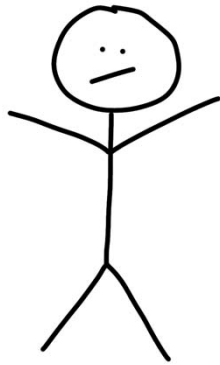
SERIOUSLY ?!/?



@codemillmatt

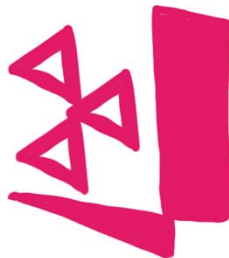
Developing Push Enabled Apps

SERIOUSLY ?!?



@codemillmatt

Visual Studio App Center



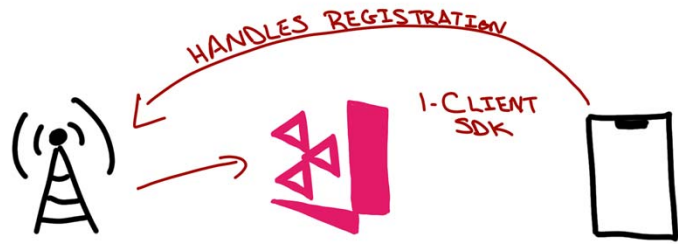
@codemillmatt

Push with VS App Center



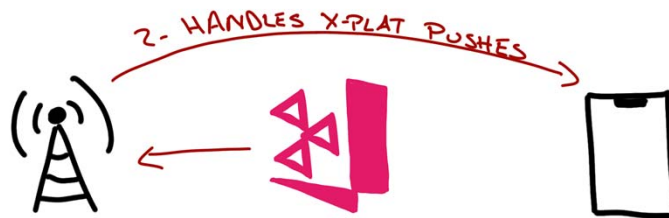
@codemillmatt

Push with VS App Center



@codemillmatt

Push with VS App Center



@codemillmatt

Silent data push - benefits

Keeps data up to date
no interactions

Can be targeted

@codemillmatt

Demo



Lessons learned

Spend time with
APNS and Firebase

Need to account
for message not
arriving

App Center
Notification Hub
templates

@codemillmatt

Summary

Client-side schemas

Offline data

Conflict resolution

Silent data push

@codemillmatt



Thank you!

<https://msou.co/9m>

Matthew Soucoup
Sr Cloud Developer Advocate
@codemillmatt

