



Visual Studio **LIVE!**
EXPERT SOLUTIONS FOR .NET DEVELOPERS

SQL Server **LIVE!**
TRAINING FOR DBAs AND IT PROS

TECHMENTOR

Artificial
Intelligence **LIVE!**
AI FOR DEVELOPERS AND DATA SCIENTISTS

Office &
SharePoint **LIVE!**
ON-PREMISE, CLOUD & CROSS-PLATFORM TRAINING

Modern Apps **LIVE!**
MOBILE, CROSS-DEVICE & CLOUD DEVELOPMENT

VSS02 – HOL Xamarin Resilient Connected Apps

Marcel de Vries & Roy Cornelissen

The Ultimate Education Destination

2018
Orlando

X Xpirit

Level: Introductory - Intermediate

HAPPY USER



GRUMPY USER

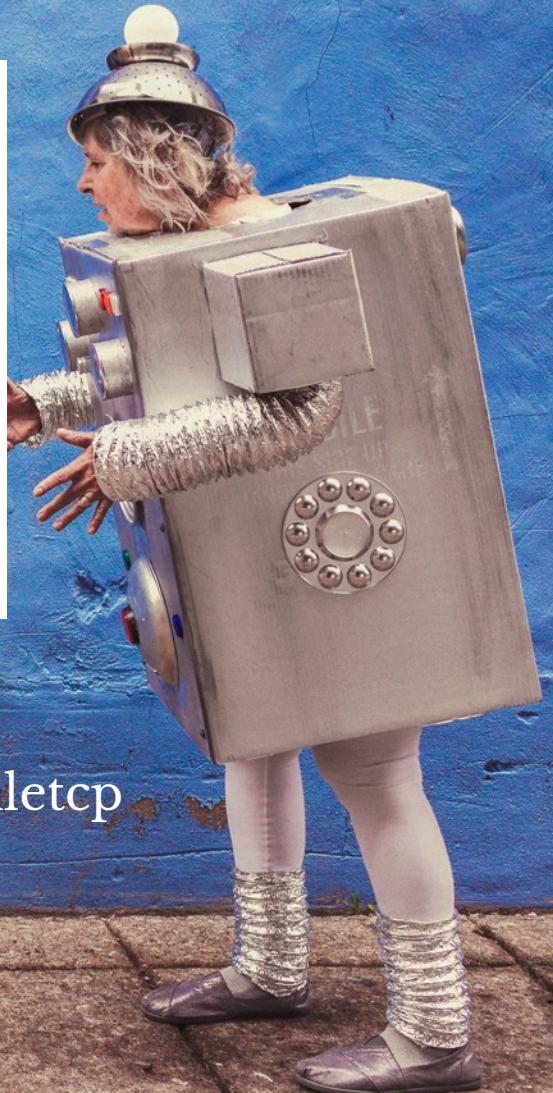
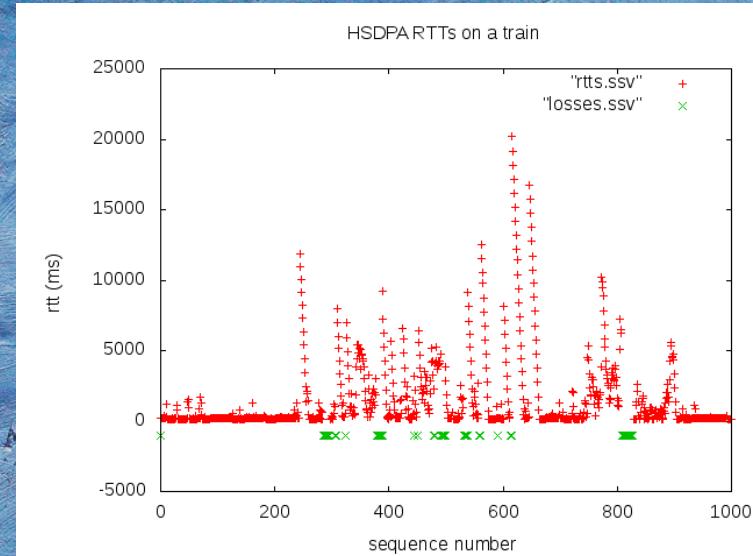


8 FALLACIES OF DISTRIBUTED COMPUTING

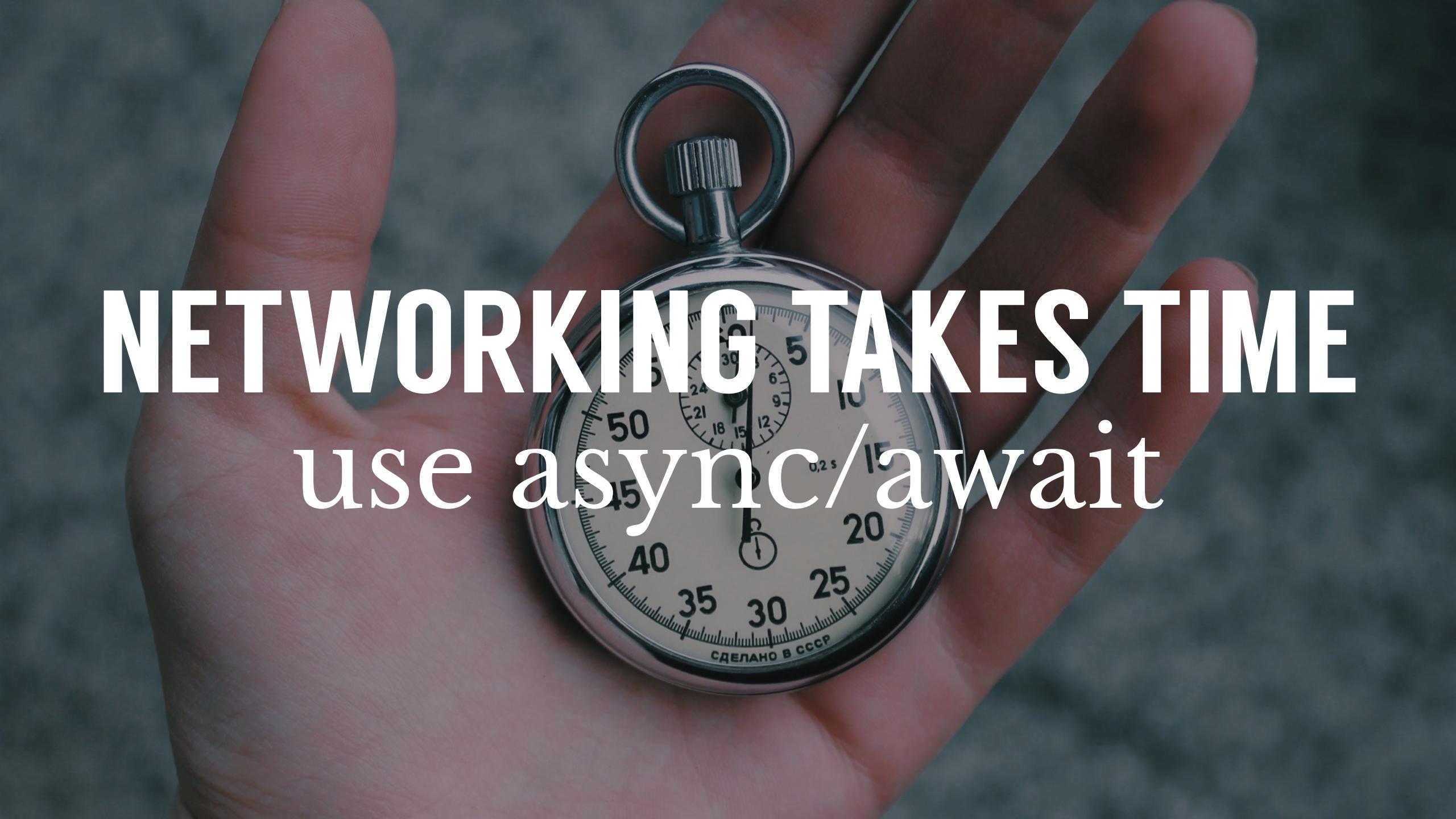
1. THE NETWORK IS RELIABLE.
2. LATENCY IS ZERO.
3. BANDWIDTH IS INFINITE.
4. THE NETWORK IS SECURE.
5. TOPOLOGY DOESN'T CHANGE.
6. THERE IS ONE ADMINISTRATOR.
7. TRANSPORT COST IS ZERO.
8. THE NETWORK IS HOMOGENEOUS.



ESPECIALLY ON MOBILE, THIS IS CHALLENGING



<http://blog.davidsingleton.org/mobiletcp>

A close-up photograph of a person's hand holding a vintage-style stopwatch. The stopwatch has a silver case and a black dial with numbers 20, 25, 30, 35, 40, 45, 50, and 10 visible. There are smaller numerical markings between the main numbers. The brand name "СДЕЛАНО В СССР" (Made in USSR) is printed at the bottom of the dial. The background is dark and slightly blurred.

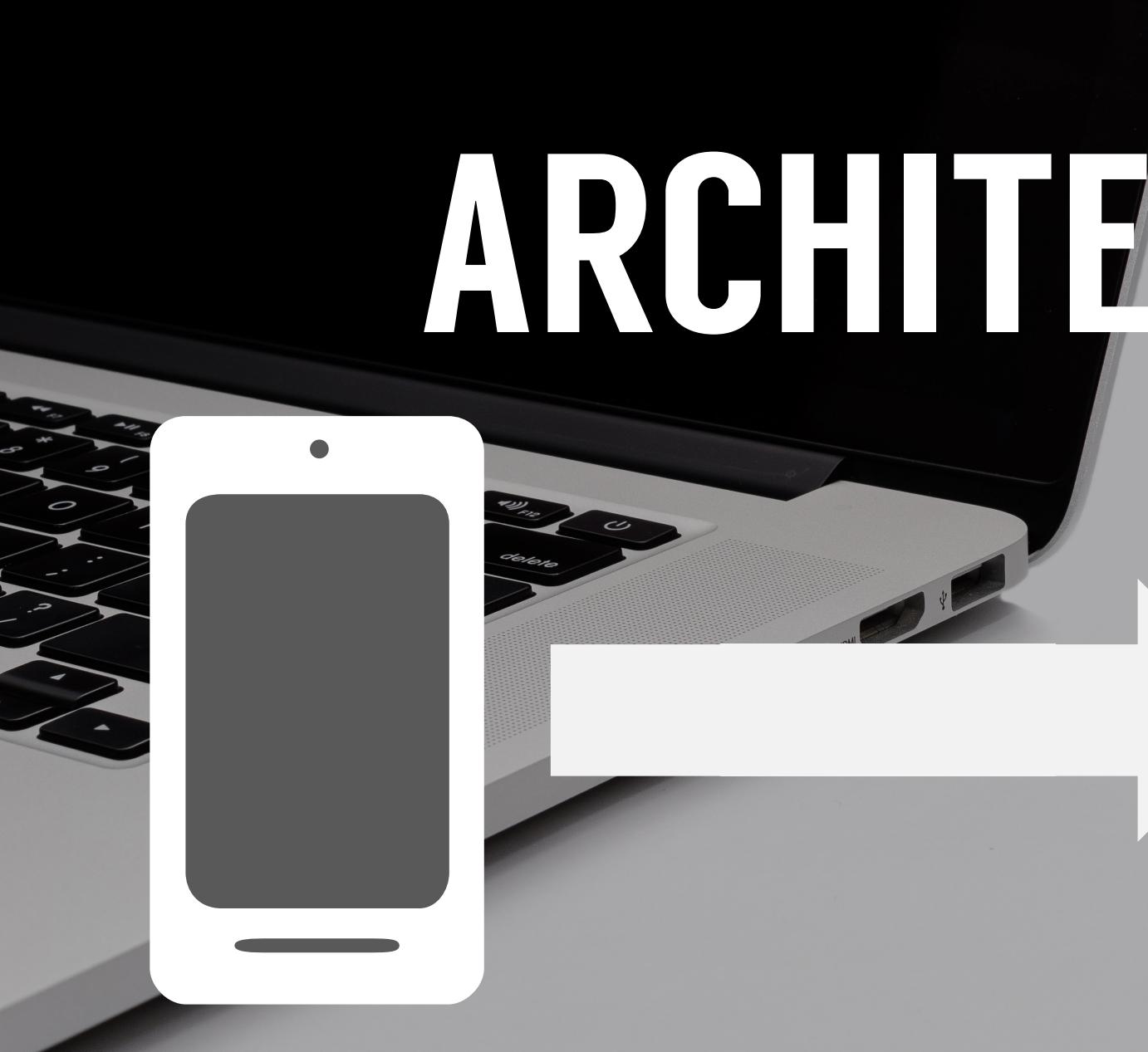
NETWORKING TAKES TIME
use `async/await`

SAMPLE REPO



[roycornelissen/ConquerTheNetwork](https://github.com/roycornelissen/ConquerTheNetwork)

ARCHITECTURE



OUR GOALS

- 1.Do less coding
- 2.Speed!
- 3.Work offline
- 4.Deal with errors

TIP

KNOW YOUR TOOLS

CHARLES / FIDDLER
or any network monitor

NETWORK LINK CONDITIONER

<https://developer.apple.com/download/more/?q=Additional%20Tools>

ANDROID EMULATOR



GOAL #1
be a lazy dev

(do less coding)



be a lazy dev

> Install-Package Refit

(thanks Paul Betts!)

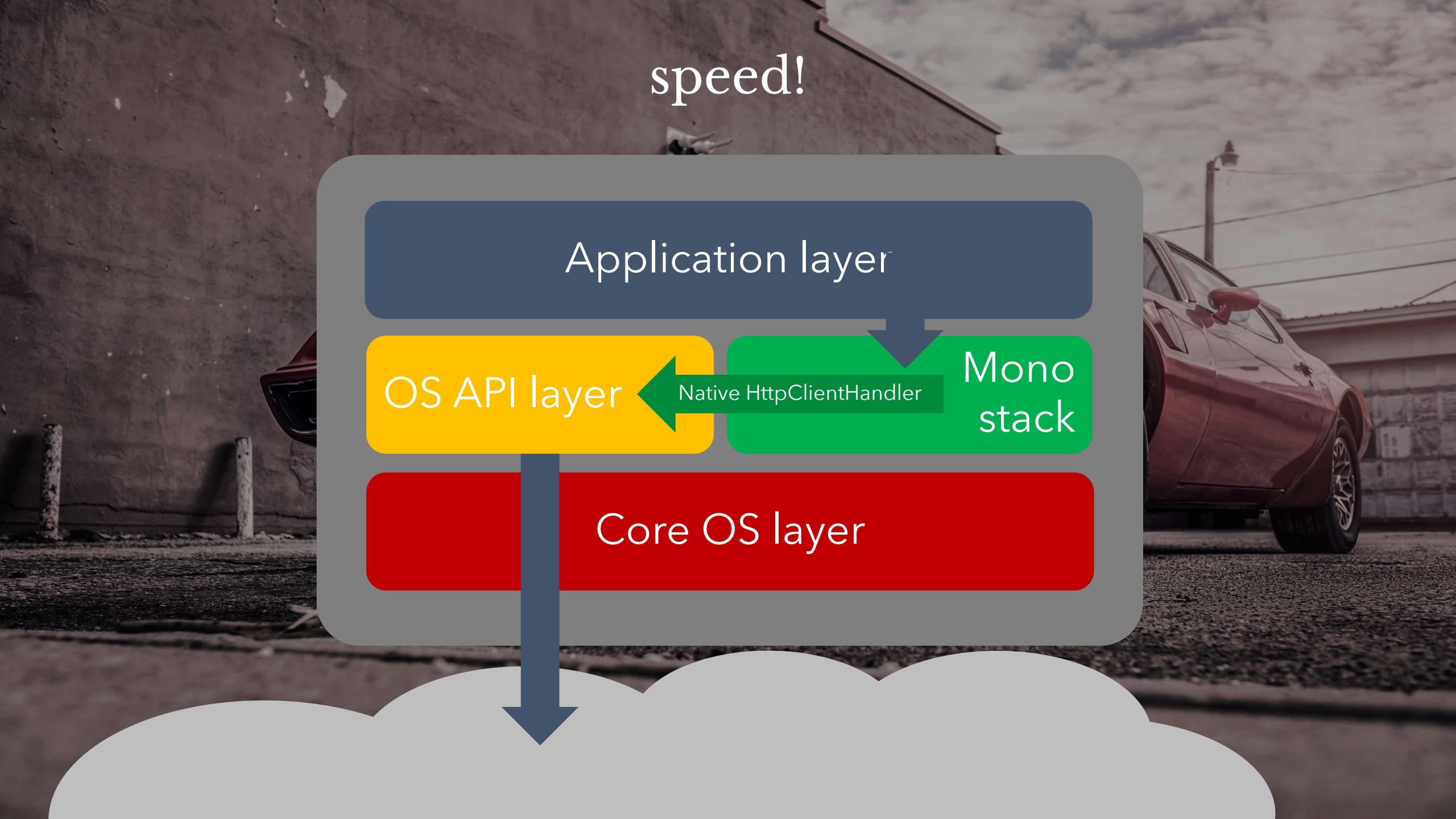
A red sports car, possibly a Ford GT, is parked on a gravel surface in front of a weathered, brown brick building. The car's front grille features a prominent Ford oval logo. The scene is set during the day under a cloudy sky.

GOAL #2
speed!

A red Pontiac Firebird Trans Am is shown from a rear three-quarter perspective, driving away from the viewer on a city street. The car is positioned in front of a weathered, brown brick building with a power outlet visible on its side. The sky is overcast with dramatic clouds. The overall aesthetic is reminiscent of classic 80s action movies.

speed!

STEP 1
use native stack



speed!

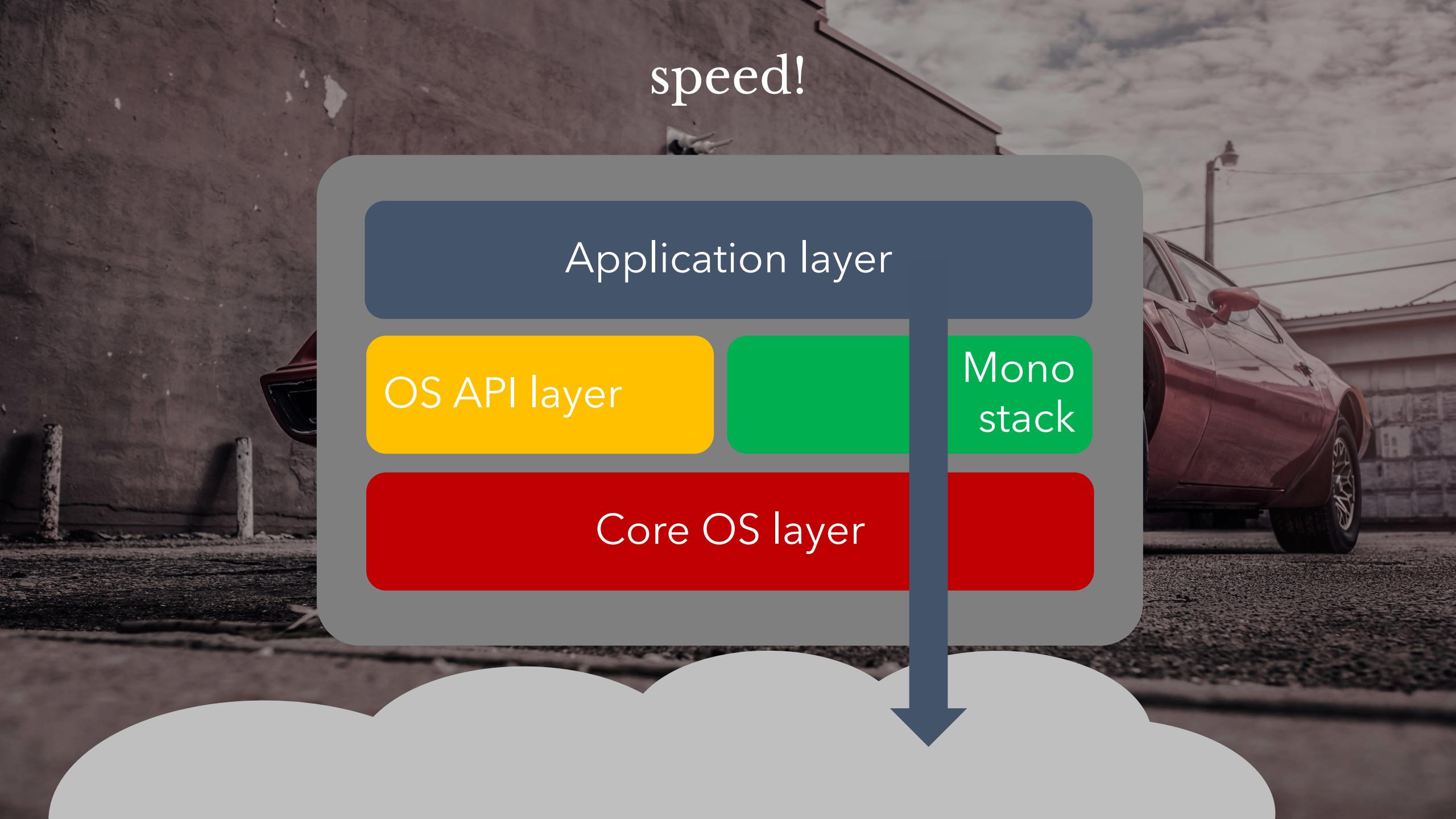
Application layer

OS API layer

Mono
stack

Core OS layer

Native HttpClientHandler



speed!

Application layer

OS API layer

Mono
stack

Core OS layer

A red sports car, possibly a Ford GT, is parked on a street in front of a concrete building. A standard electrical power outlet is mounted on the side of the building directly above the front left headlight of the car. The scene is set during the day with a clear sky.

speed!

STEP 2
cache data locally

A side-profile photograph of a classic red Pontiac Firebird Trans Am. The car is positioned in front of a light-colored, textured concrete wall. A single electrical outlet is visible on the wall above the car's front wheel. The sky is overcast with dramatic clouds. The car's iconic four-headlight front end and distinctive rear wing are clearly visible.

speed!

> Install-Package Akavache

(thanks again Paul Betts!)

A vintage-style motorhome with red and yellow stripes is parked in a desert landscape. The sky is filled with large, billowing clouds, some of which are illuminated by a setting or rising sun, giving them a fiery orange and red glow. The motorhome is positioned in the center-right of the frame, facing towards the left. In front of it, there's a small campsite setup with a folding chair and a small table.

GOAL #3

work offline

A vintage motorhome with red and yellow stripes is parked in a field of tall grass. The sky above is filled with large, billowing clouds, some of which are lit from behind by the setting or rising sun, giving them a fiery orange and red glow.

work offline
> Install-Package
Xam.Plugin.Connectivity

(thanks James Montemagno!)

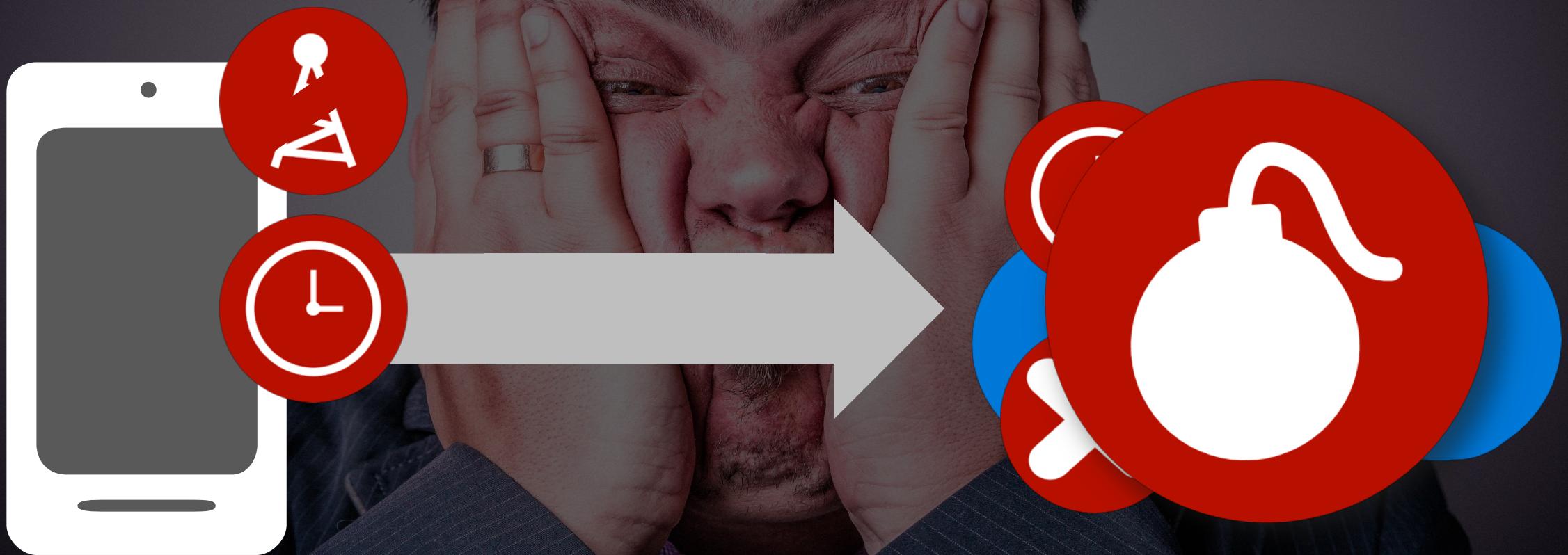
A close-up photograph of a man with dark hair and a beard. He is wearing a dark blue pinstripe suit jacket over a purple and white checkered shirt. His hands are positioned in front of his face, with his fingers covering his eyes. He appears to be in a state of distress or despair. The background is a solid, neutral grey.

GOAL #4

deal with errors

deal with errors

WHAT COULD GO WRONG?



deal with errors

WHAT DO YOU DO?

RETRY

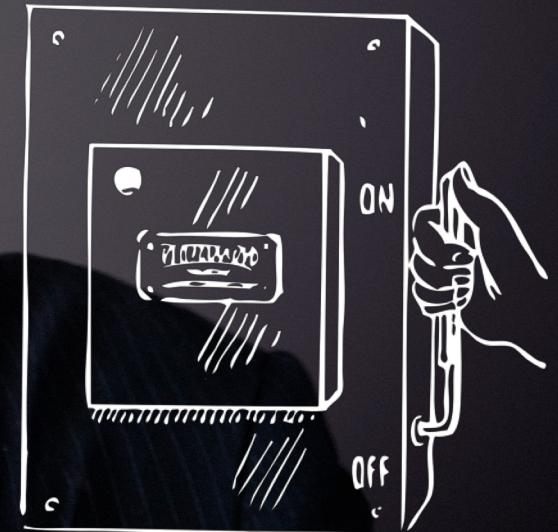
How often?

At what interval?

What if the server is already busy?

CIRCUIT BREAKER

Fail fast in case of downstream errors



A close-up photograph of a man with dark hair and a beard. He is wearing a dark blue pinstripe suit jacket over a purple shirt. His hands are covering his eyes, with his fingers resting against his temples. He has a weary or distressed expression. The background is a plain, light-colored wall.

> Install-Package Polly

(thanks Michael Wolfenden & the Polly Project!)

A close-up photograph of a man's face. He has dark hair and is wearing a dark blue pinstripe suit jacket over a purple shirt. His hands are covering his eyes and forehead, with his fingers partially hidden in his hair. His expression is one of distress, worry, or despair. The background is a plain, light-colored wall.

deal with errors

DON'T LOSE USER DATA

1. RETRY
2. SAVE DATA LOCALLY
3. RETRY LATER

this also applies to the server!

YAY!

- ✓ Less coding: Refit
- ✓ Speed:
 - Native network stack
 - Local caching: Akavache
- ✓ Work offline: Connectivity Plugin
- ✓ Deal with errors: Polly





LAB
explore
ConquerTheNetwork
app

RECOMMENDED READING

Improving HTTP Performance in Xamarin Applications

Jonathan Peppers

<http://jonathanpeppers.com/Blog/improving-http-performance-in-xamarin-applications>

Disconnected Mobile Device Seminar

Frank Krueger

<https://blog.xamarin.com/the-disconnected-mobile-device-seminar>

Resilient Network Services with Mobile Xamarin Apps

Rob Gibbens

<http://arteksoftware.com/resilient-network-services-with-xamarin>

Eight Fallacies of Distributed Computing

Gareth Wilson

<https://blog.fogcreek.com/eight-fallacies-of-distributed-computing-tech-talk>