

HOL02 – HOL Xamarin Resilient Connected Apps

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Respect the Past.
Code the Future.



Level: Introductory - Intermediate



HAPPY USER



GRUMPY USER

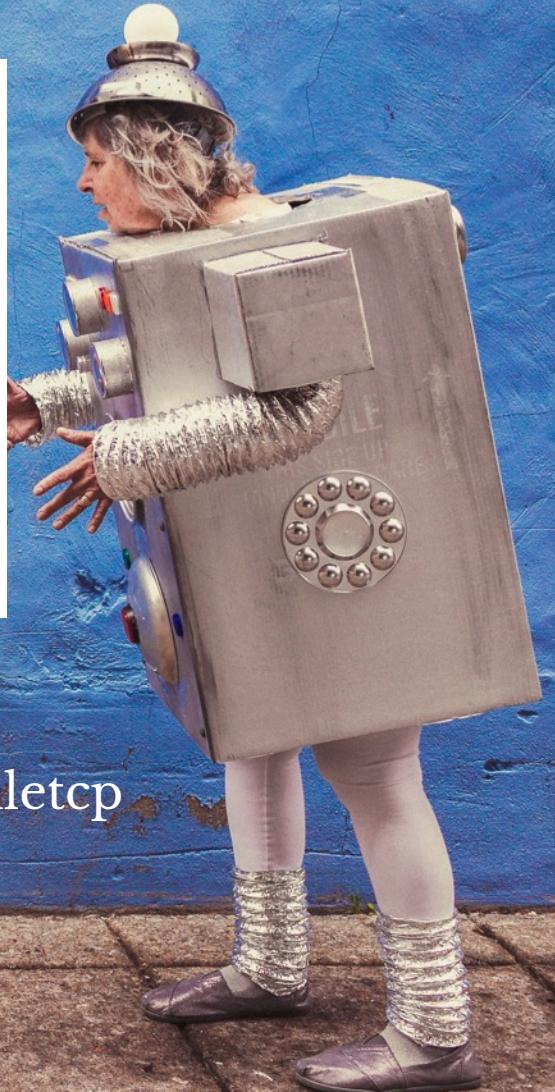
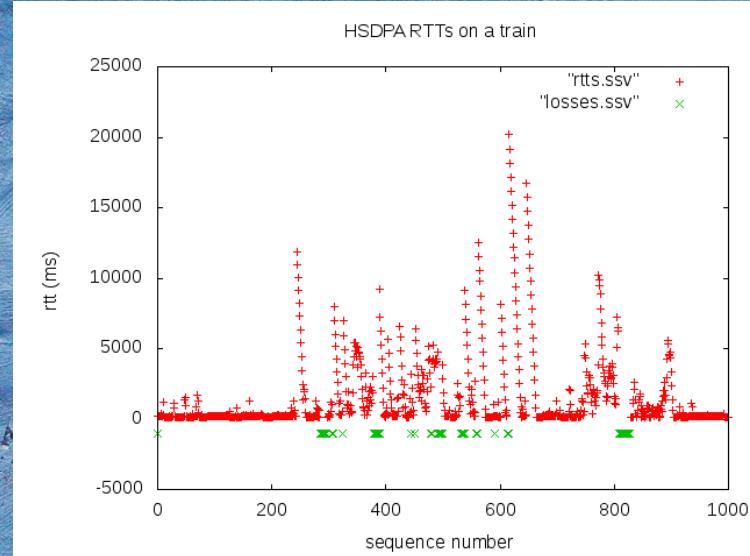


8 FALLACIES OF DISTRIBUTED COMPUTING

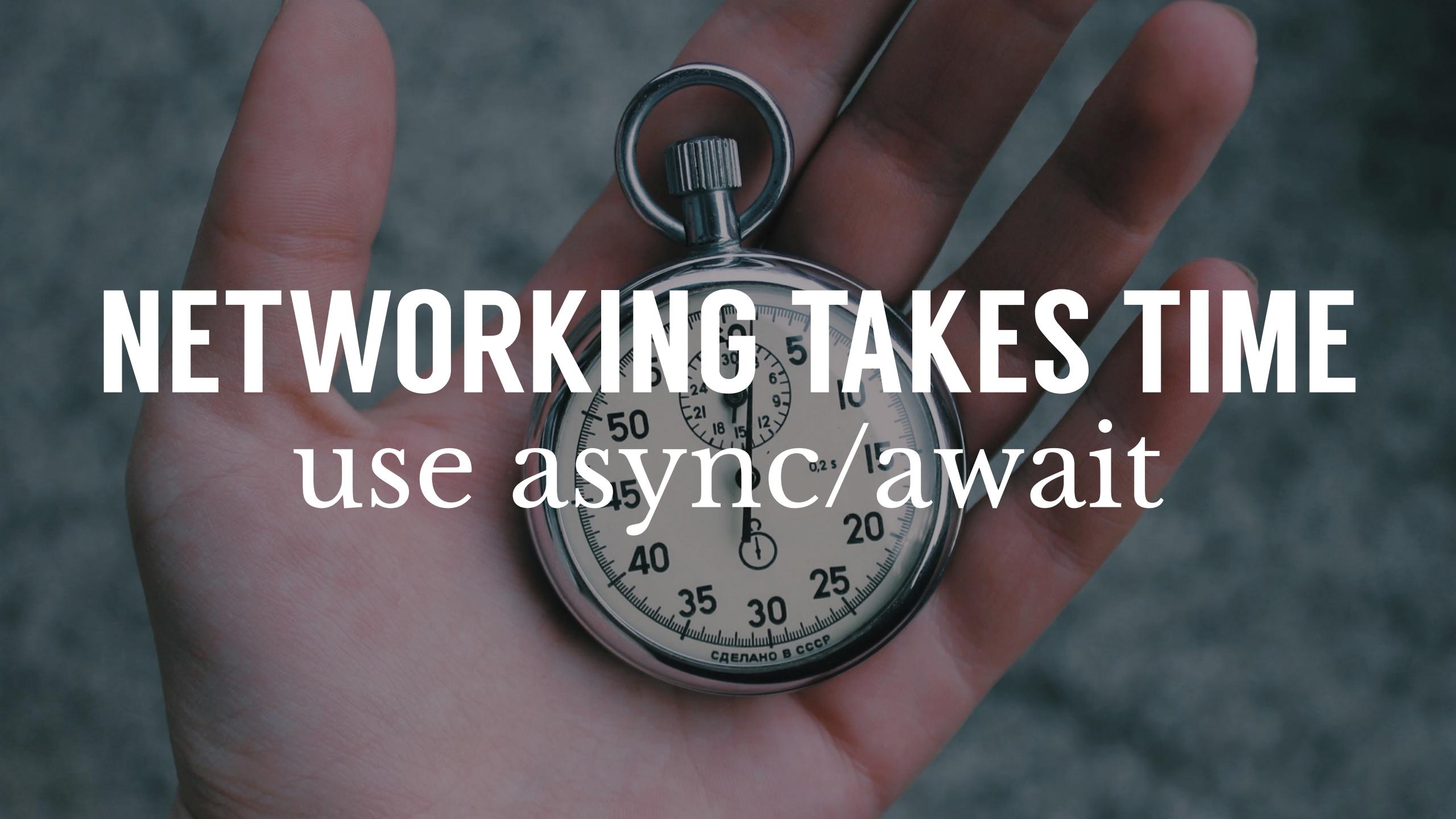
1. THE NETWORK IS RELIABLE.
2. LATENCY IS ZERO.
3. BANDWIDTH IS INFINITE.
4. THE NETWORK IS SECURE.
5. TOPOLOGY DOESN'T CHANGE.
6. THERE IS ONE ADMINISTRATOR.
7. TRANSPORT COST IS ZERO.
8. THE NETWORK IS HOMOGENEOUS.



ESPECIALLY ON MOBILE, THIS IS CHALLENGING



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

A close-up photograph of a person's hand holding a silver-colored mechanical stopwatch. The stopwatch has a clear cover showing two concentric scales: an outer scale from 1 to 60 seconds and an inner scale from 0.2 to 15 seconds. The brand name "СДЕЛАНО В СССР" (Made in USSR) is visible at the bottom of the dial. The background is dark and slightly blurred.

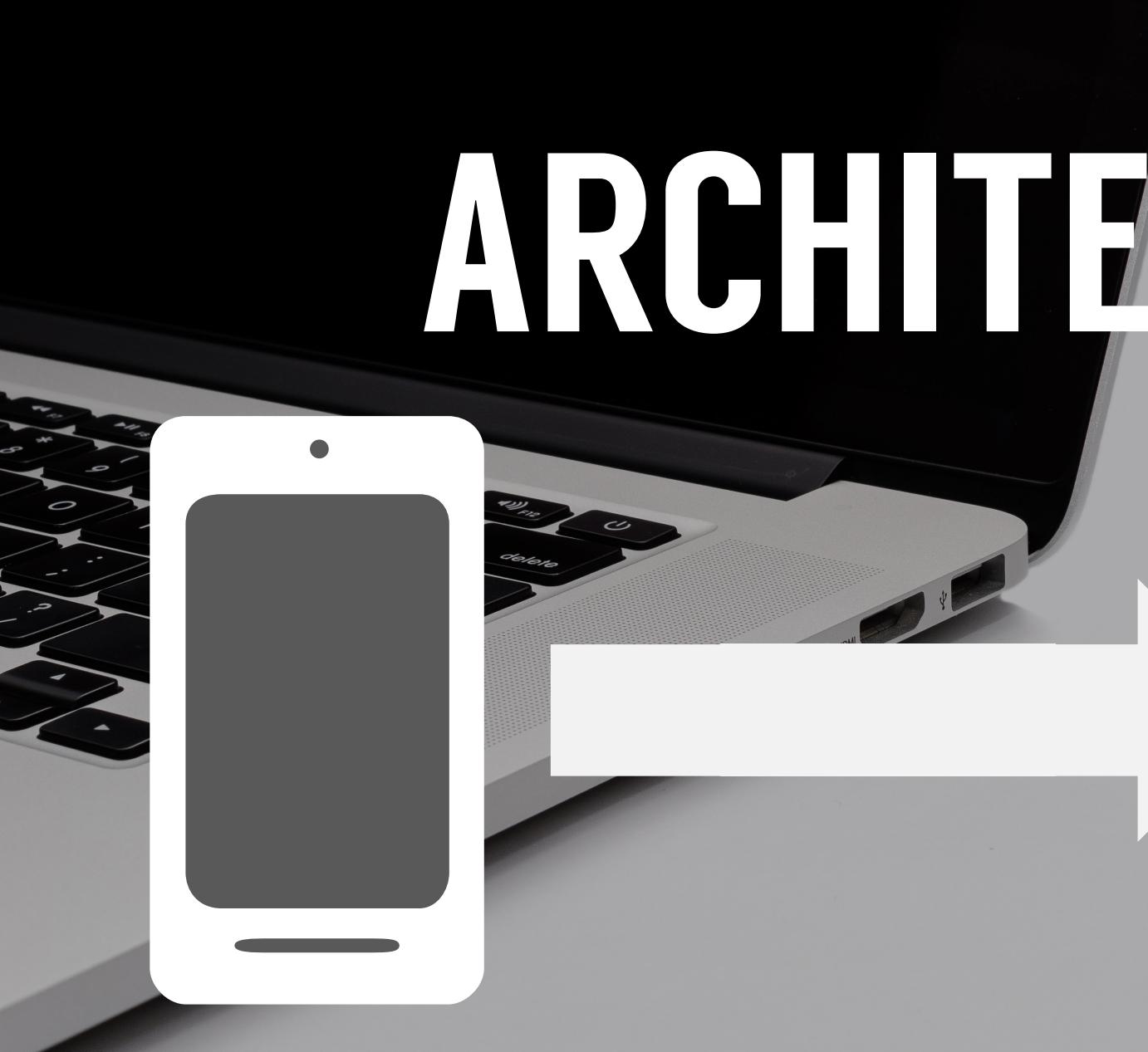
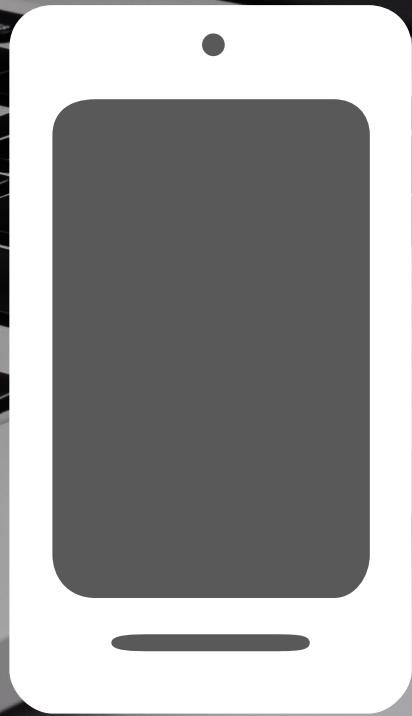
NETWORKING TAKES TIME
use `async/await`

SAMPLE REPO



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

ARCHITECTURE



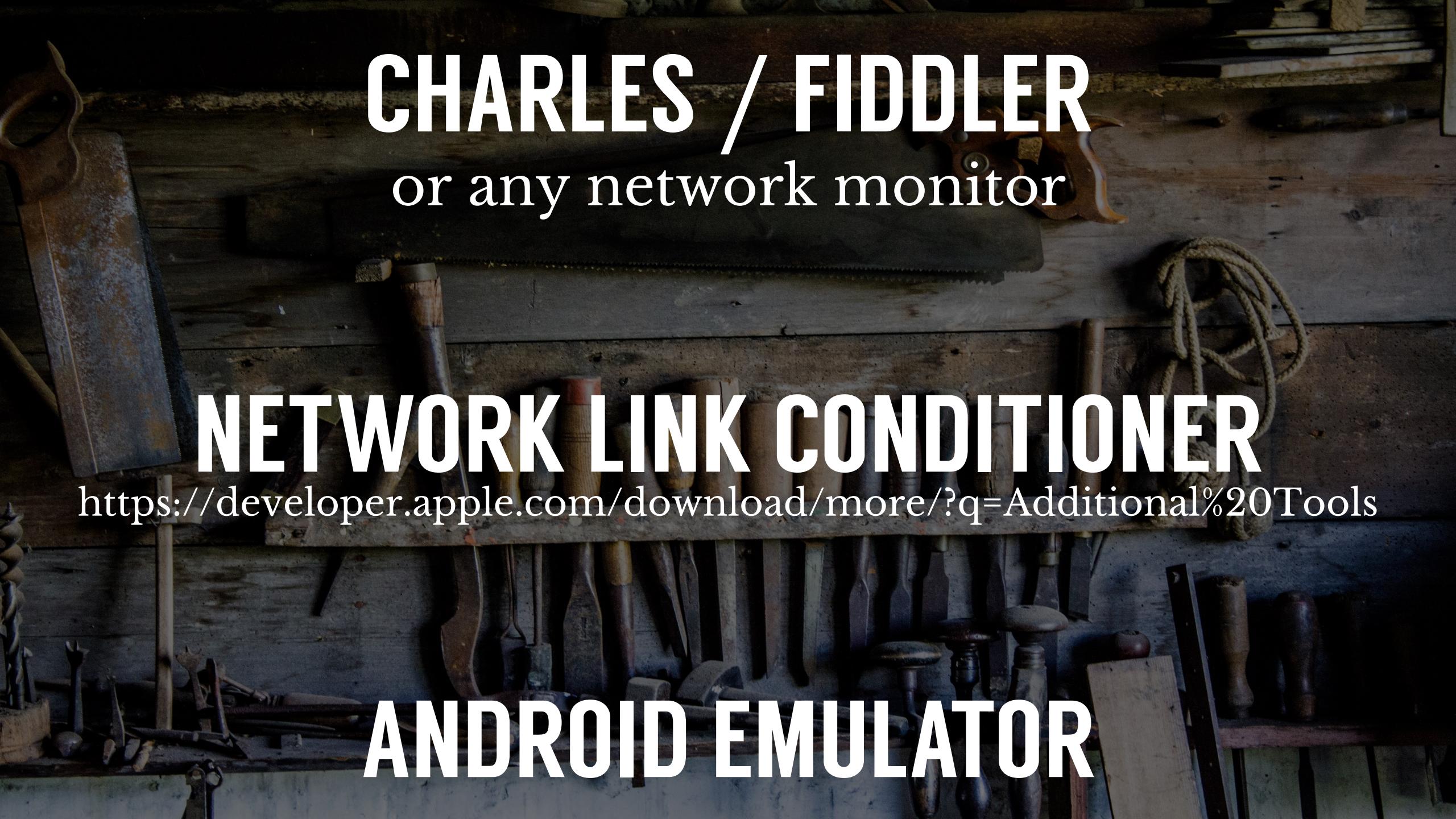
OUR GOALS

- 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!)

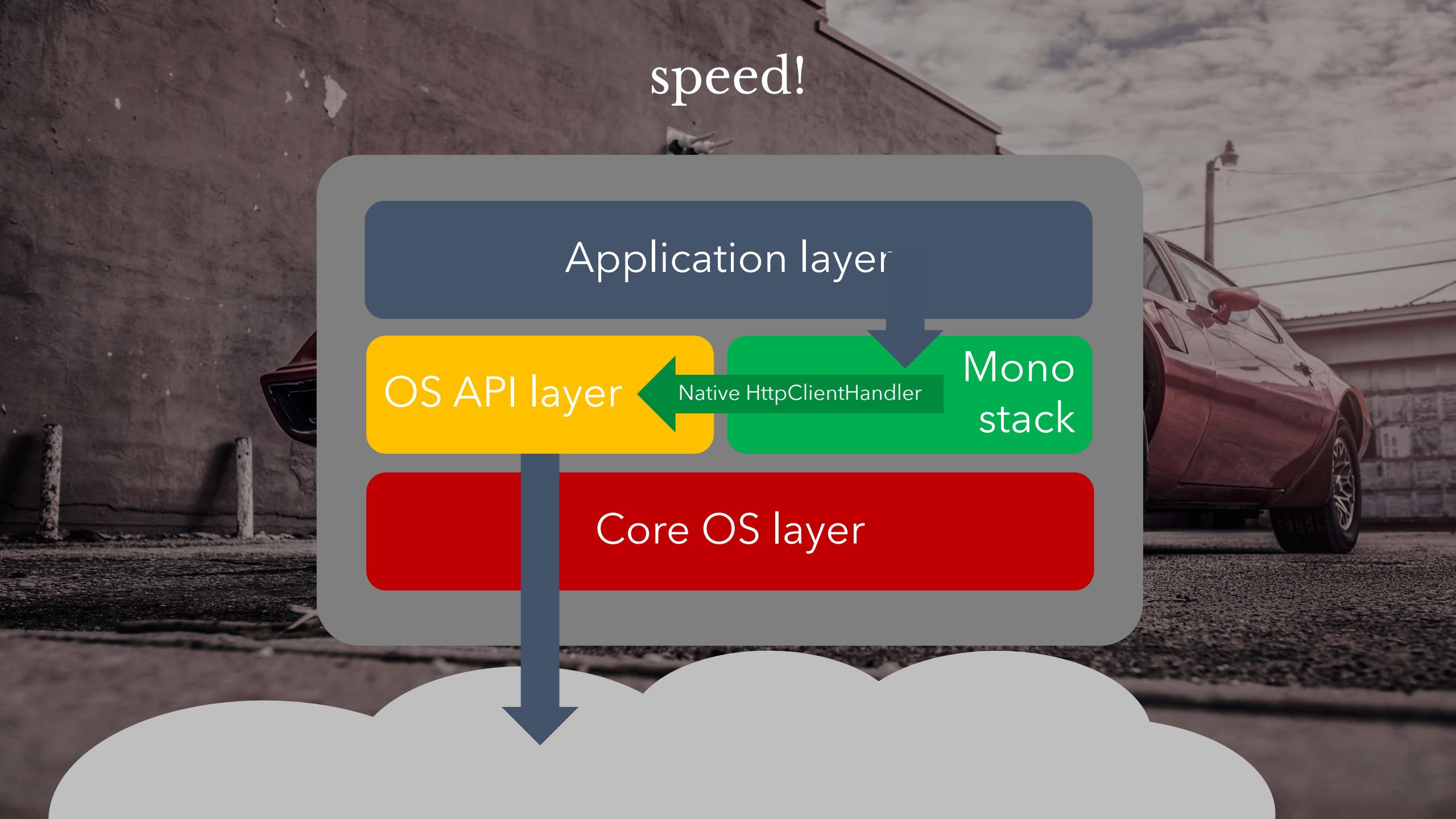
A red sports car, possibly a Ford GT or similar model, is parked on a gravel surface in front of a weathered, brown brick building. The car's front grille features a prominent Ford oval logo. The scene is set during the day under a clear sky.

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 scene is set during the day with a clear sky.

speed!

STEP 1
use native stack



speed!

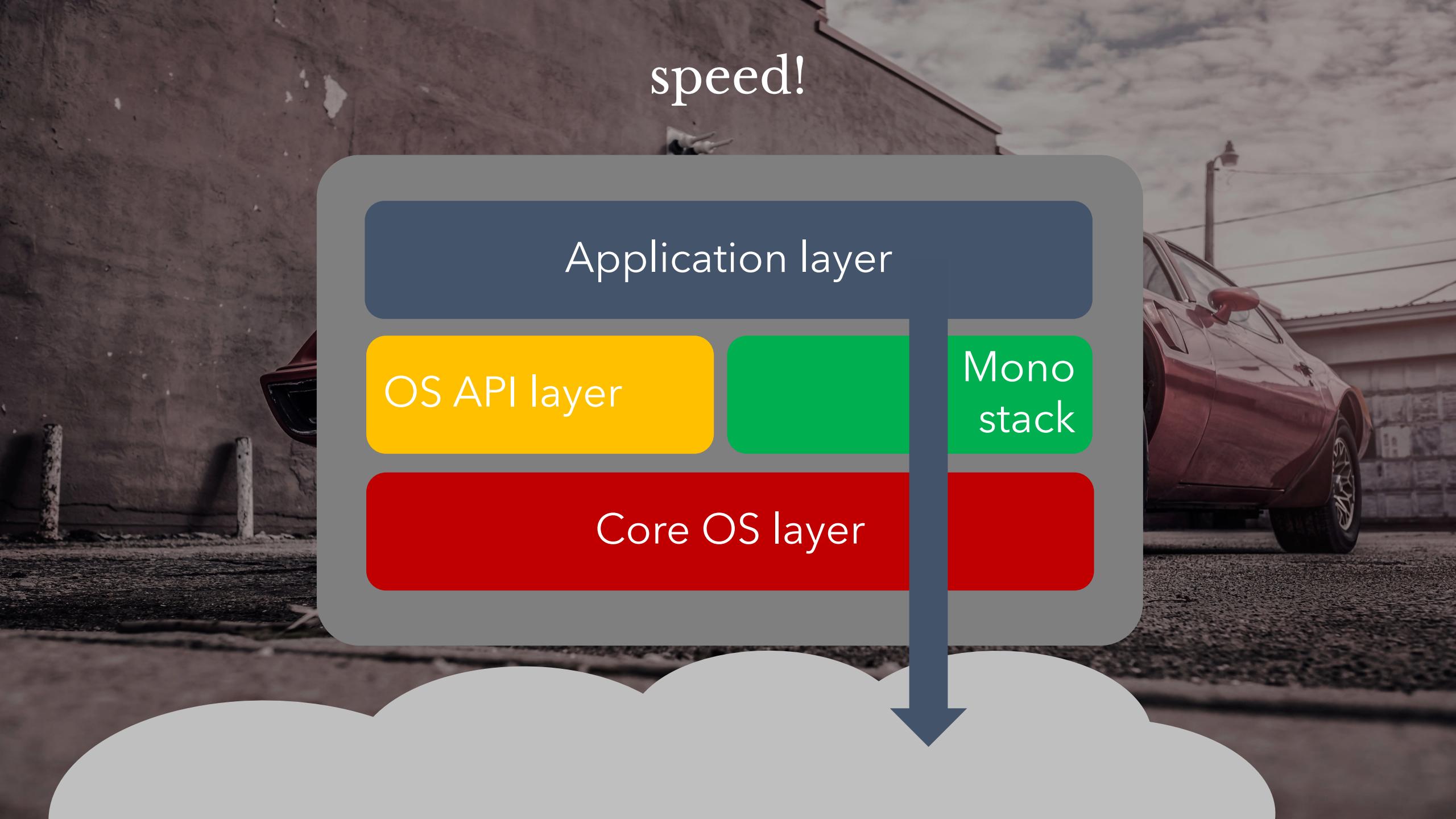
Application layer

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 red Pontiac Firebird Trans Am is parked on a gravel surface in front of a light-colored brick building. A power outlet is visible on the side of the building above the car. The car's headlights and front grille are prominent. The background shows a cloudy sky and some utility poles.

speed!

> Install-Package Akavache

(thanks again Paul Betts!)

A vintage-style motorhome with a light-colored exterior, red and yellow stripes, and a slide-out section is parked in a field of tall, dry grass. The motorhome has a large front windshield and several windows. In front of it, there's a small outdoor table and chairs. The background features a vast landscape with mountains and a sky filled with large, billowing clouds, some of which are illuminated with a fiery orange glow.

GOAL #3
work offline

A vintage motorhome with a red, yellow, and white stripe pattern is parked in a field of tall grass. The sky above is filled with large, billowing clouds in shades of red, orange, and grey, suggesting either a sunrise or sunset. The overall atmosphere is nostalgic and slightly melancholic.

work offline

> Install-Package
Xam.Plugin.Connectivity

(thanks James Montemagno!)

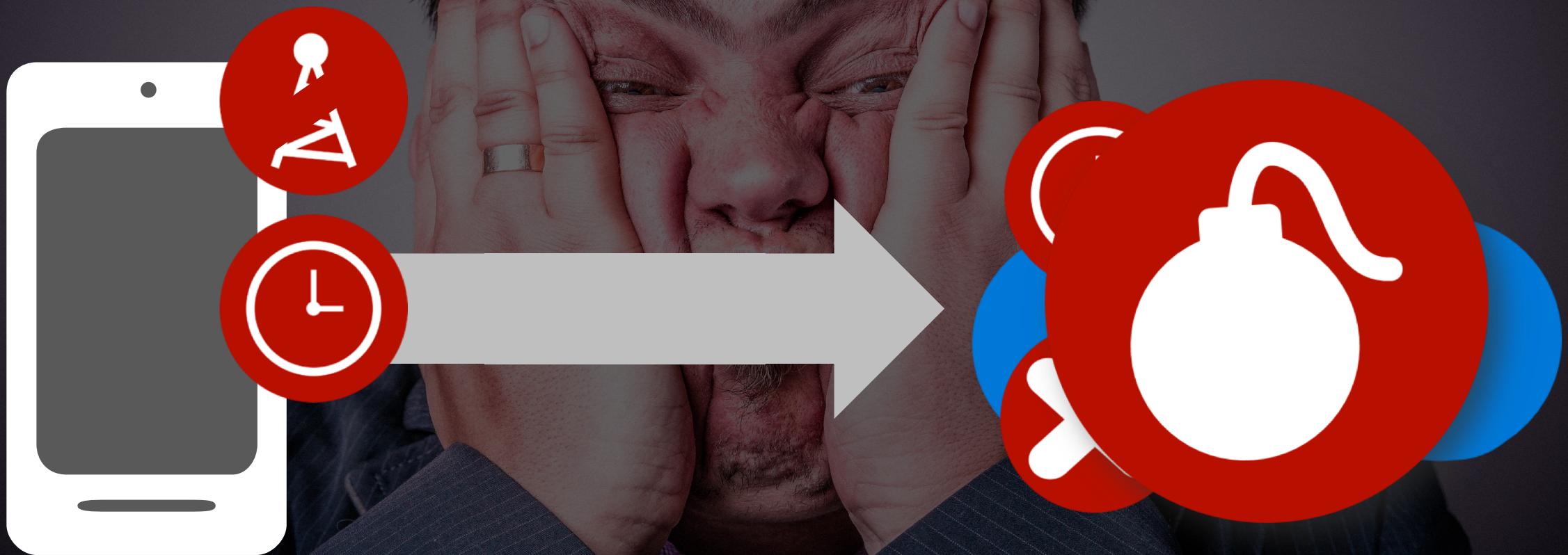
A close-up photograph of a man with dark hair and a beard. He is wearing a dark blue pinstripe suit jacket over a purple and white checkered shirt. His hands are positioned on either side of his forehead, with his fingers resting against his temples and palms facing each other. He appears to be in a state of distress or deep thought. 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

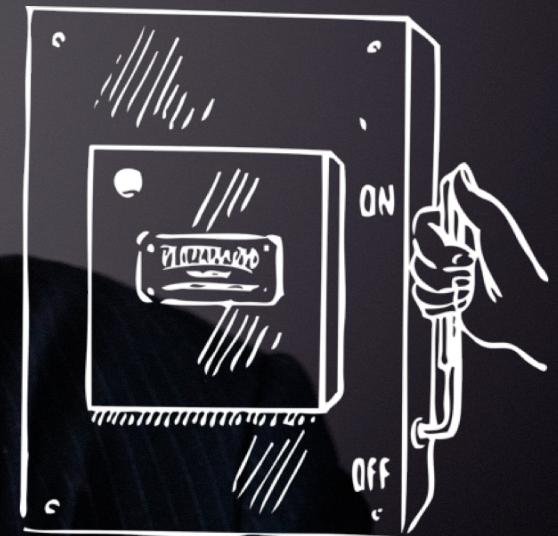
How often?

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 solid, neutral grey.

> 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 solid dark grey.

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>