

Modern .NET Software Architecture

Where are we today?

Christoph Pletz, CL-SOL
Manuel Meyer, ZH-AD



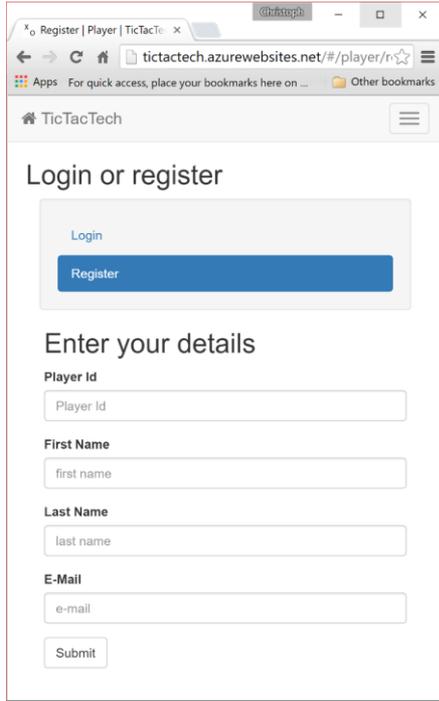
BASLE ▪ BERN ▪ BRUGG ▪ DÜSSELDORF ▪ FRANKFURT A.M. ▪ FREIBURG I.BR. ▪ GENEVA
HAMBURG ▪ COPENHAGEN ▪ LAUSANNE ▪ MUNICH ▪ STUTTGART ▪ VIENNA ▪ ZURICH

trivadis
makes IT easier. ■ ■ ■

■ Agenda

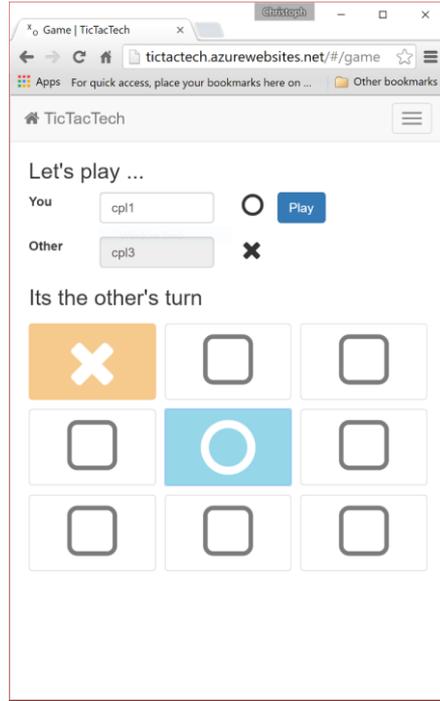
1. TicTacTech
2. A Brief History of Software Engineering
3. Microservice Characteristics
4. Microservice Examples
5. Inside TicTacTech
6. Summary

Player



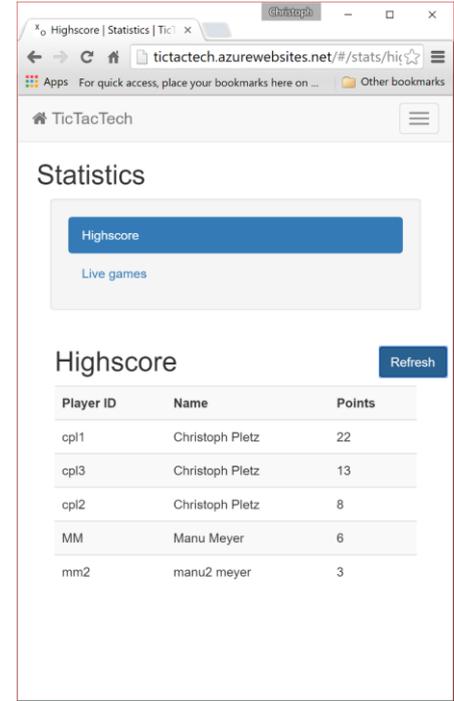
The screenshot shows a web browser window with the URL `tictactech.azurewebsites.net/#/player/r`. The page has a header with the site name and a menu icon. The main content area is titled "Login or register" and contains two buttons: "Login" and "Register". Below this is a section titled "Enter your details" with four input fields: "Player Id", "First Name", "Last Name", and "E-Mail". A "Submit" button is located at the bottom of the form.

Game



The screenshot shows a web browser window with the URL `tictactech.azurewebsites.net/#/game`. The page has a header with the site name and a menu icon. The main content area is titled "Let's play ..." and contains two input fields: "You" (with value "cpl1") and "Other" (with value "cpl3"). There are radio buttons and a "Play" button. Below this is a section titled "Its the other's turn" with a 3x3 Tic Tac Toe grid. The grid contains an 'X' in the top-left cell, an 'O' in the middle-middle cell, and empty cells elsewhere.

Statistics



The screenshot shows a web browser window with the URL `tictactech.azurewebsites.net/#/stats/hic`. The page has a header with the site name and a menu icon. The main content area is titled "Statistics" and contains a "Highscore" button and a "Live games" link. Below this is a section titled "Highscore" with a "Refresh" button. The highscore table has three columns: "Player ID", "Name", and "Points".

Player ID	Name	Points
cpl1	Christoph Pletz	22
cpl3	Christoph Pletz	13
cpl2	Christoph Pletz	8
MM	Manu Meyer	6
mm2	manu2 meyer	3



<http://tictactech.azurewebsites.net/>

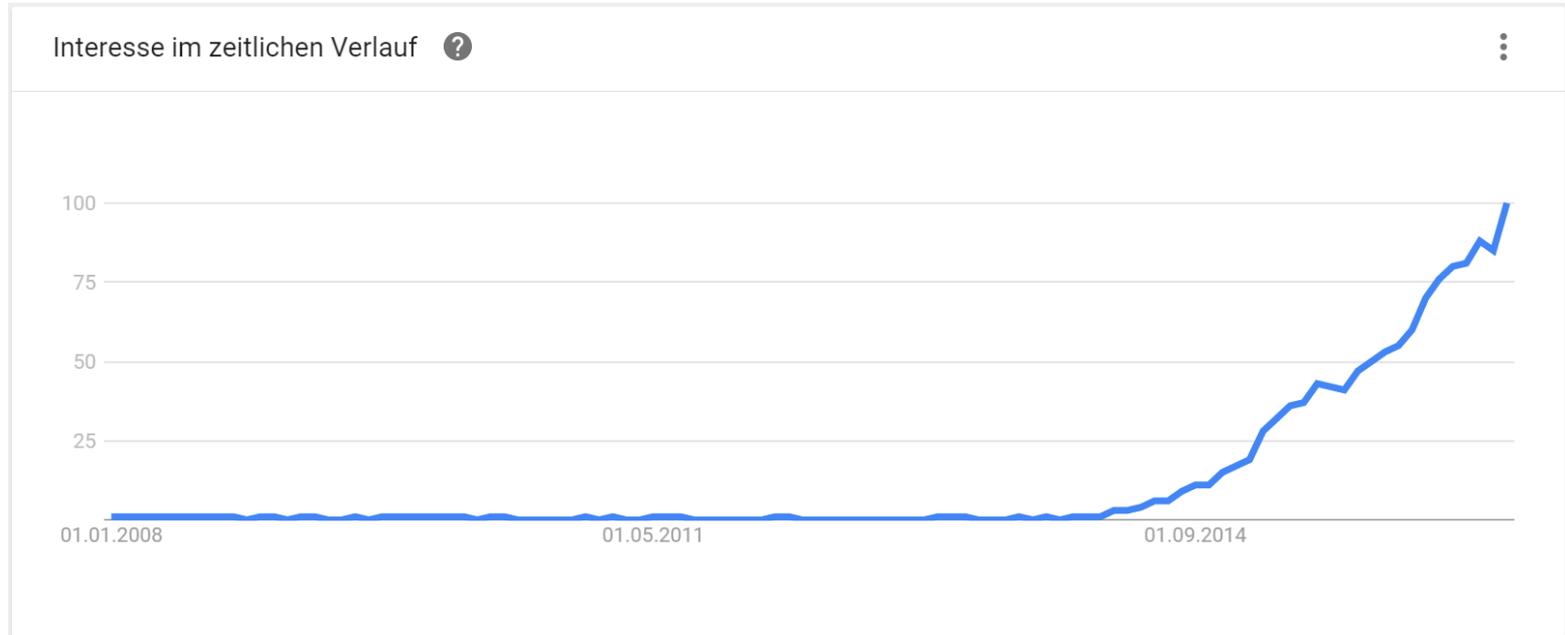
On Android I had problems with Chrome, but it works great with Opera !?



A Brief History of Software Engineering

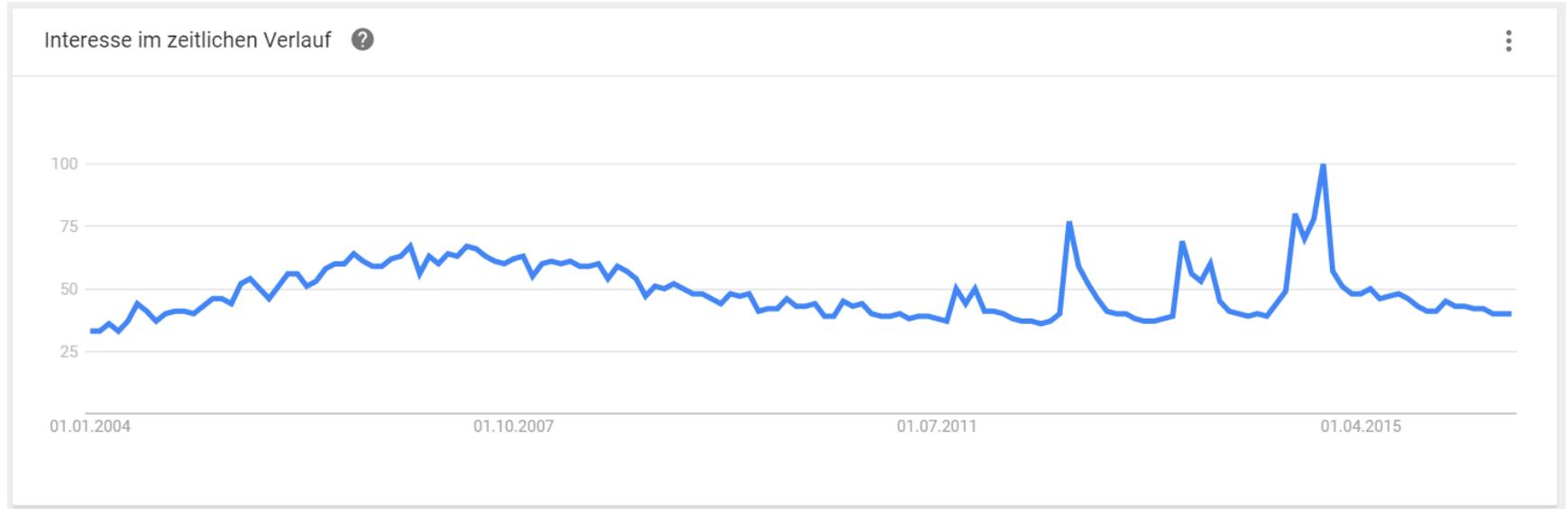
■ A Look Around Today

Google Trend „Microservices“



■ A Look Around Today

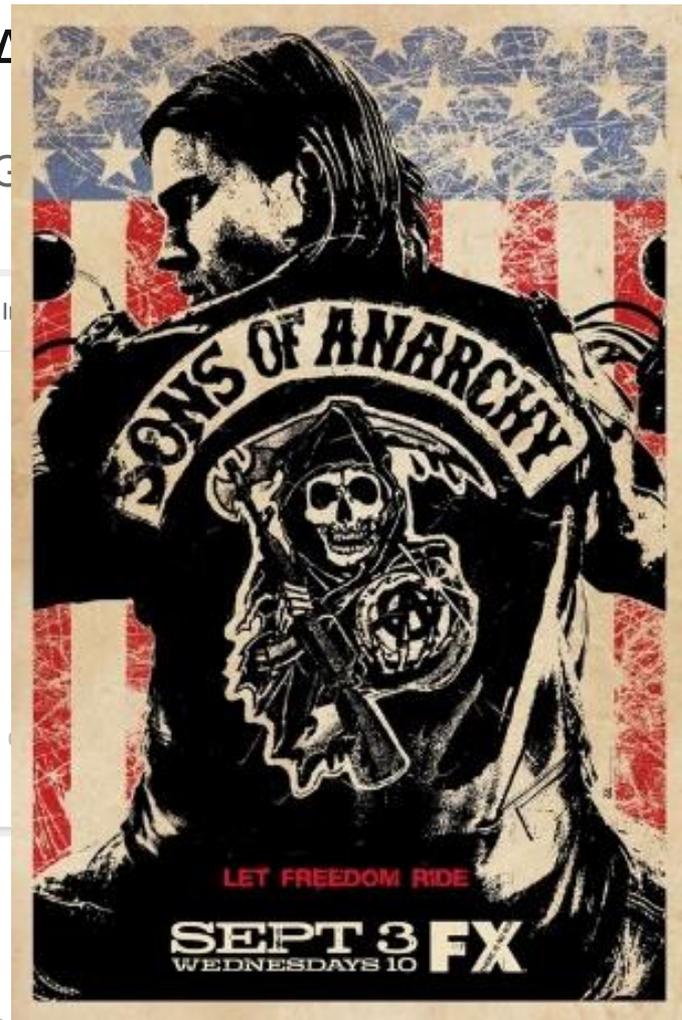
Google Trend „SOA“





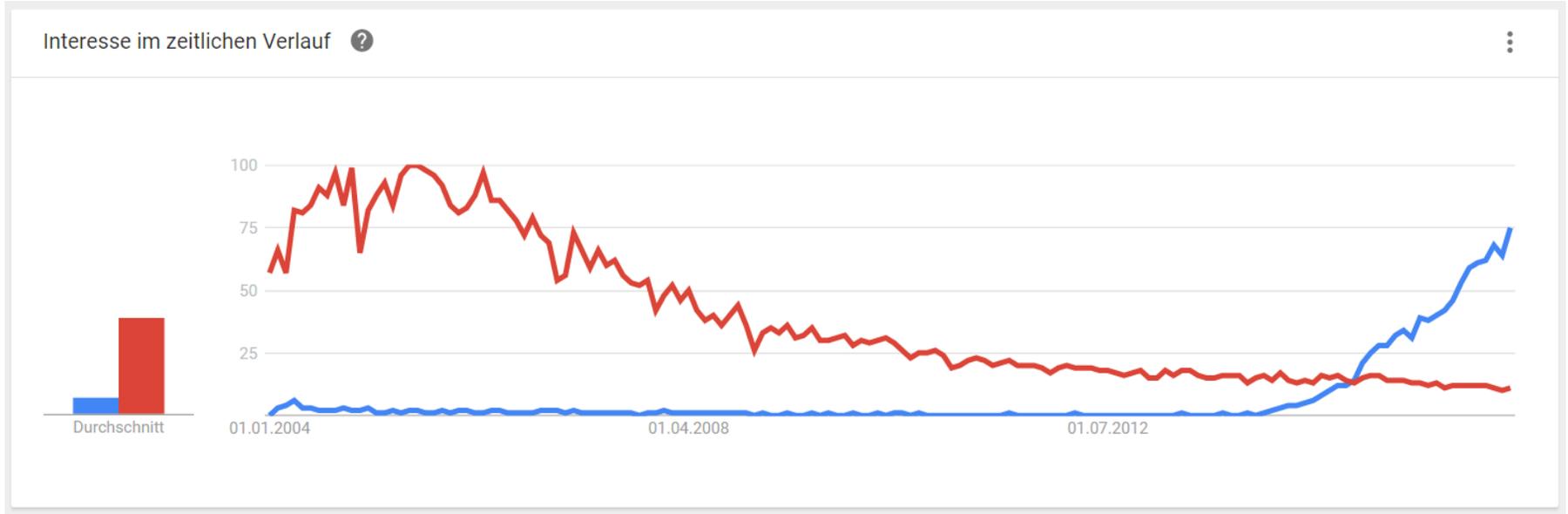
A

C

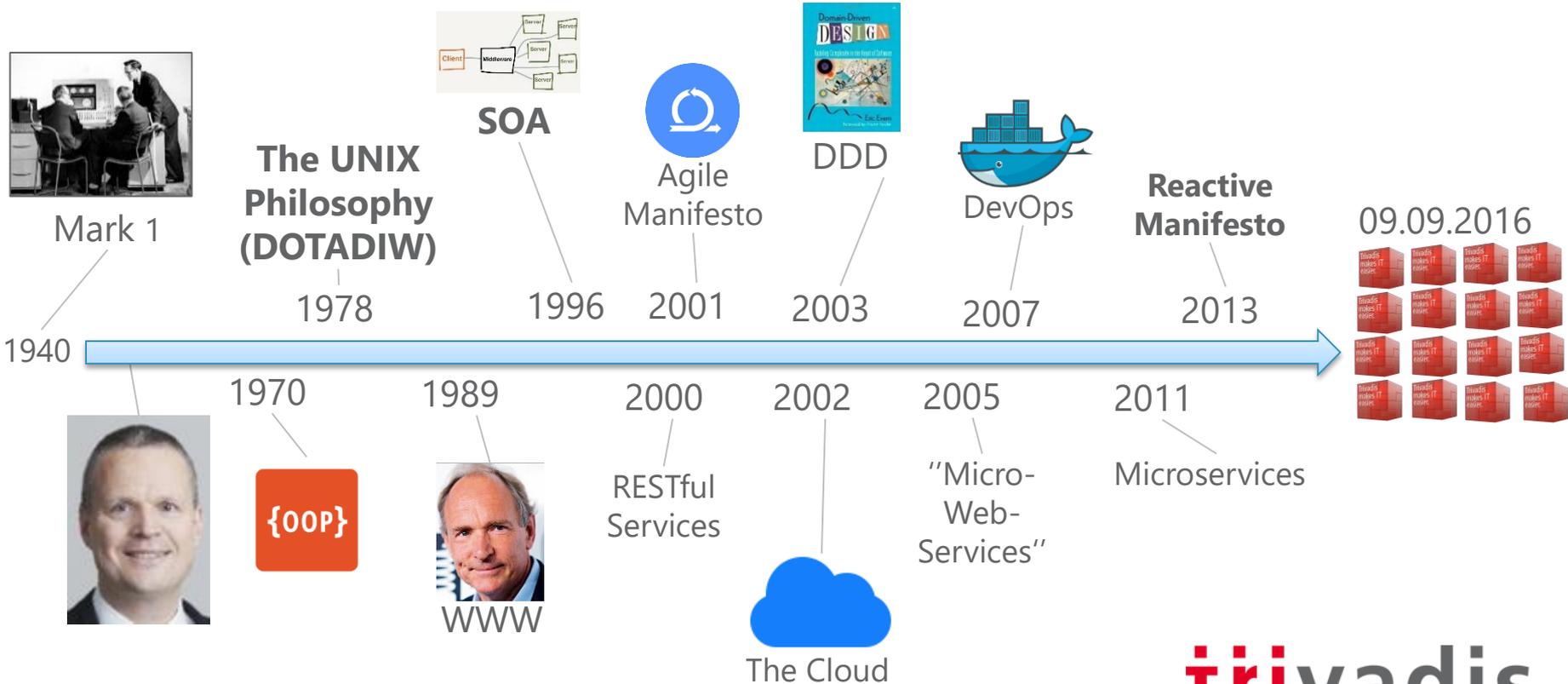


■ A Look Around Today

Google Trend „Microservices“ versus „Service Oriented Architecture“



■ A Brief History of Software Engineering







DENNIS RITCHIE & KEN THOMPSON

UNIX

Inventors of UNIX.



AWARD

1983

A.M.
TURING

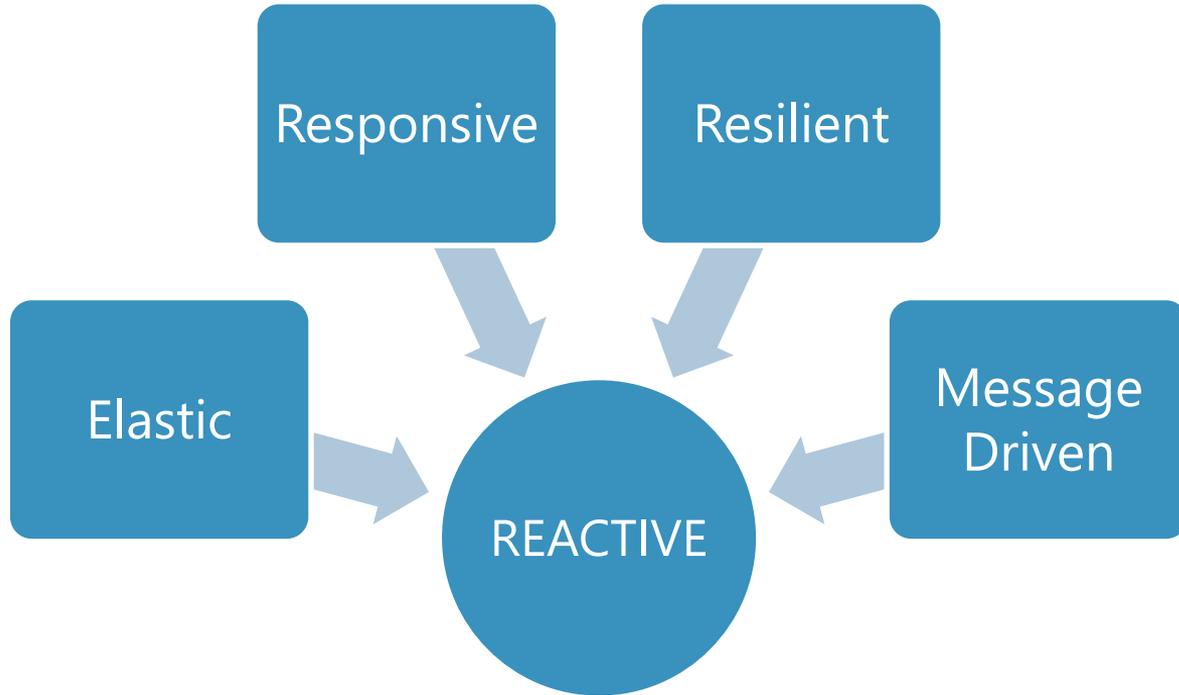


■ The Unix Philosophy (1978) - DOTADIW

„Do one thing and do it well“

- Make each program do one thing well
- Expect the output of every program to become the input to another
- Design software and systems to be tried early, don't hesitate to throw away
- Use and make tools.

■ The Reactive Manifesto



<https://www.reactivemanifesto.org/>

Microservice Characteristics

■ The Evolution of Software Architecture



■ The Evolution of Software Architecture



■ The Evolution of Software Architecture

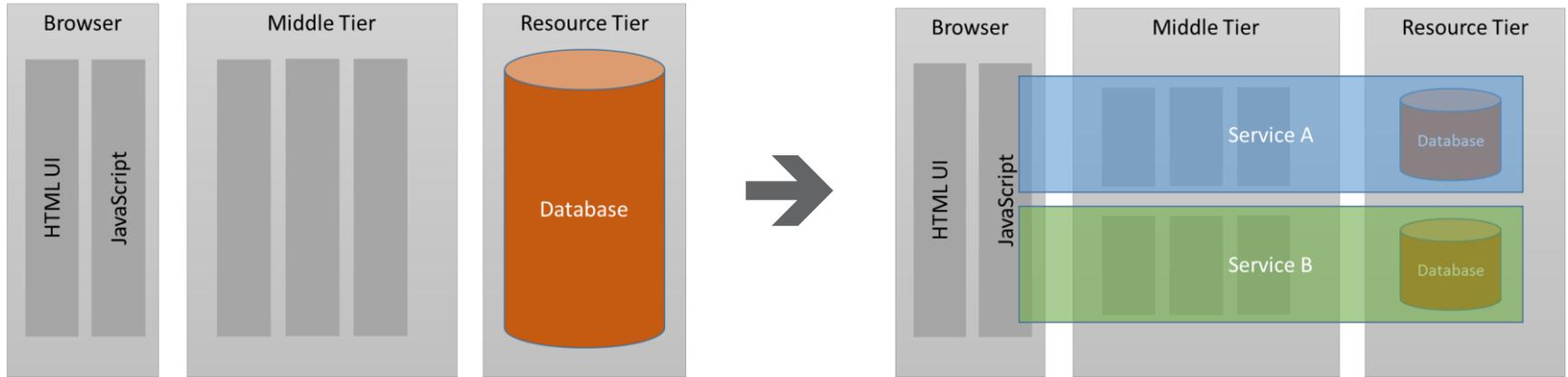


■ Microservice Characteristics

- Small and self contained, owns its datasource, owned by 1 team
- Easy to replace, individually deployable and disposable
- Organized around capabilities
- Implemented with „what fits best“
- „Smart endpoints and dumb pipes“
- Designed for failure

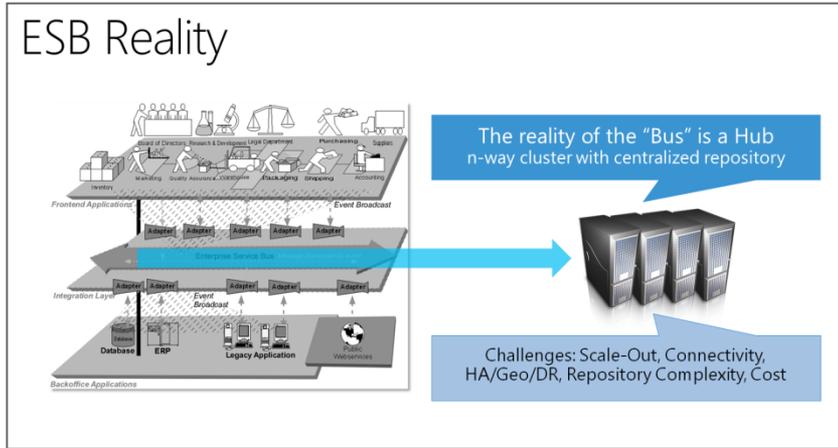
<http://martinfowler.com/articles/microservices.html/>

■ N-Tier / X-Layer → Microservice



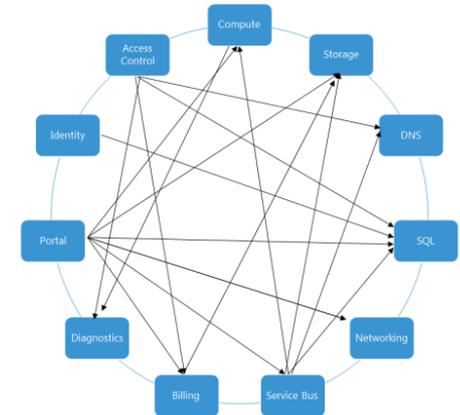
Microservice Examples

Microservice Example 1: Microsoft Azure



Case-Study Windows Azure

- Feature Services
- Shared Backend Services
- Independent Teams
- Shipping Features/Fixes Daily
- 8+ Core Datacenter Facilities
- Countless Feature Clusters
- External Partner Integration
- Thousands of very diverse customer workloads



Clemens Vasters: Utopia ESB

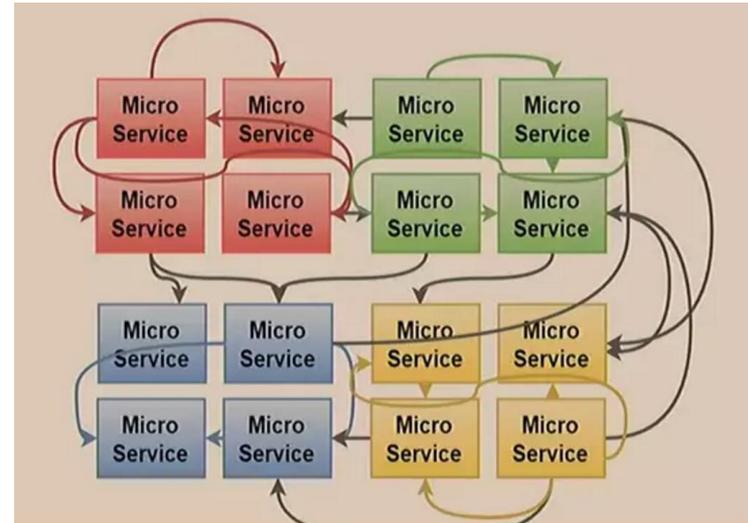
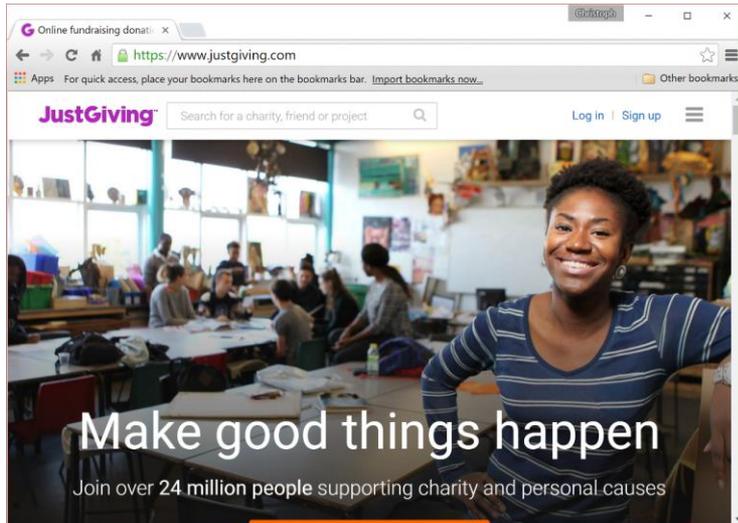
<http://channel9.msdn.com/Blogs/Subscribe/Wheres-the-ESB>

■ Microservice Example 2

«MicroMonolith - Top anti-patterns of distributed systems»
- Michal Franc

NDC Oslo 2016

<https://vimeo.com/171704583>



■ Microservice Example 3

«A High-Performance Solution
to Microservices UI
Composition»

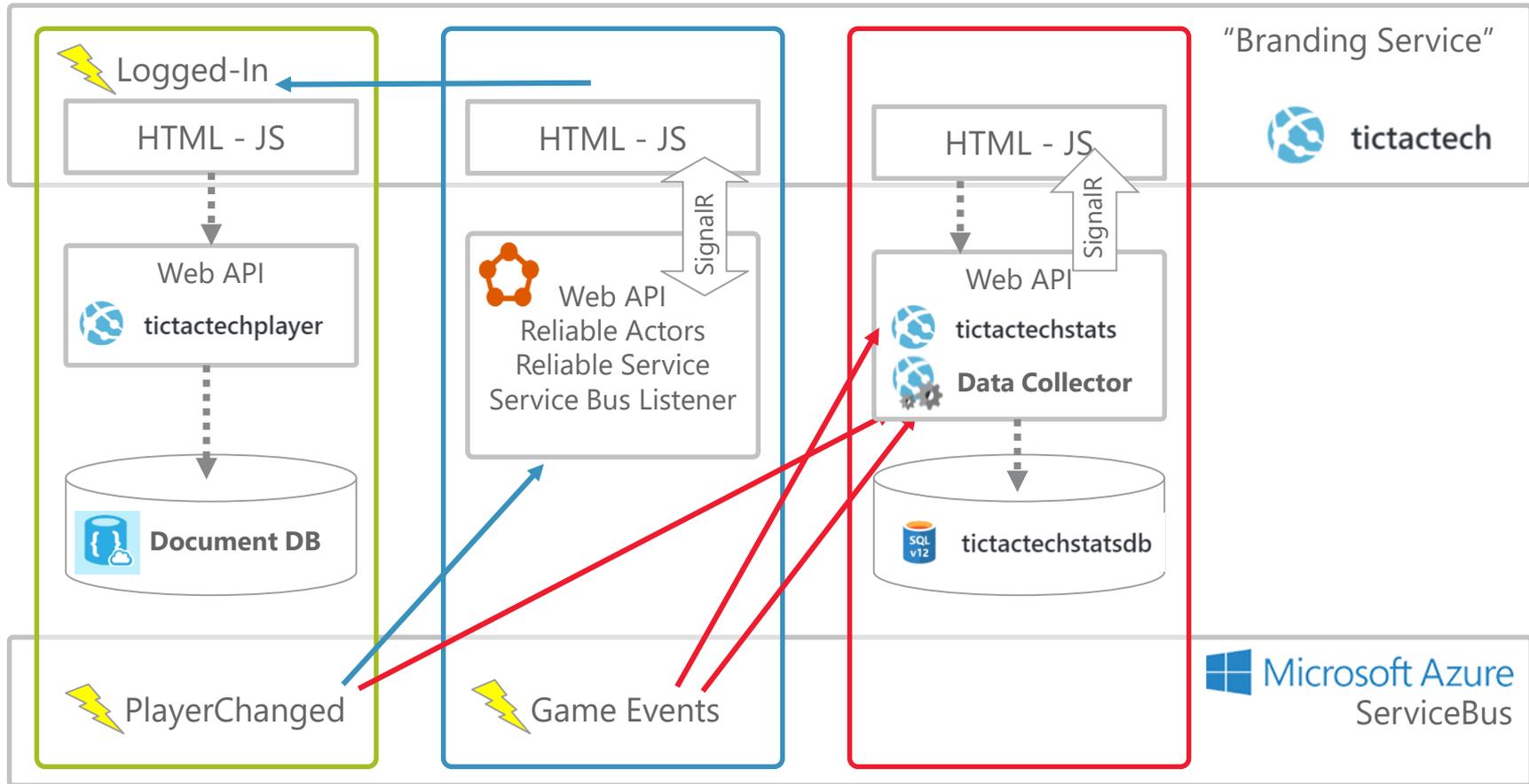
NDC Oslo 2016

<https://vimeo.com/171927597>

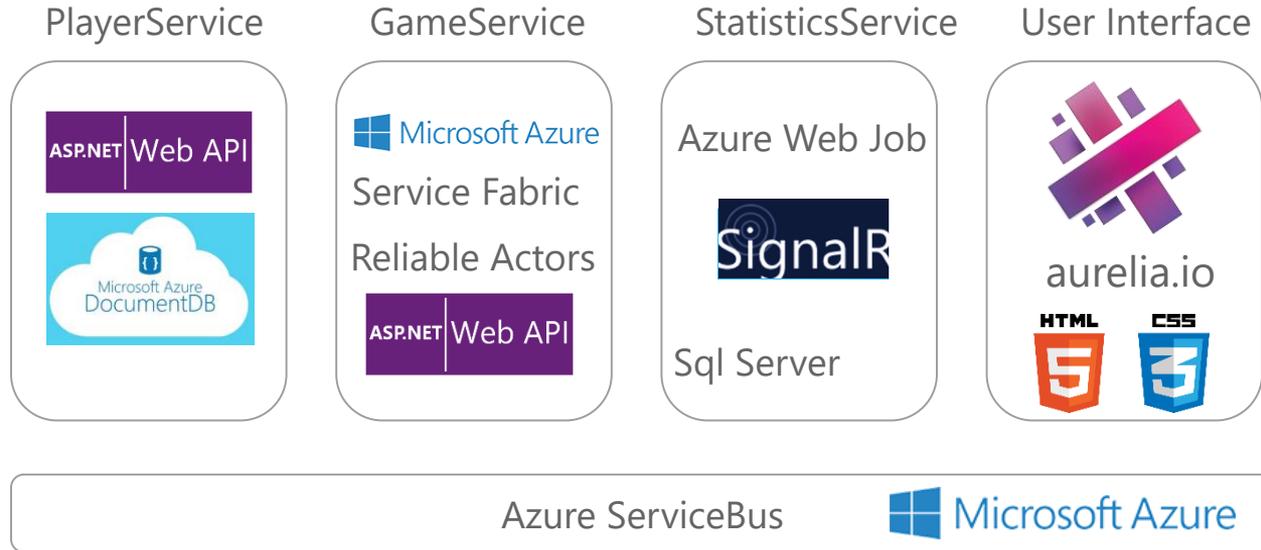


A screenshot of the AutoScout24 website. At the top, there is a navigation menu with links for Home, Zoeken (highlighted), Verkoop, Magazijn & Informatie, Service, Mijn AutoScout24, and Login Autobedrijf. Below the menu is a search interface with various filters: Mark (Alle), Model (Alle), Prijs (€) (Tot), Bouwjaar (Van, Tot), Kilometerstand (Tot), Brandstof (Alle), Postcode, and Omgeving (200 km). A search button shows '2,245,837 Resultaten'. To the right of the search interface is a promotional banner for insurance with the text 'Vind de goedkoopste verzekering voor uw auto en sluit direct af. Vergelijk nu'. Below the search interface are three sections: 'Tweedehands auto per type' with icons for Hatchback, Sedan, Stationwagon, SUV / Off-Road, Cabrio, and Coupé; 'Laatste nieuws uit het magazine' with a featured article about electric cars; and 'Find us on Facebook' with the AutoScout24.nl profile and 15,543 likes.

Inside TicTacTech



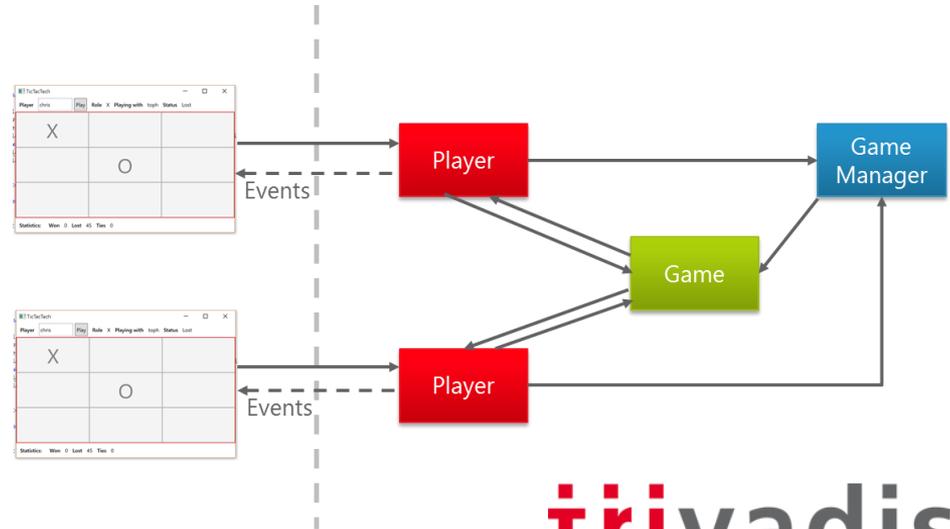
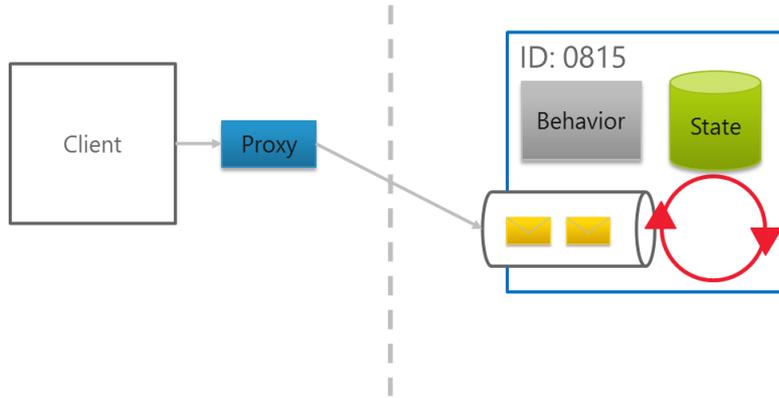
■ Microservice Example 4: TicTacTech



■ Azure Service Fabric

- Cluster Management
- Stateful Middle Tier
- Runs any EXE
- Specific APIs
 - Reliable Actors
 - Reliable Services
- Rolling Updates

Actors: “Objects done right”



Other Technologies to look at

Actors



Messaging

– Server



– Server to UI



■ Microservice Challenges

- UI Composition – How to separate UI parts?
- Complexity
- Logging / Monitoring
- Integration testing
- Deployment

Thank You!

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