Architecture for Modular Frontend Applications
std::cout << "Hello Berlin!";

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- Worked for Accenture and Microsoft
- IoT and Security Architecture

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- Solution Architect at smapiot
- Previously at ZEISS and innogy
- Digital Transformation Architecture
System Architecture Example

**Frontend**
- Monolithic architecture
- Integrated and consistent user experience
- Developed by one central team
- Larger deployment releases

**Microservices**
- Scoped around business capabilities
- Developed by autonomous teams
- Own development & deployment lifecycle
- Loosely coupled
- Technology independent

- Single Frontend Solution
- Service A
- Service B
- Service C
- Service X
- Service Y
Examples

Distributed Web Applications
Software Center

Software Download

Which software do you want to download?

- **ZEISS CALYPSO**
  - The easy way to get from drawing to measurement.

- **ZEISS CALIGO**
  - Specialist for freeform surfaces.

- **ZEISS PiWeb**
  - Perfect control of all important data. Everywhere.

- **ZEISS colin3D**
  - Software for optical 3D sensor systems.

- **ZEISS NEO insights**
  - Easily visualize and analyze CT volume data.

- **ZEISS Reverse Engineering**
  - Back to CAD model

- **ZEISS AirSaver**
- **ZEISS BLADE PRO**
- **ZEISS CMM-OS**
- **ZEISS GEAR® PRO**
Microfrontend Architecture
Microfrontend Architecture

Distributed Web Application

Frontend A  Frontend B  Frontend C

Service A  Service B  Service C  Service D

Frontend
- Microfrontend

Backend
- Microservice
Desired Solution

Microservices Aspects

Aspects of a Monolith Approach

Best of both worlds for a modular distributed web application

Business capabilities as modules

Loose coupling with dynamic loading

Shared architecture foundation

Consistent UI & UX

Development by independent teams
Proposed Frontend Architecture

Modular Distributed Web Application

Frontend
- Shared Libraries
  - Module A
  - Module B
  - Module C
- Core and Common Capabilities
  - Pattern Library

Backend
- Service A
- Service B
- Service C
- Service D

Patterns:
- App Shell Component
- Business Capability Module
- Microservice
Principles and Challenges

First class development experience
“setup of local dev environment in minutes”

Comprehensive development tooling
e.g. scaffolding modules based on templates

Supporting Backend Services
e.g. feed for dynamic loading of modules

Support for multiple frameworks
e.g. React, Angular, Vue

Distributed development of modules
Realized Architecture
High Level Architecture

- Frontend App
- Application Shell
- Modules
- Users
- Tooling
- Feed Service
  - Services
  - Module Assets
- Module Developer
- Module Storage

O'Reilly Software Architecture

oreillysacon.com
#OReillySACon
piral.io

A framework for modular Microfrontends

https://piral.io
https://docs.piral.io
High Level Architecture with Piral

- Frontend App
  - Piral Instance
    - Pilet
  - Feed Service
    - Module Feed
    - Features
    - Rules
    - API Key Management
    - Module Assets
    - CDN

Module Developer

Users

Piral-CLI

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Components of a Piral Frontend

Pilets as **modular feature components**

Implementation of the **Piral Instance**

Provides **standard patterns** and **backend integration**

The **core functionality** for a Piral based microfrontend

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**Piral Core Library**

**Pilet Feature**

**Pilet Feature**

**Pilet Feature**

**Piral Ext Library**

**Layout Pattern Library**

**Piral Framework**

**React & Other Libraries**

**Useful Extensions** like translations, connectivity

**Foundation** for Piral

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Demo
Piral Samples
https://docs.piral.io/samples
Development Approach

Single Frontend Solution (Monolith)

Service A
Service B
Service C
Service D

Frontend Development Team

Backend Service Development Teams

Frontend
Backend
Development Approach

Application Shell

Module A

Service A

Module B

Service B

Module C

Service C

Module D

Service D

Frontend Development Team

Fullstack Development Teams

Frontend

Backend
Development Lifecycles

App Shell Development

Module Development

Module A

Module B

Module C
Conclusion

Modular Frontend Architecture

Architecture for modular Web Applications

Framework for modular Web Apps
Rate today’s session

Cyberconflict: A new era of war, sabotage, and fear

9:15am - 10:10am Wednesday, March 27, 2019
Location: Ballroom
Secondary Topics: Security and Privacy

We’re living in a new era of constant sabotage, misinformation, and fear, in which everyone is a target, and you’re often the collateral damage in a growing conflict among states. From crippling infrastructure to sowing discord and doubt, cyber is now the weapon of choice for democracies, dictators, and terrorists.

David Sanger explains how the rise of cyberweapons has transformed geopolitics like nothing since the invention of the atomic bomb. Moving from the White House Situation Room to the dens of Chinese, Russian, North Korean, and Iranian hackers to the boardrooms of Silicon Valley, David reveals a world coming face-to-face with the perils of technological revolution—a conflict that the United States helped start when it began using cyberweapons against Iranian nuclear plants and North Korean missile launches. But now we find ourselves in a conflict we’re uncertain how to control, as our adversaries exploit vulnerabilities in our hyperconnected nation and we struggle to figure out how to deter these complex, short-of-war attacks.

David Sanger
The New York Times

David E. Sanger is the national security correspondent for the New York Times as well as a national security and political contributor for CNN and a frequent guest on CBS This Morning, Face the Nation, and many PBS shows.
Thank You!

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More information about Piral:
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