

Micro Frontends

Scaling Your Teams And Architecture



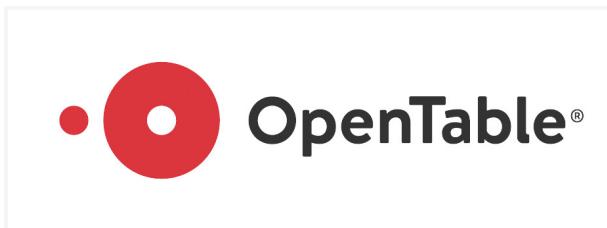
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 Charlotte, NC





Micro frontends

APR
2019

ADOPT

NOV
2017

TRIAL

NOV
2016

ASSESS

ThoughtWorks®

TECHNOLOGY RADAR

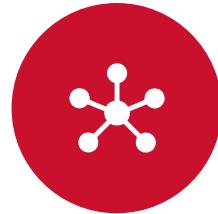
Agenda



Core
Concepts



Key
Benefits



Integration
Options



Potential
Disadvantages

Core Concepts



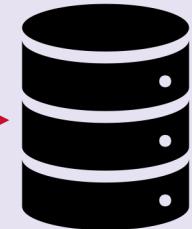
What exactly is micro frontend?



Presentation Tier

Application Tier

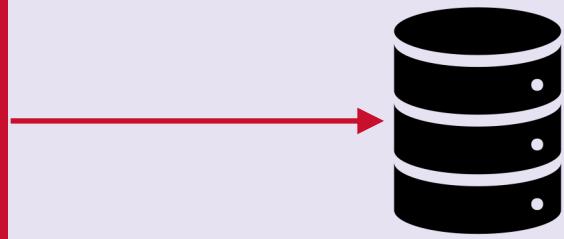
Monolith



Data Tier

Presentation Tier

Application Tier



Data Tier



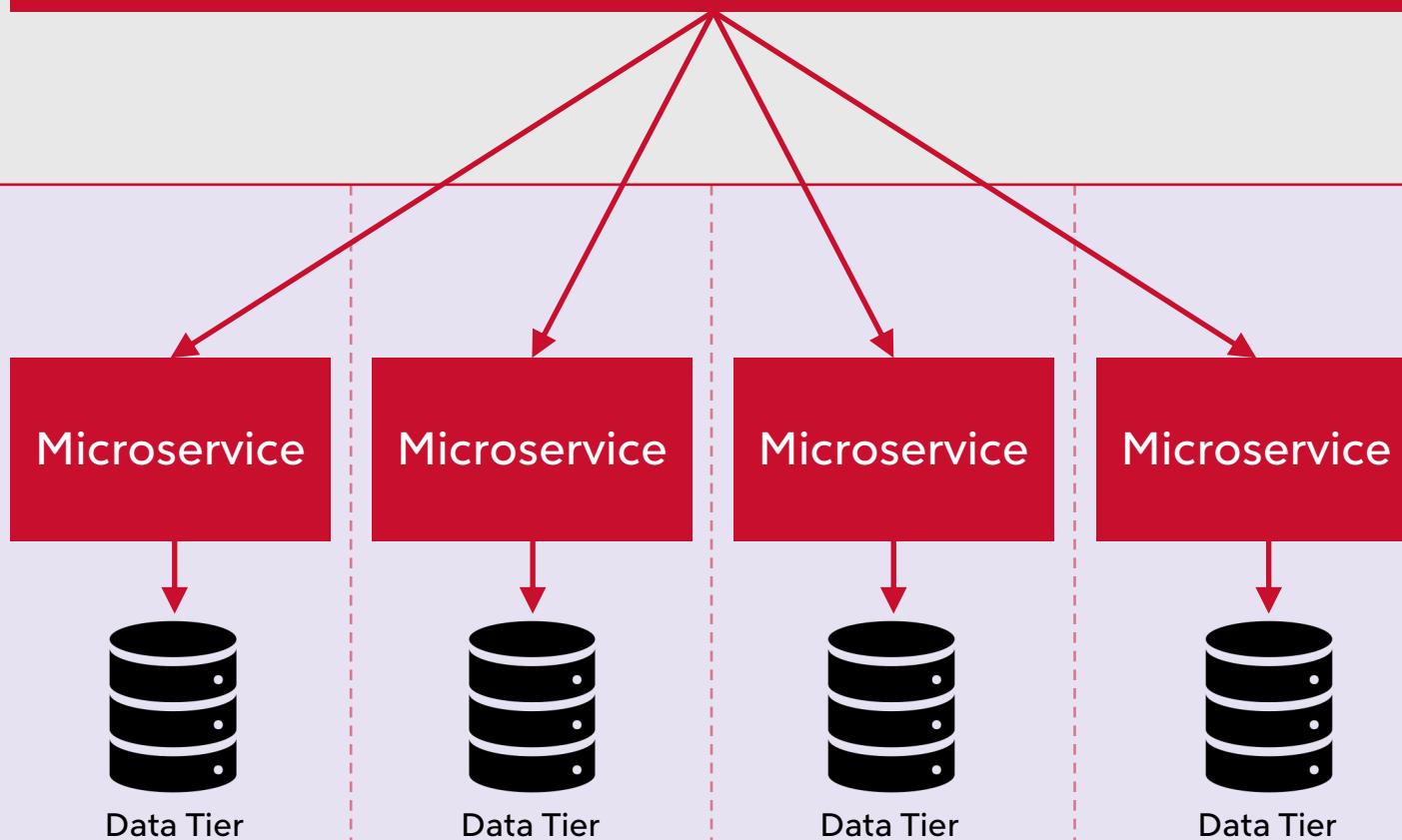
MICROSERVICES

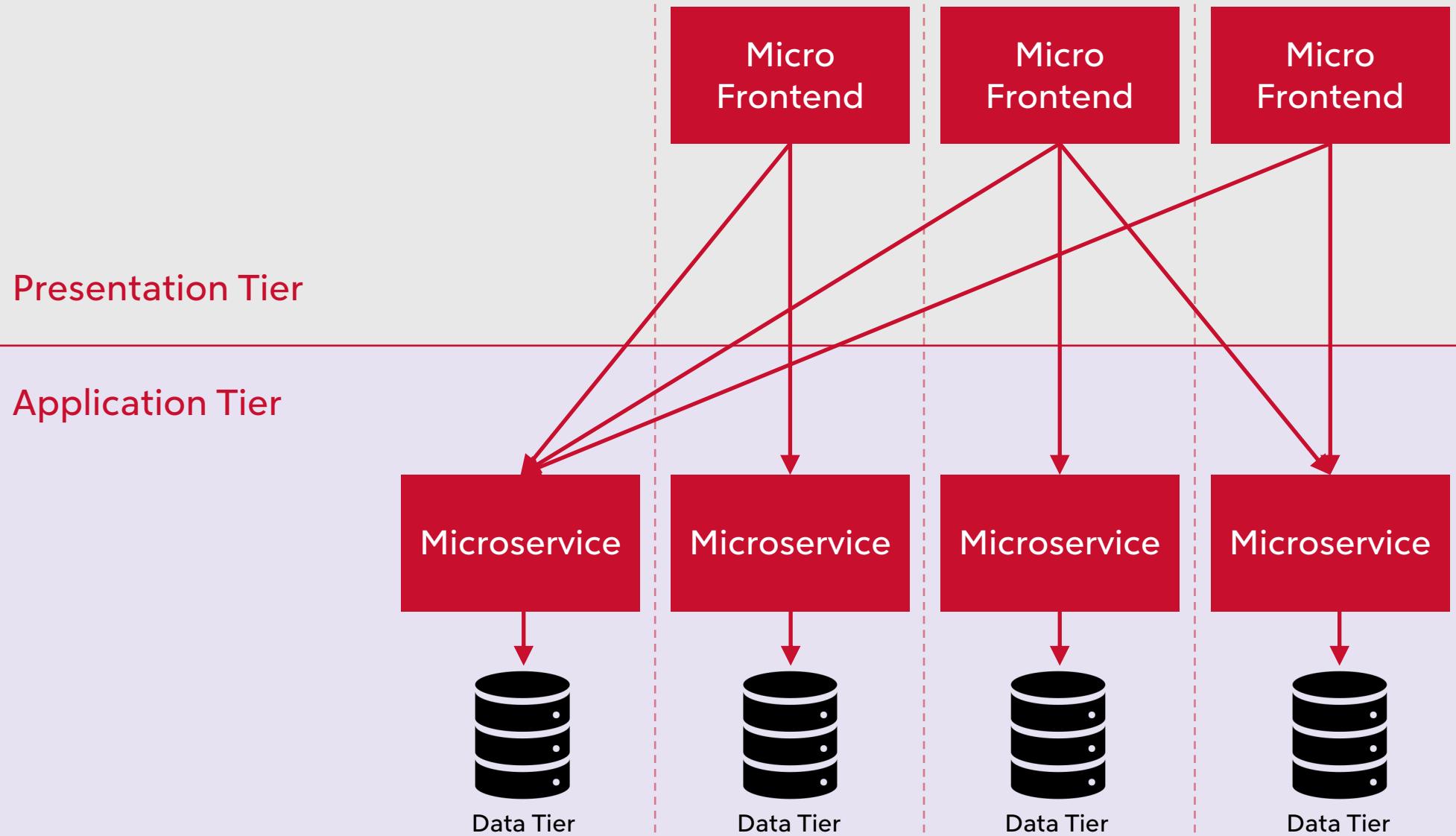
To the rescue!

Frontend

Presentation Tier

Application Tier







Micro Frontend

“

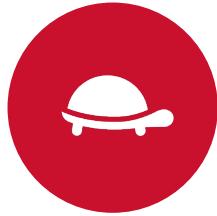
An architectural style where independently deliverable frontend applications are composed into a greater whole.

”

Terminology



Container



Shell



Component



Fragment

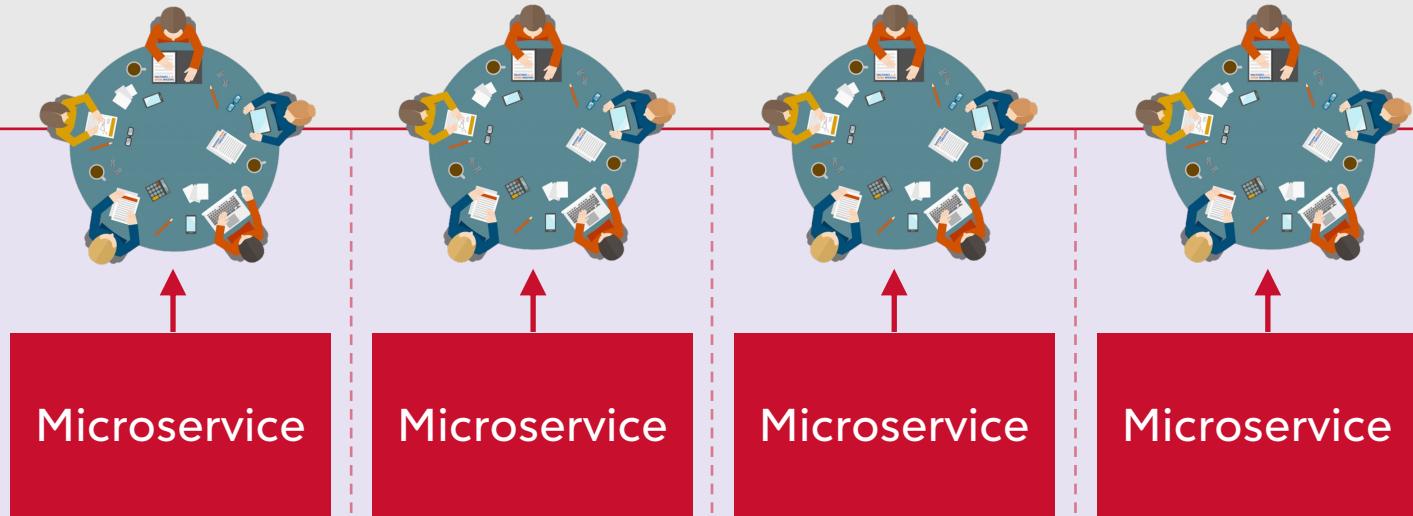
Key Benefits





Presentation Tier

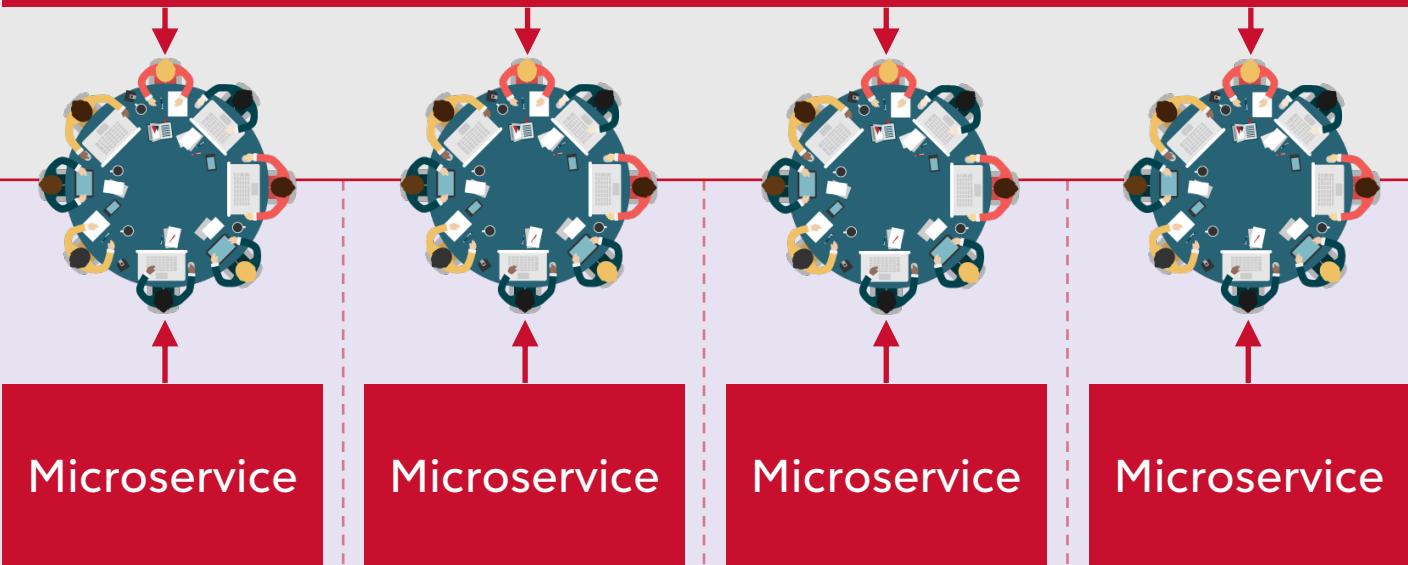
Application Tier

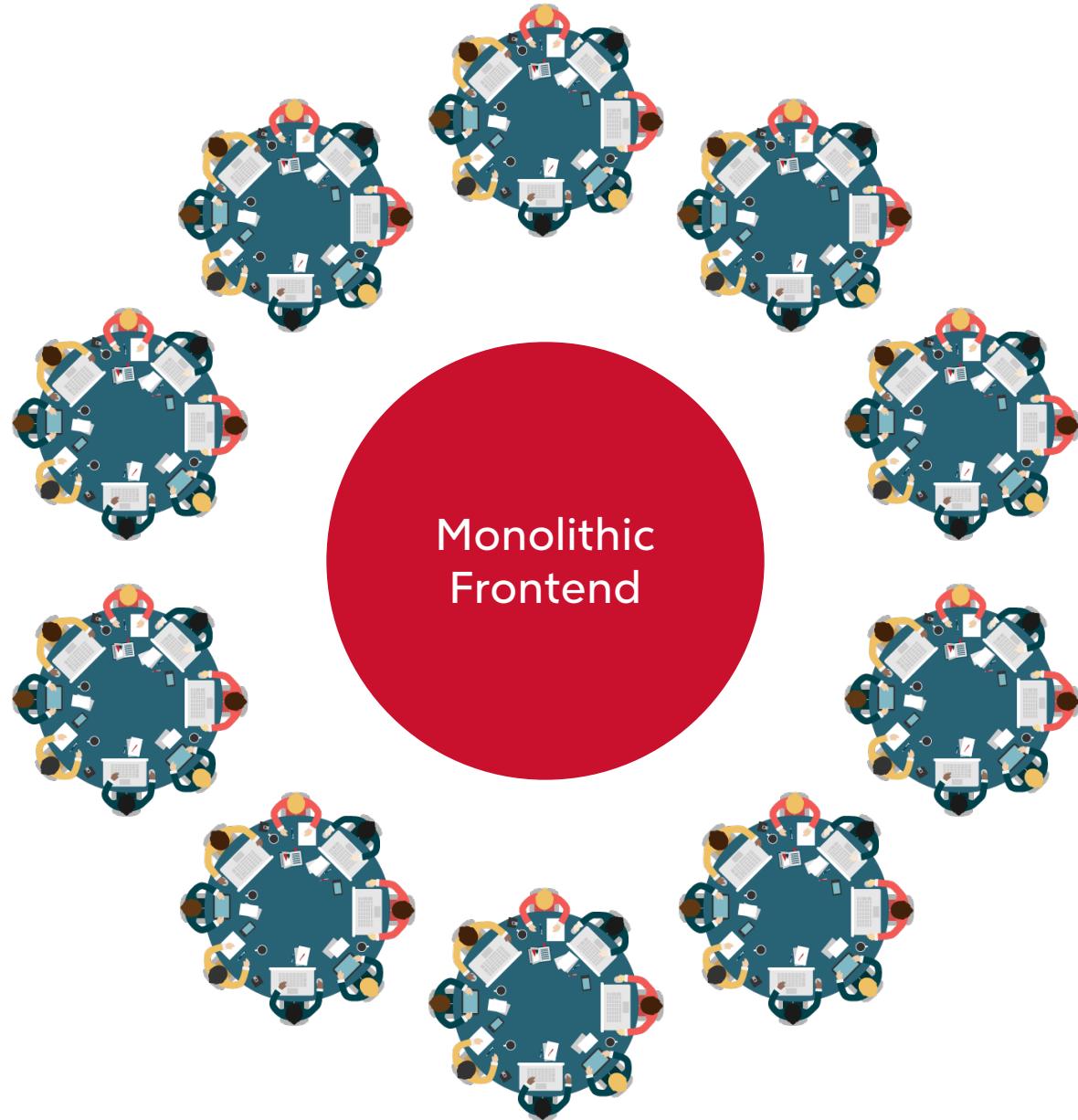


Frontend

Presentation Tier

Application Tier



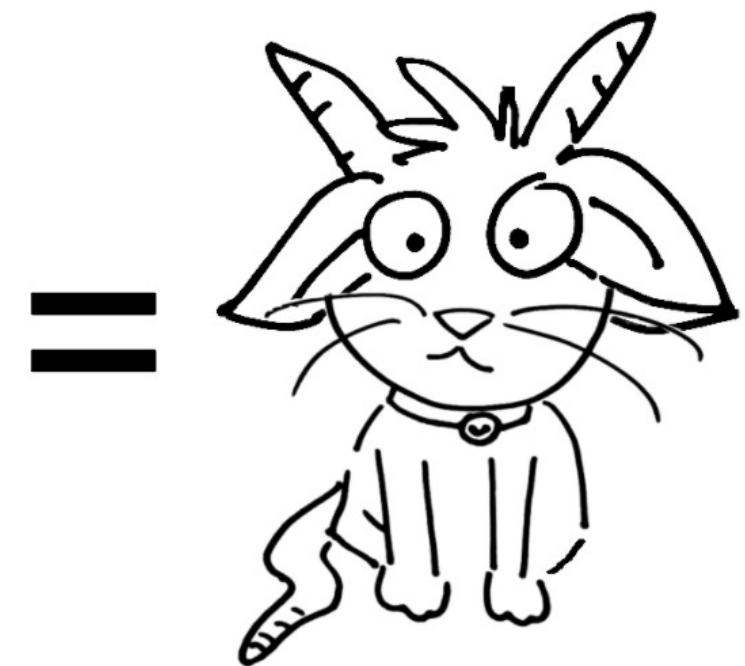


Edit Conflict: Favourite Animal

Your version

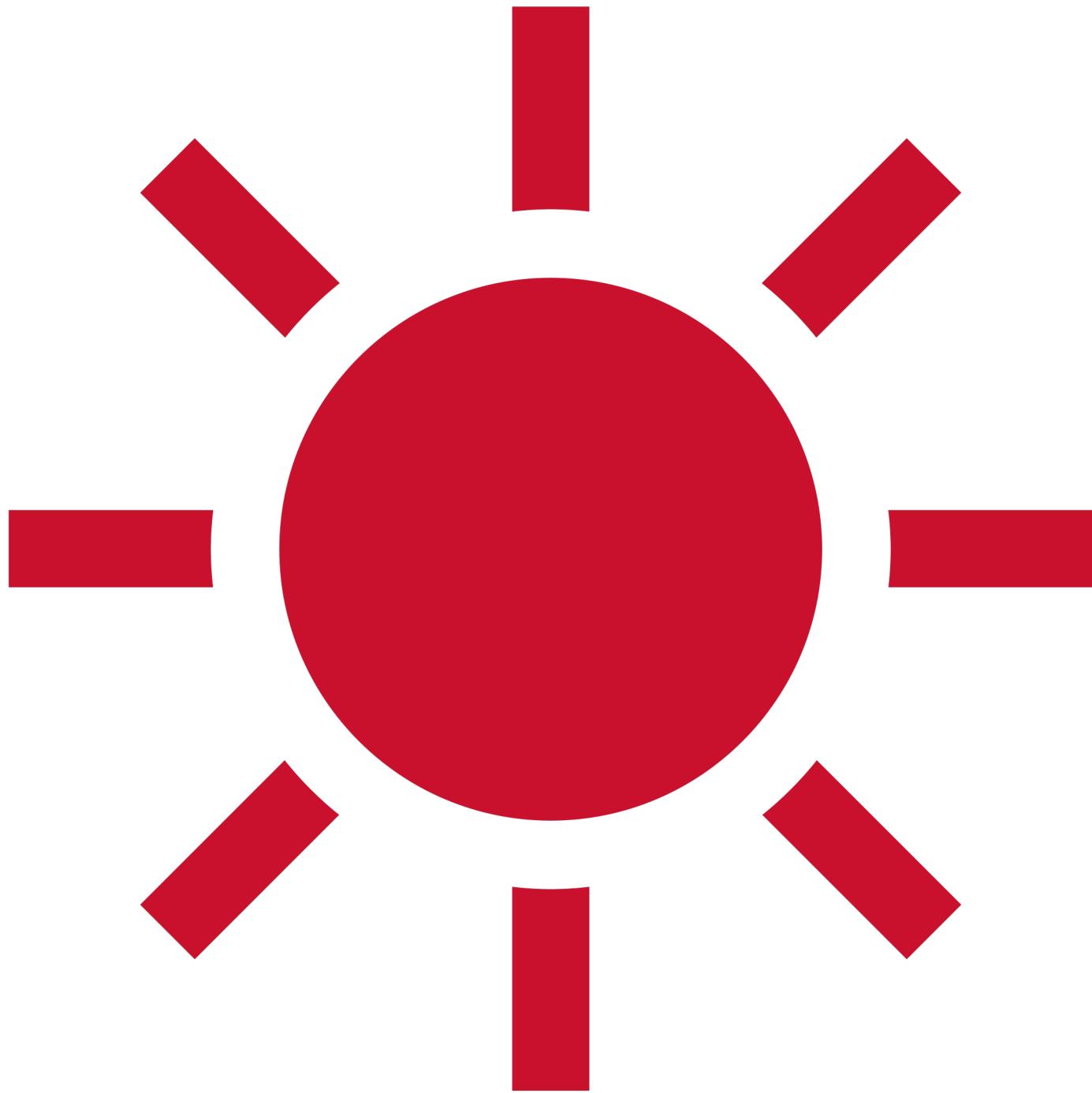


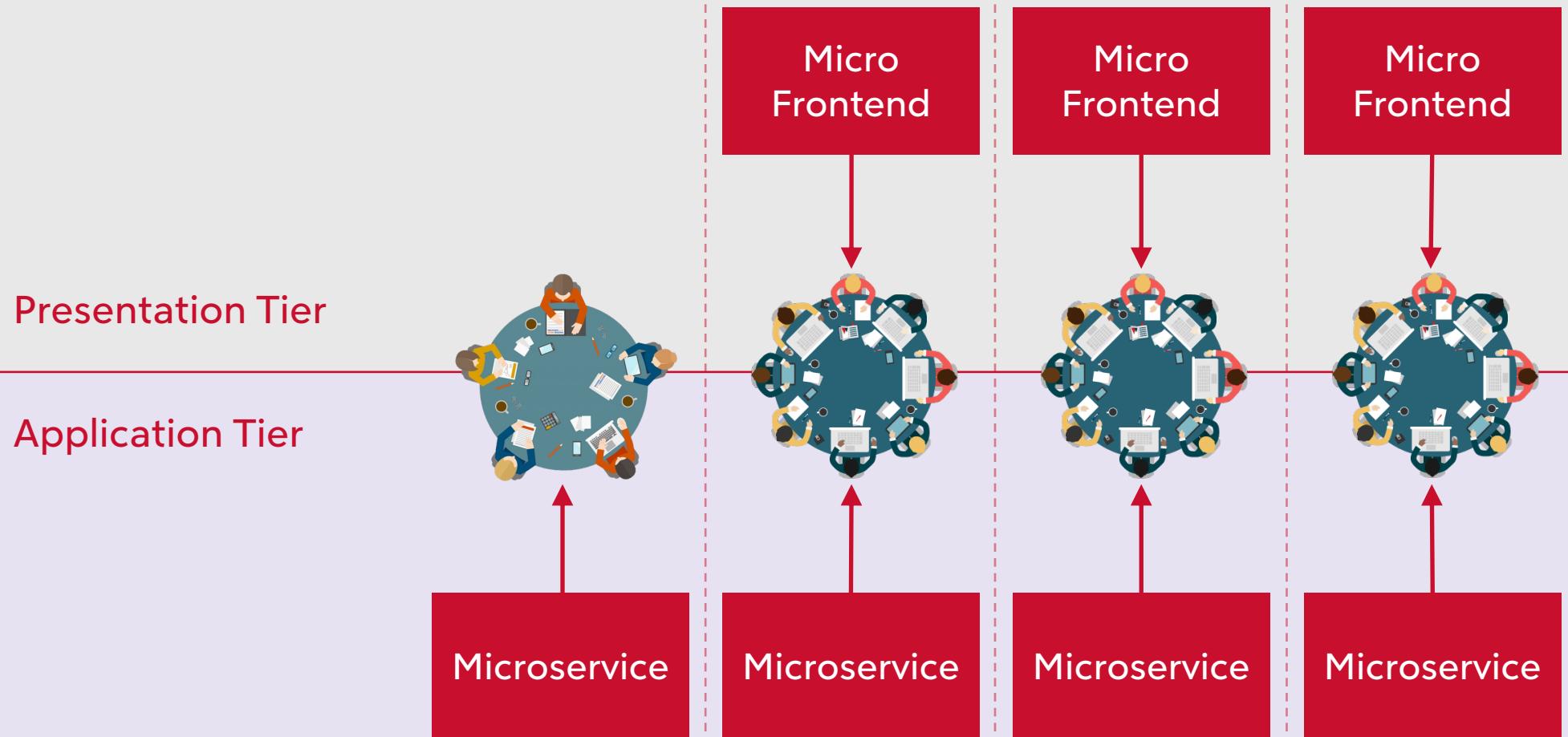
Cat Lover's version













Frontend

Same framework/version for everyone

Monolith

Micro Frontend

Micro
Frontend

Angular 9

Micro
Frontend

Angular 11

Micro
Frontend

Angular 9

Micro
Frontend

Angular 10

Frontend

Same framework/version for everyone

Monolith

Micro Frontend

Micro
Frontend

Angular

Micro
Frontend

React

Micro
Frontend

Vue.js

Micro
Frontend

LitElement

Monolith

Micro Frontend

Feature A

Legacy Code

Feature C

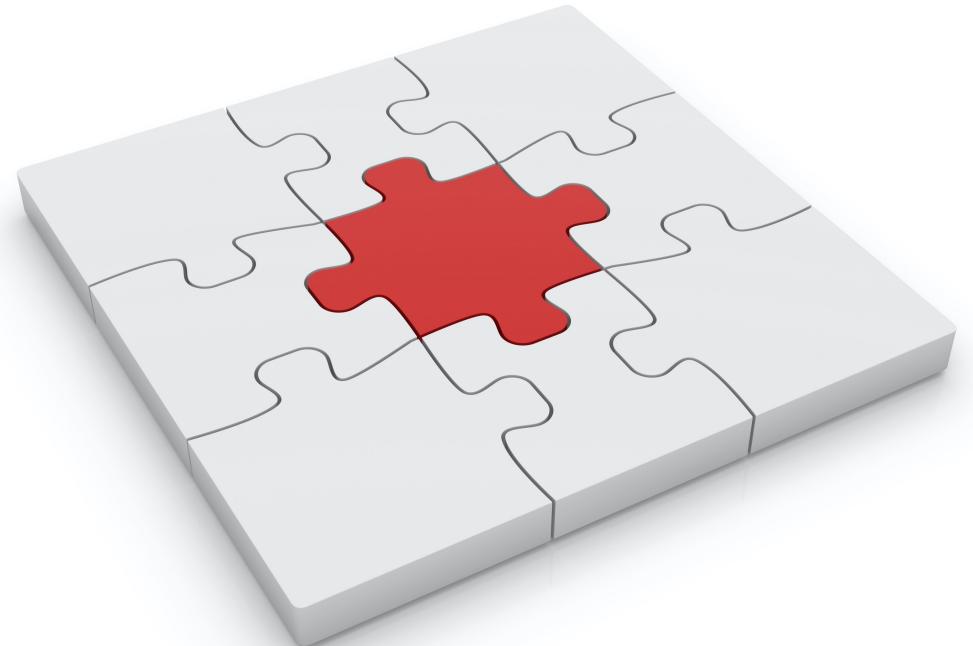
Legacy Code

Feature B

Modern Code



Integration Options



Server Side Includes

```
<html>
  <body>
    <!--#include virtual="micro-frontend-1/index.html" -->
    <!--#include virtual="micro-frontend-2/index.html" -->
    <!--#include virtual="micro-frontend-3/index.html" -->
  </body>
</html>
```



iFrames

```
<html>
  <body>
    <iframe src="https://micro-frontend-1.com">
    <iframe src="https://micro-frontend-1.com">
    <iframe src="https://micro-frontend-1.com">
  </body>
</html>
```



Microsites

Microsite 1

Microsite 2

Microsite 3



Libraries

```
$ npm install --save micro-frontend-1
$ npm install --save micro-frontend-2
$ npm install --save micro-frontend-3

// app.module.ts
imports: [
  MicroFrontend1Module,
  MicroFrontend2Module,
  MicroFrontend3Module,
]

// app.component.html
<lib-micro-frontend-1></lib-micro-frontend-1>
<lib-micro-frontend-2></lib-micro-frontend-2>
<lib-micro-frontend-3></lib-micro-frontend-3>
```



Global Functions

```
<html>
  <body>
    <script src="micro-frontend-1.js"></script>
    <script src="micro-frontend-2.js"></script>
    <script src="micro-frontend-3.js"></script>

    <script type="text/javascript">
      window.renderMicroFrontend1();
      window.renderMicroFrontend2();
      window.renderMicroFrontend3();
    </script>
  </body>
</html>
```



Custom Elements

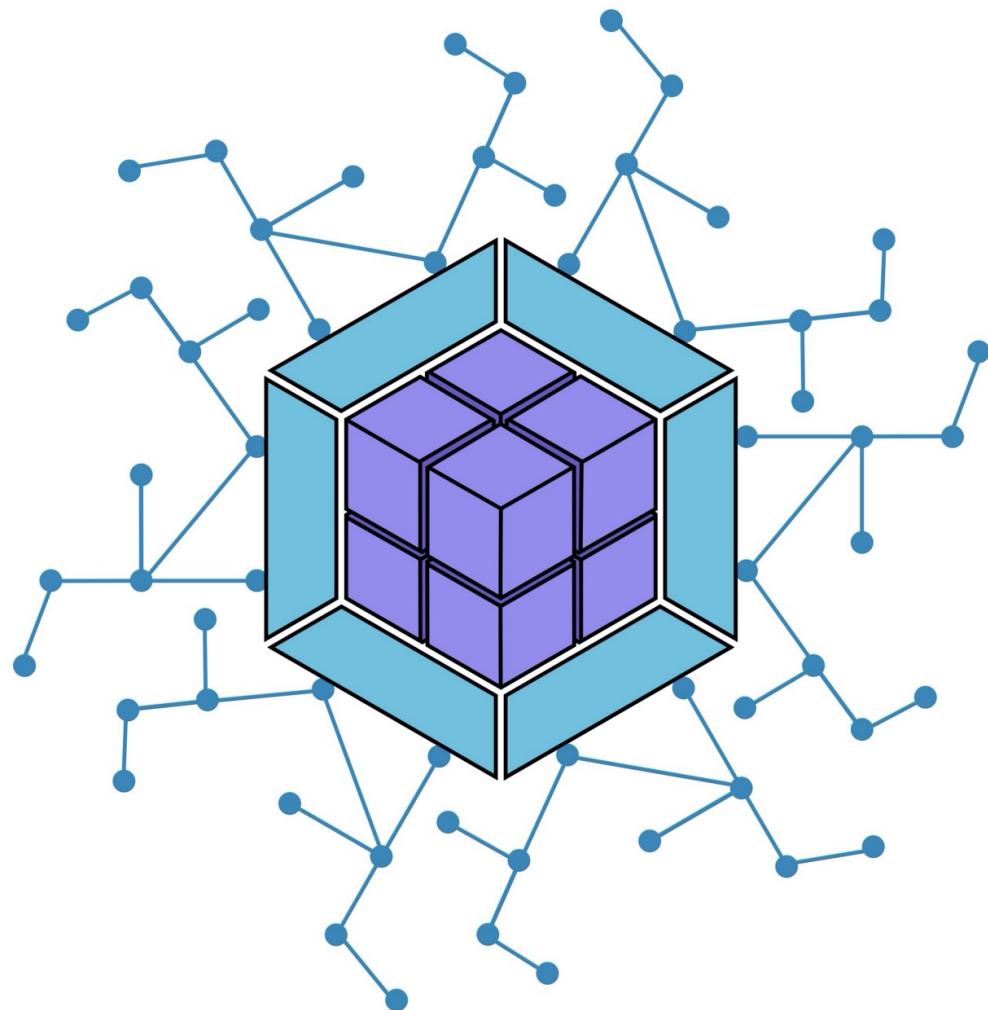
```
<html>
  <body>
    <script src="micro-frontend-1.js"></script>
    <script src="micro-frontend-2.js"></script>
    <script src="micro-frontend-3.js"></script>

    <micro-frontend-1></micro-frontend-1>
    <micro-frontend-2></micro-frontend-2>
    <micro-frontend-3></micro-frontend-3>
  </body>
</html>
```



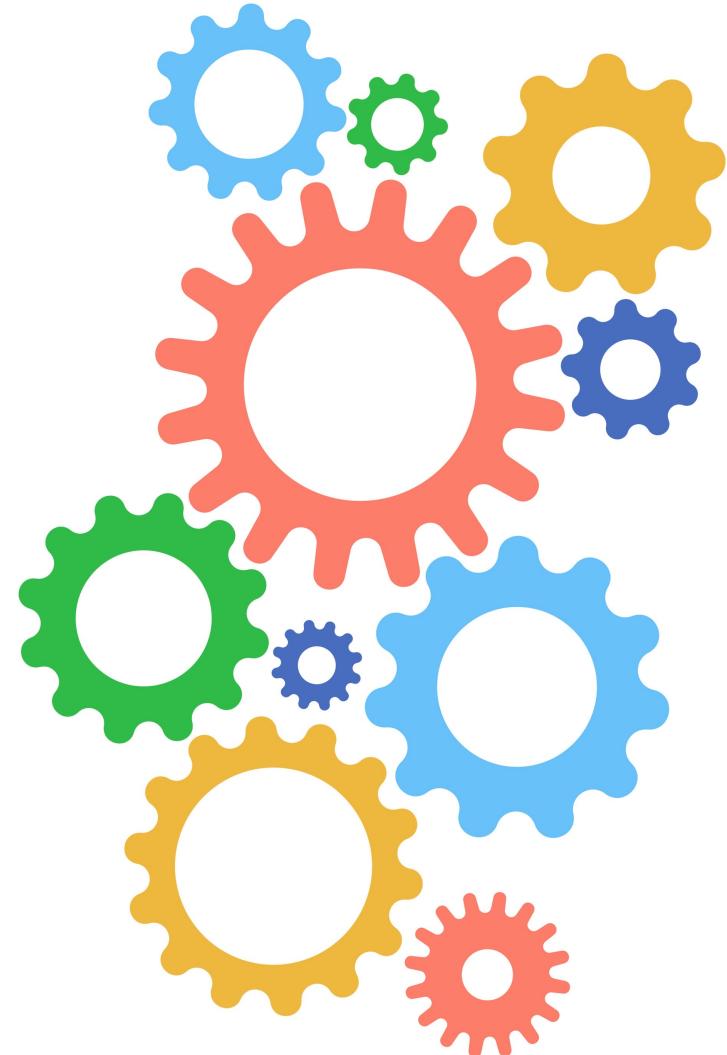
Webpack Module Federation

```
// webpack.config.js
module.exports = {
  plugins: [
    new ModuleFederationPlugin({
      remotes: {
        "micro1": "micro1@https://example.com/micro1.js",
        "micro2": "micro2@https://example.com/micro2.js",
        "micro3": "micro3@https://example.com/micro3.js"
      }
    })
  ]
};
```



Native Federation

```
// main.ts
(async () => {
  await initFederation({
    "micro1": "micro1@https://example.com/micro1.js",
    "micro2": "micro2@https://example.com/micro2.js",
    "micro3": "micro3@https://example.com/micro3.js"
  });
  await import("./app");
})();
```





single-spa



Podium



OpenComponents



Nuz



Mashroom Server



FrintJS



Scalecube



Bit



Piral



Qiankun



Luigi



Mosaic



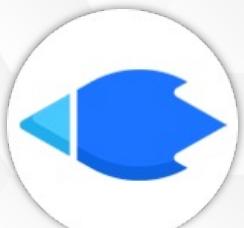
PuzzleJs



Ara



Nut Project



icestark



ILC



Misk-Web



One App



Berial

Potential Disadvantages



Browser support



CHROME



OPERA



SAFARI



FIREFOX



EDGE



HTML TEMPLATES



STABLE



STABLE



STABLE



STABLE



STABLE



CUSTOM ELEMENTS



STABLE



STABLE



STABLE



STABLE



STABLE



SHADOW DOM



STABLE



STABLE



STABLE



STABLE



STABLE



ES MODULES



STABLE



STABLE



STABLE



STABLE



STABLE

Style Bleeding

First

First

Second

Second

Third

Third



UX Cohesion

First

Lorem ipsum dolor sit amet consectetur adipisicing elit. Ullam quod nihil maxime, voluptas mollitia, perspiciatis asperiores a magnam vel iusto facere eos expedita aliquid. Consequuntur laboriosam pariatur esse enim quis!

Second

Lorem ipsum dolor sit amet consectetur adipisicing elit. Placeat accusamus eum ut enim adipisci vitae excepturi mollitia perferendis quia aperiam! Velit quae repellendus corrupti sit distinctio ea, quisquam exercitationem expedita!

Third

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First

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Second

Lorem ipsum dolor sit amet consectetur adipisicing elit. Placeat accusamus eum ut enim adipisci vitae excepturi mollitia perferendis quia aperiam! Velit quae repellendus corrupti sit distinctio ea, quisquam exercitationem expedita!

Third

Lorem ipsum dolor sit amet consectetur adipisicing elit. Debitis reprehenderit, error suscipit asperiores incidenti deleniti facilis eaque quidem molestiae sapiente iure ut blanditiis fugiat tenetur illo distinctio et molestias dolorum.

Performance

1

Bundle
Sizes

2

Duplicate
Dependencies

3

HTTP
Requests

Communication

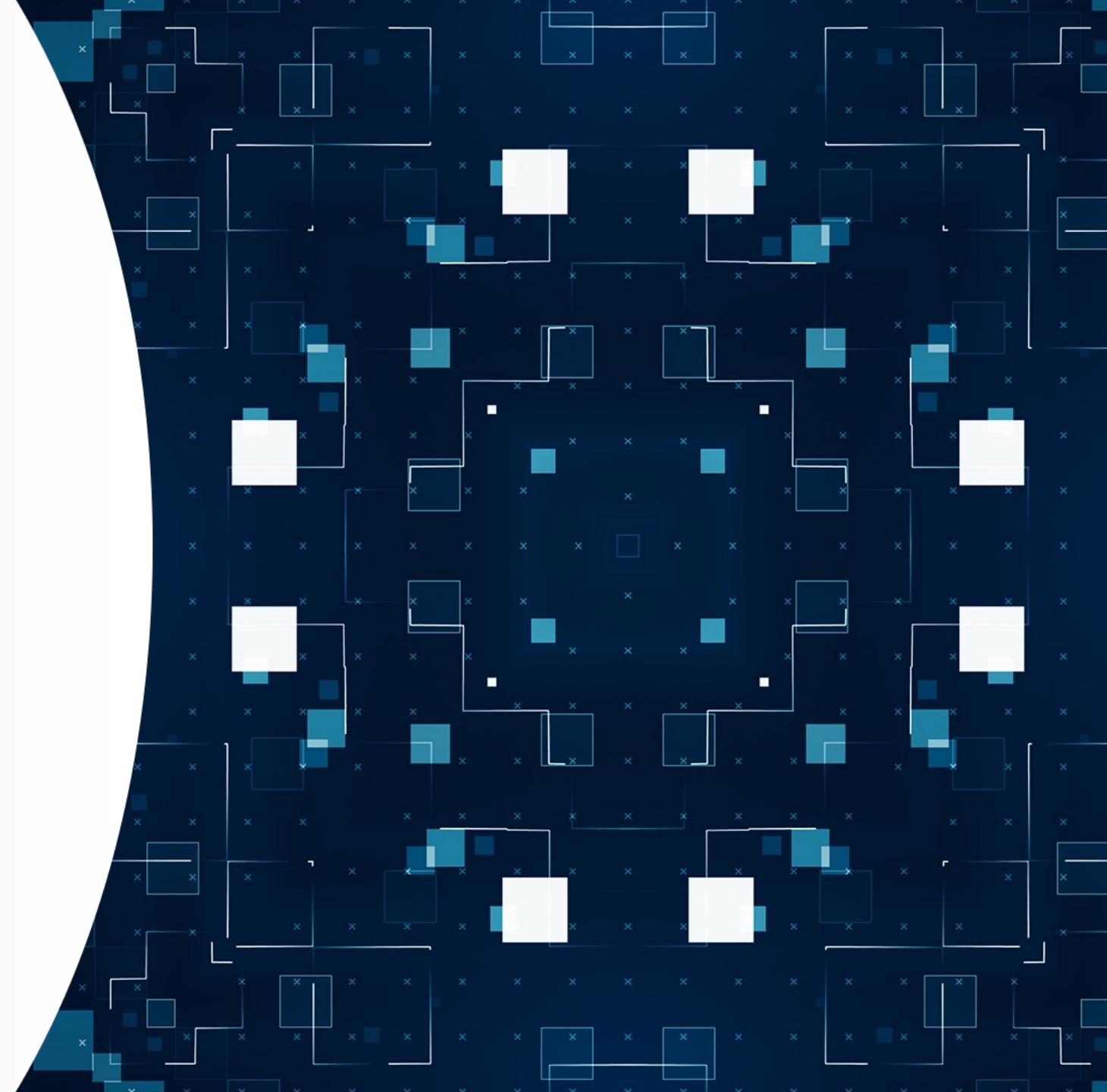


Version Mismatch

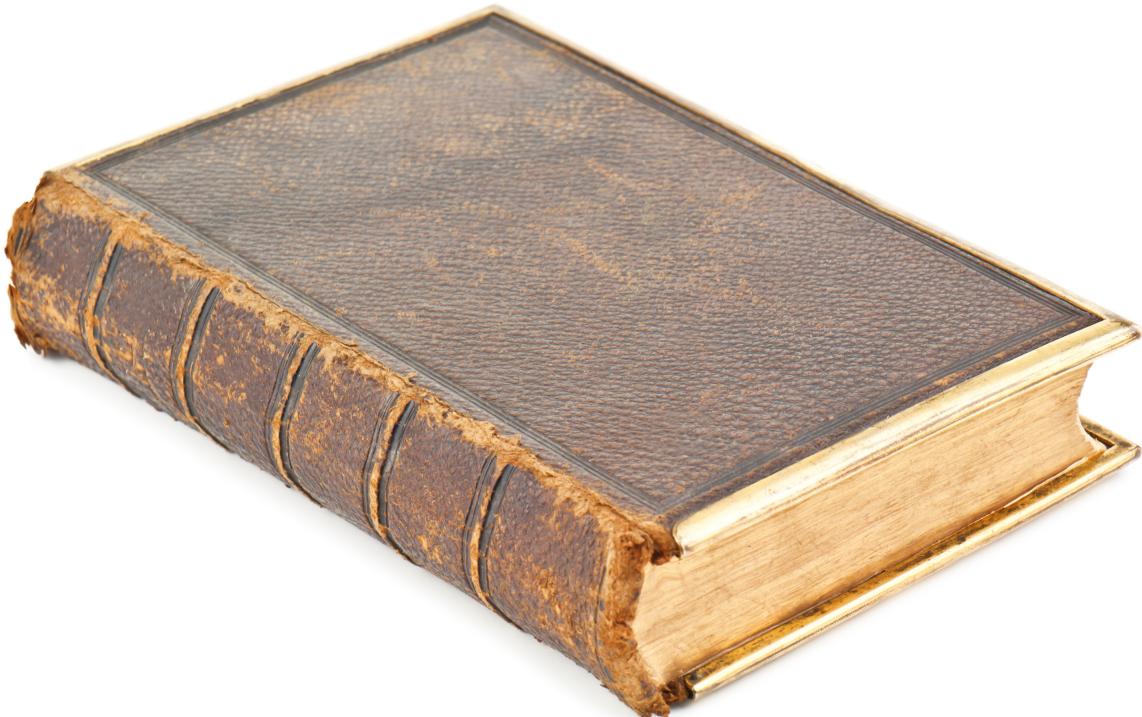


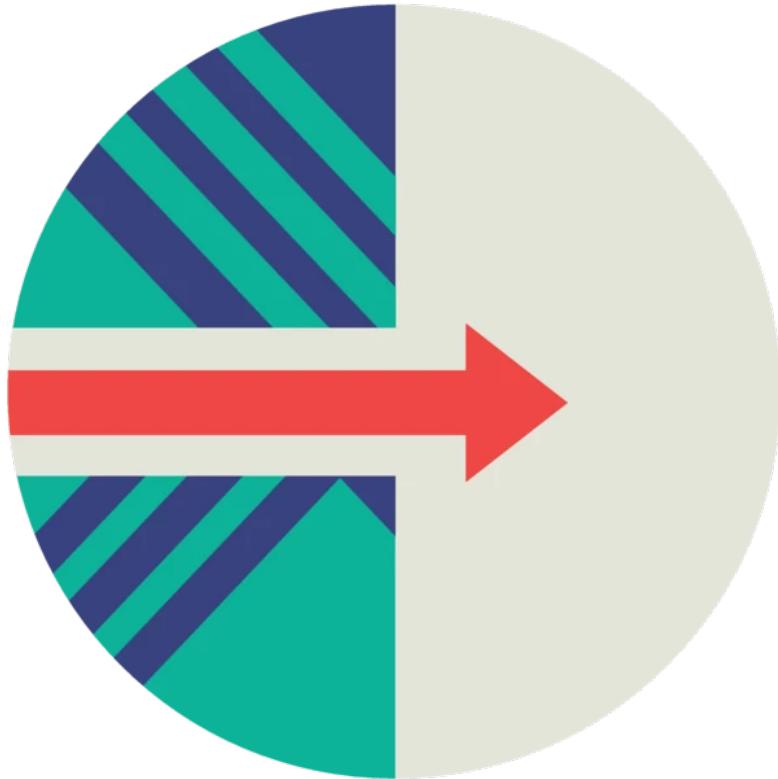
Error: Unsatisfied version 5.0.0 of shared singleton module apple (required 4.0.0)

Live Demo



Closing Thoughts

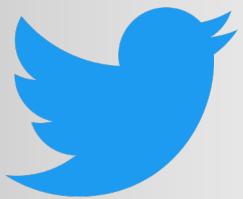




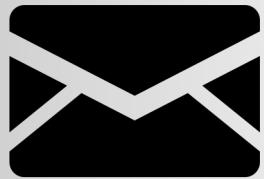
**SIMPLICITY
IS GENIUS.**



Contact Information

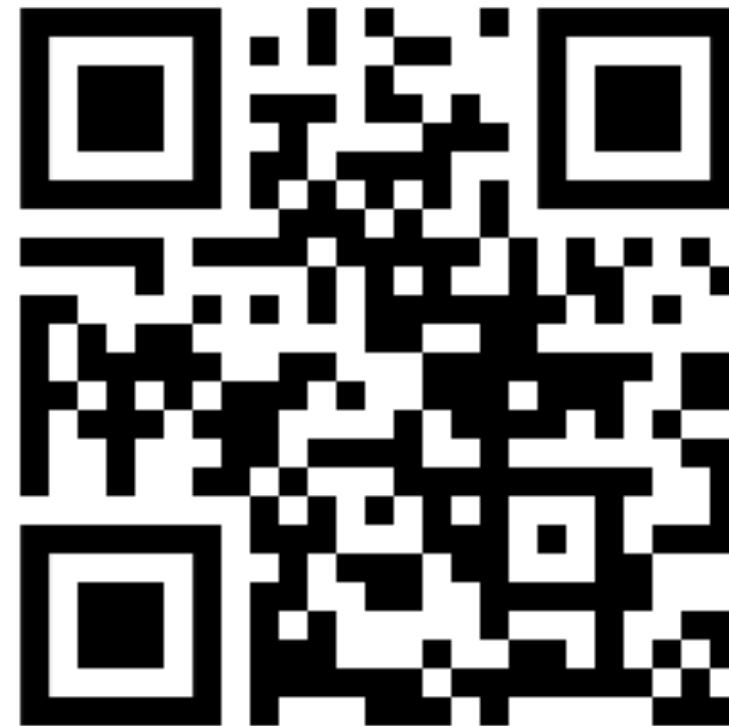


[@JasonNeal](https://twitter.com/JasonNeal)



jason@jneal.com

Slides, references, additional info:



<https://tinyurl.com/JN417>