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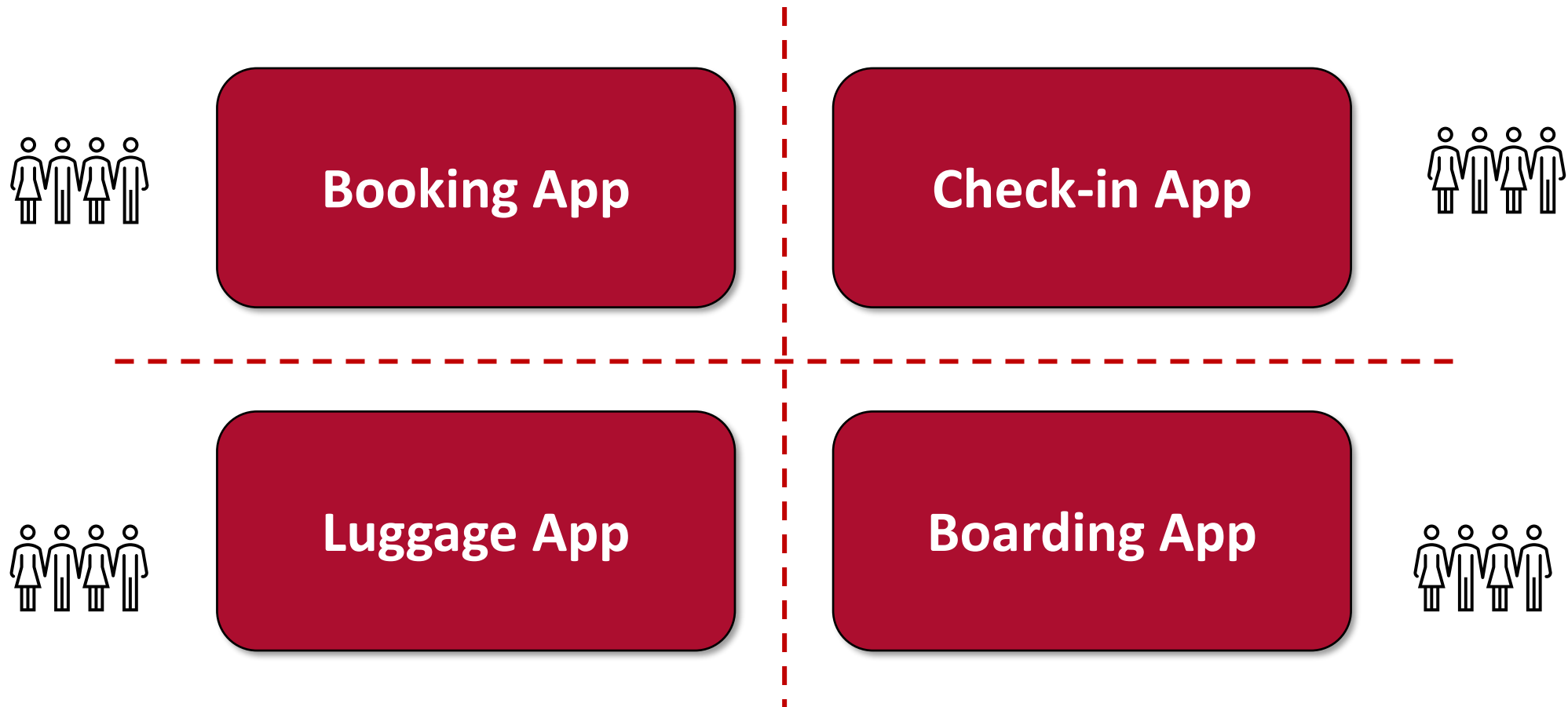


# Micro Frontends with Module Federation: Beyond the Basics

Manfred Steyer, [ANGULARarchitects.io](https://ANGULARarchitects.io)

 **ManfredSteyer**

# Micro Frontends



Micro Frontends  
are first and foremost  
about **scaling teams!**

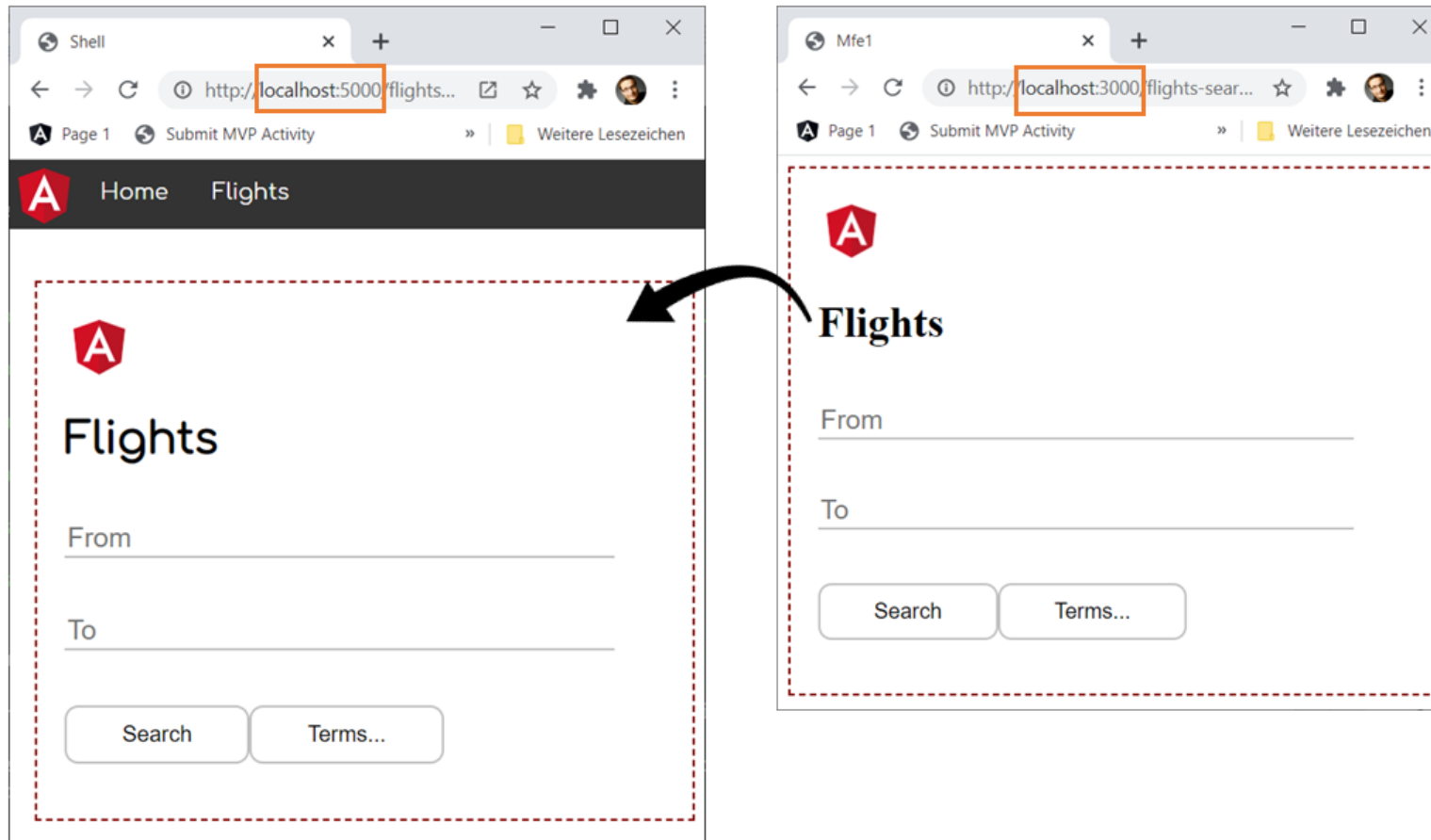


However, your Customer  
is **not interested** into  
Micro Frontends

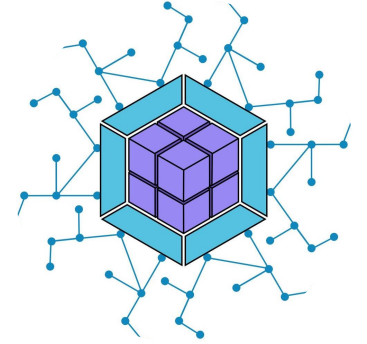


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# Runtime Integration



# Webpack 5: Module Federation



```
const Component = await import('other-app/cmp');
```

# Advanced Topics

#1  
Version  
Mismatches

#2  
Mono vs.  
Multirepo

#3  
Dynamic  
Federation

#4  
Multiple  
Frameworks/  
Versions

# Advanced Topics

#0  
Module  
Federation 101

#1  
Version  
Mismatches

#2  
Mono vs.  
Multirepo

#3  
Dynamic  
Federation

#4  
Multiple  
Frameworks/  
Versions

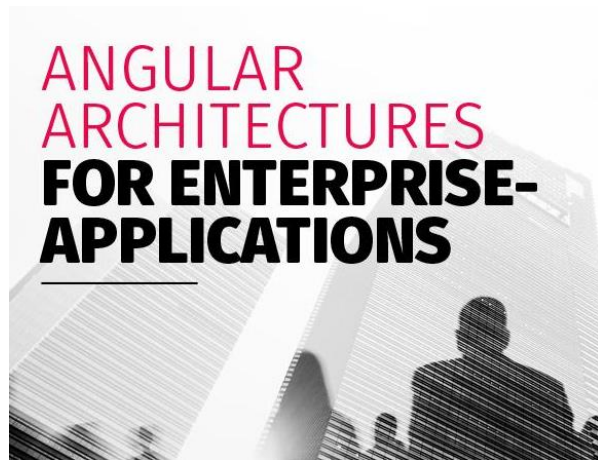




*Manfred Steyer*

# About me...

Manfred Steyer, **ANGULAR**architects.io



(Remote) Angular Workshops  
and Consulting

<http://angulararchitects.io>



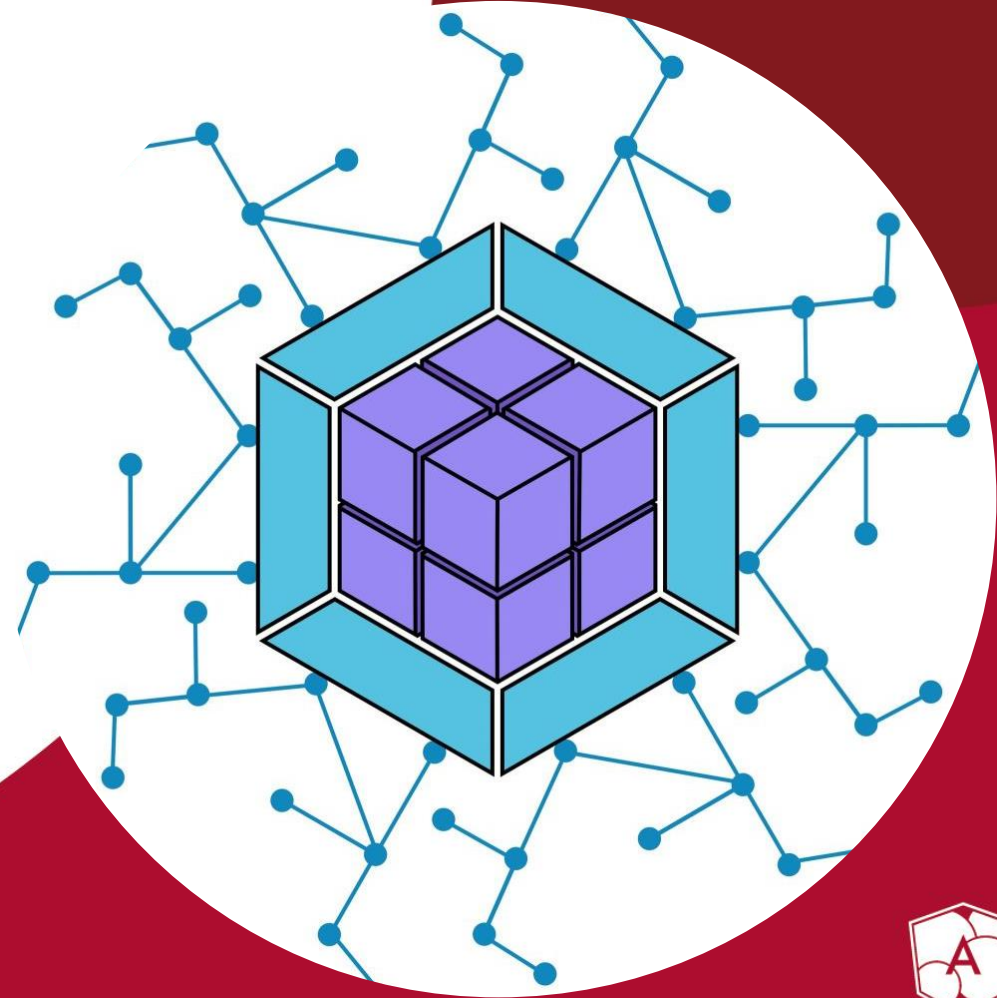
Google Developer Expert  
for Angular



Trusted Collaborator  
in the Angular Team



# #0: Module Federation 101



# Webpack 5 Module Federation

## Shell (Host)

```
import('mfe1/Cmp')
```

```
// Maps Urls in  
// webpack config
```

```
remotes: {
```

```
  mfe1: "http://..."
```

```
}
```

## Microfrontend (Remote)

```
// Expose files in  
// webpack config
```

```
exposes: {
```

```
  './Cmp': './my.cmp.ts'
```

```
}
```

# How to Share Libs?

## Shell (Host)

```
shared: [  
  "@angular/core", "..."  
]
```

## Microfrontend (Remote)

```
shared: [  
  "@angular/core", "..."  
]
```

# Using With the Angular CLI

- 1) `ng add @angular-architects/module-federation`
- 2) Adjust generated configuration
- 3) `ng serve`

# DEMO



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# #1: Version Mismatches



# Default Behavior

Selecting the highest compatible version

~~10.0~~

10.1





# Default Behavior

Conflict: No highest compatible version

11.0 ✓

10.1 ✓

# Configuring Singletons

```
shared: {  
  "my-lib": {  
    singleton: true  
  }  
}
```

11.0 ✓

~~10.1~~

# Configuring Singletons

```
shared: {  
  "my-lib": {  
    singleton: true,  
    strictVersion: true // Error instead of warning!  
  }  
}
```

11.0 ✓

~~10.1~~

# Relaxing Version Requirements

```
shared: {  
  "my-lib": {  
    requiredVersion: ">=1.0.1 <11.1.1"  
  }  
}
```

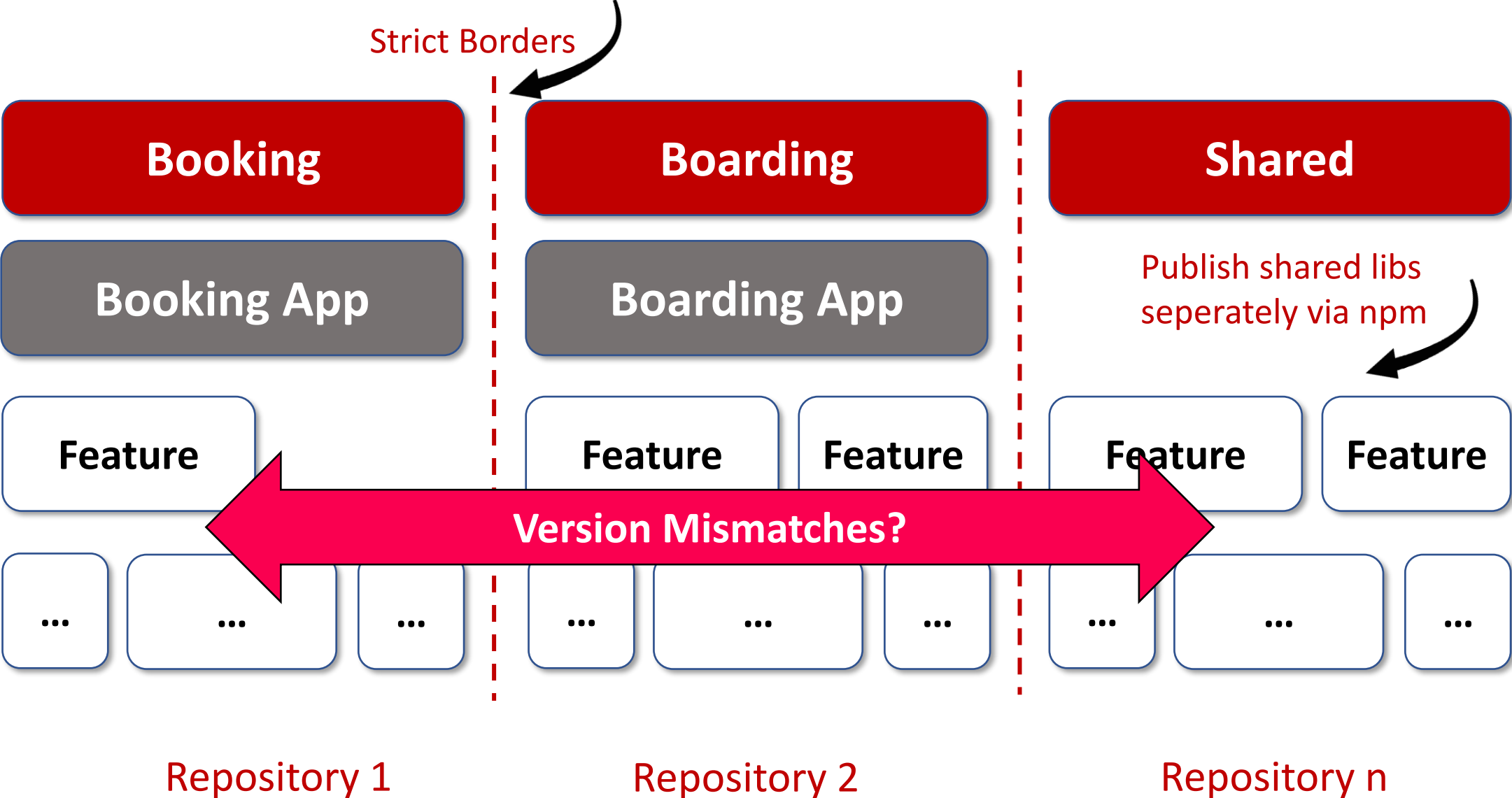
# Recap

- Several options baked-in
- However, best option: avoid conflicts upfront

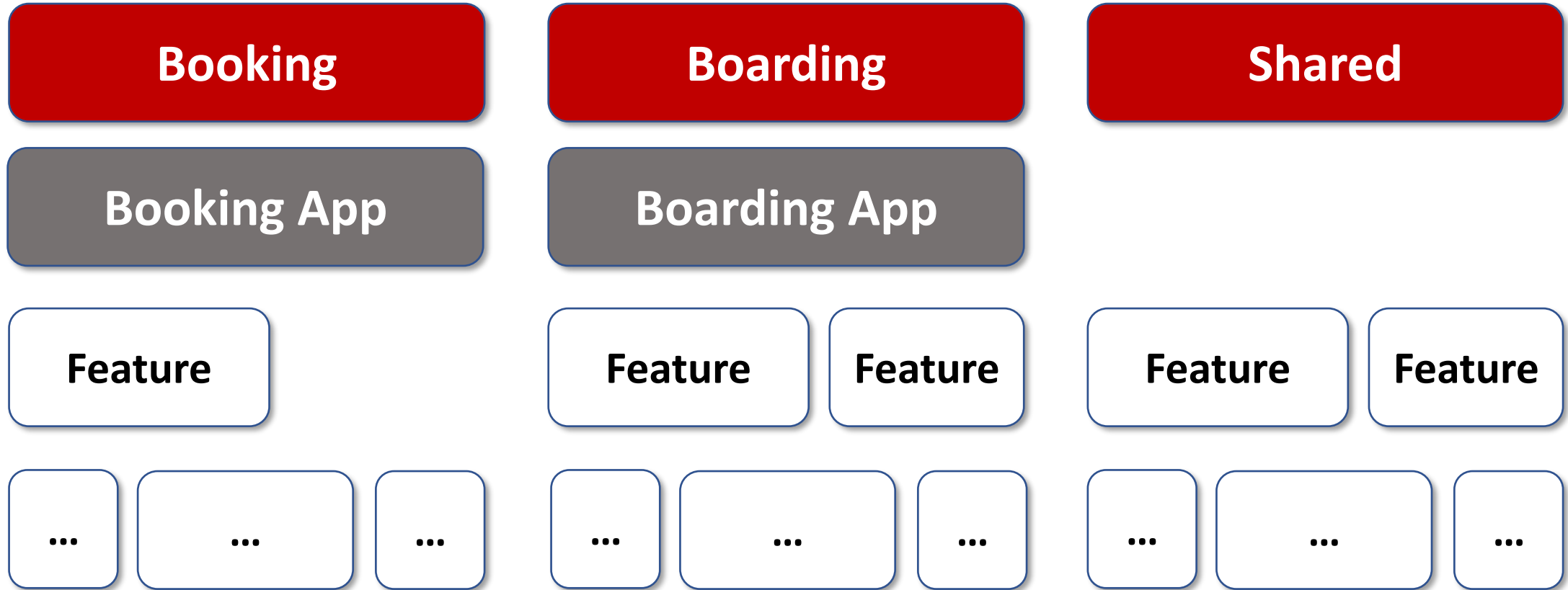
# #2: Mono vs. Multirepo?



# Micro Frontends in Multiple Repos



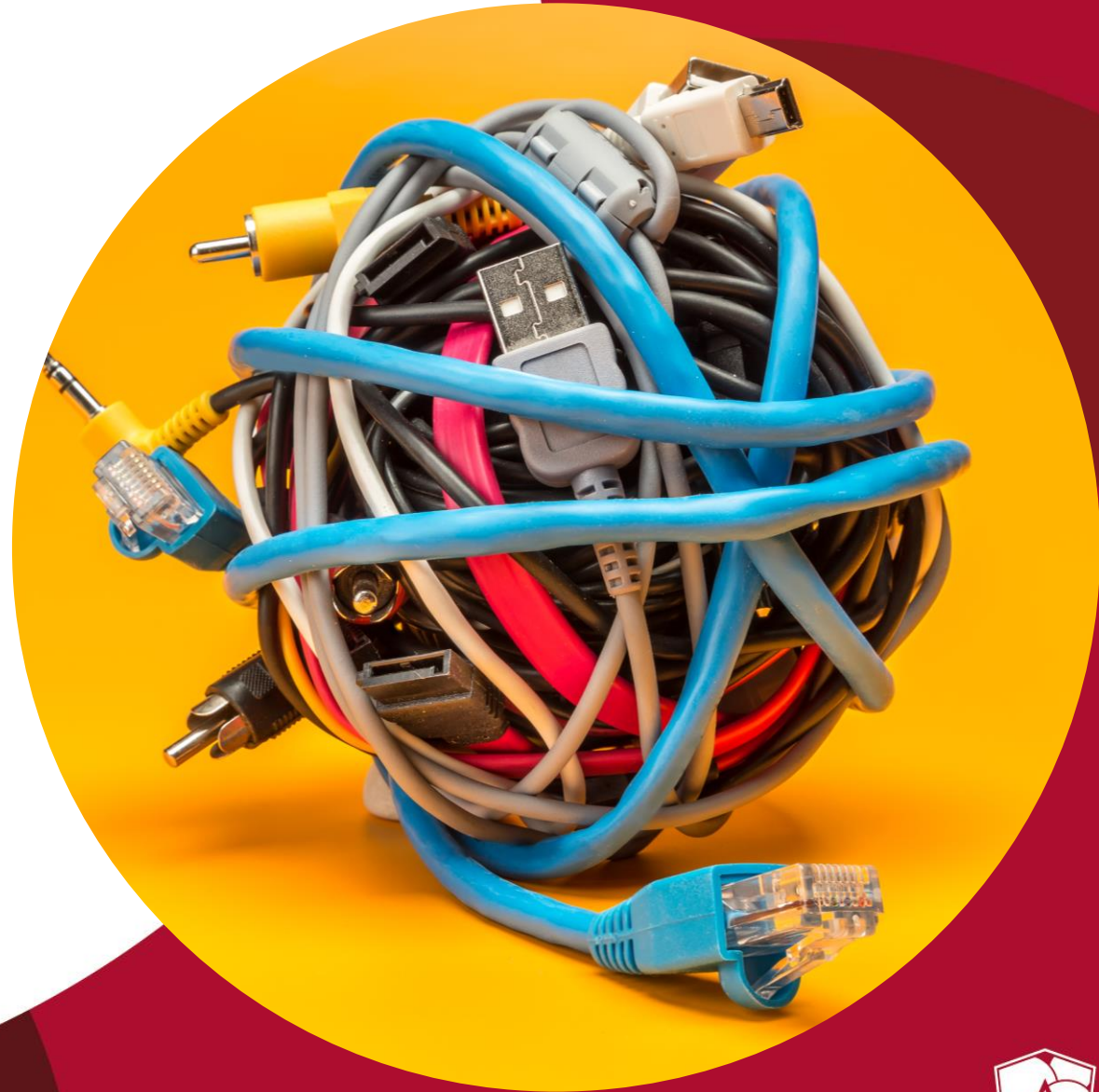
# Monorepo: One-Version-Policy



Monorepo



# How to Avoid Coupling?



# Linting: Module Boundaries in Nx

TS boarding-feature-manage.module.ts ✕

```
1 import { NgModule } from '@angular/core';
2
3 A project tagged with "domain:boarding" can only depend on
4 libs tagged with "domain:boarding", "shared" (nx-enforce-
5 module-boundaries) tslint(1)
6 Peek Problem Quick Fix...
7 import { BookingDomainModule } from '@ddd-demo/booking/domain';
```

<https://nrwl.io/nx>



# Nrwl Extensions for Angular

An open source toolkit for enterprise Angular applications.

# #3: Dynamic Module Federation



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# Dynamic Module Federation

## Shell (Host)

```
import('mfe1/Cmp')
```

```
remotes: {  
  mfe1: "http://..."  
}
```

## Microfrontend (Remote)

```
exposes: {  
  Cmp: './my.cmp.ts'  
}
```

# Dynamic Module Federation

## Shell (Host)

```
import('mfe1/Cmp')
```

```
remotes: {  
}
```

## Microfrontend (Remote)

```
exposes: {  
  Cmp: './my.cmp.ts'  
}
```

# Dynamic Module Federation

## Shell (Host)

```
loadRemoteModule({  
  type: 'module',  
  remoteEntry: 'http://...',  
  exposedModule: './Cmp'  
})  
  
remotes: {  
}
```

## Microfrontend (Remote)

```
exposes: {  
  Cmp: './my.cmp.ts'  
}
```

# Dynamic Module Federation

Helper Function using  
the Webpack API



```
loadRemoteModule({  
  type: 'module',  
  remoteEntry: 'http://...',  
  exposedModule: './Cmp'  
})  
  
remotes: {  
}
```

## Microfrontend (Remote)

```
exposes: {  
  Cmp: './my.cmp.ts'  
}
```



# DEMO



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# #4: Multi Framework/ Version Solutions



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# Module Federation

```
const Component = await import('other-app/cmp');
```

# Module Federation

```
const main = await import('other-app/main');
```

```
main.bootstrap();
```

# Module Federation

```
const rootElm = document.createElement('app-root')  
document.body.appendChild(rootElm);
```

```
const main = await import('other-app/main');
```

```
main.bootstrap();
```

# Module Federation

```
const rootElm = document.createElement('app-root')  
document.body.appendChild(rootElm);
```

```
await import('other-app/main'); // Self-Bootstrapping
```

# Routing to Another SPA?

## WrapperComponent

```
const rootElm = document.createElement('app-root')
document.body.appendChild(rootElm);

await import('other-app/main');
```

# Challenges & Solutions

@angular-architects/module-federation-tools TS

12.5.3 • Public • Published 21 days ago



Readme



Explore

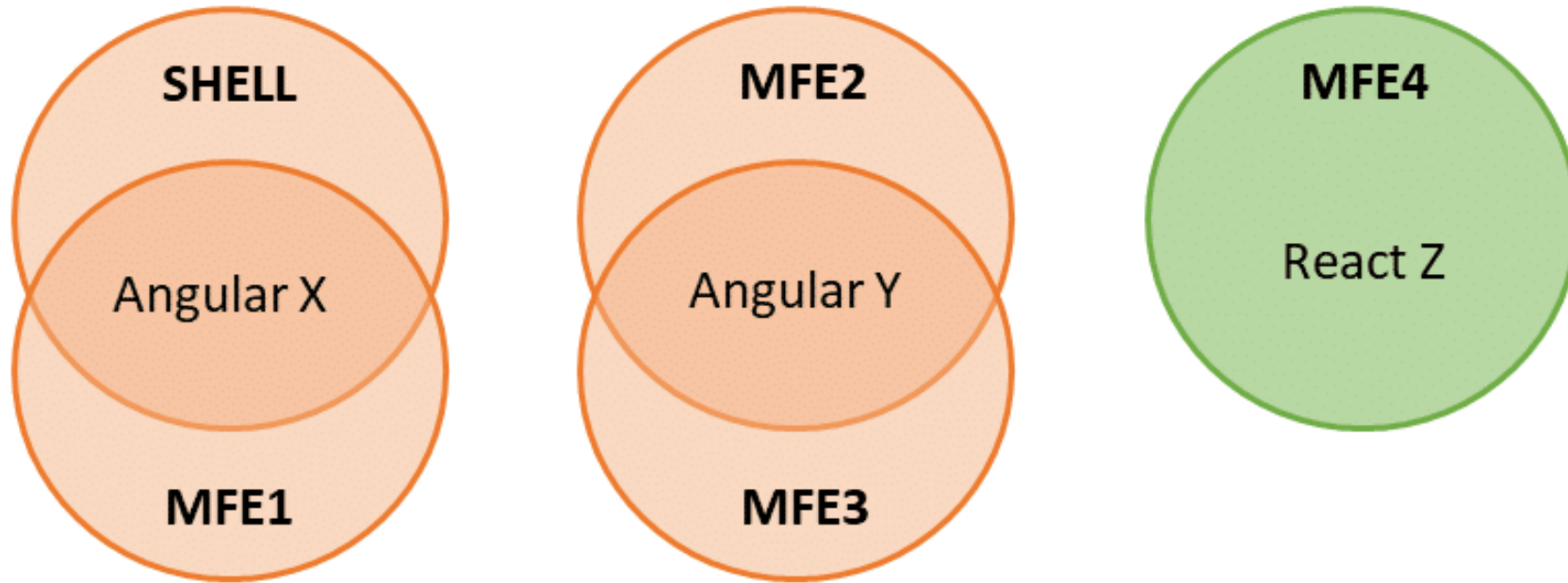
BETA



1 Dependency



# Result



# DEMO



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# DEMO

<https://red-ocean-0fe4c4610.azurestaticapps.net>

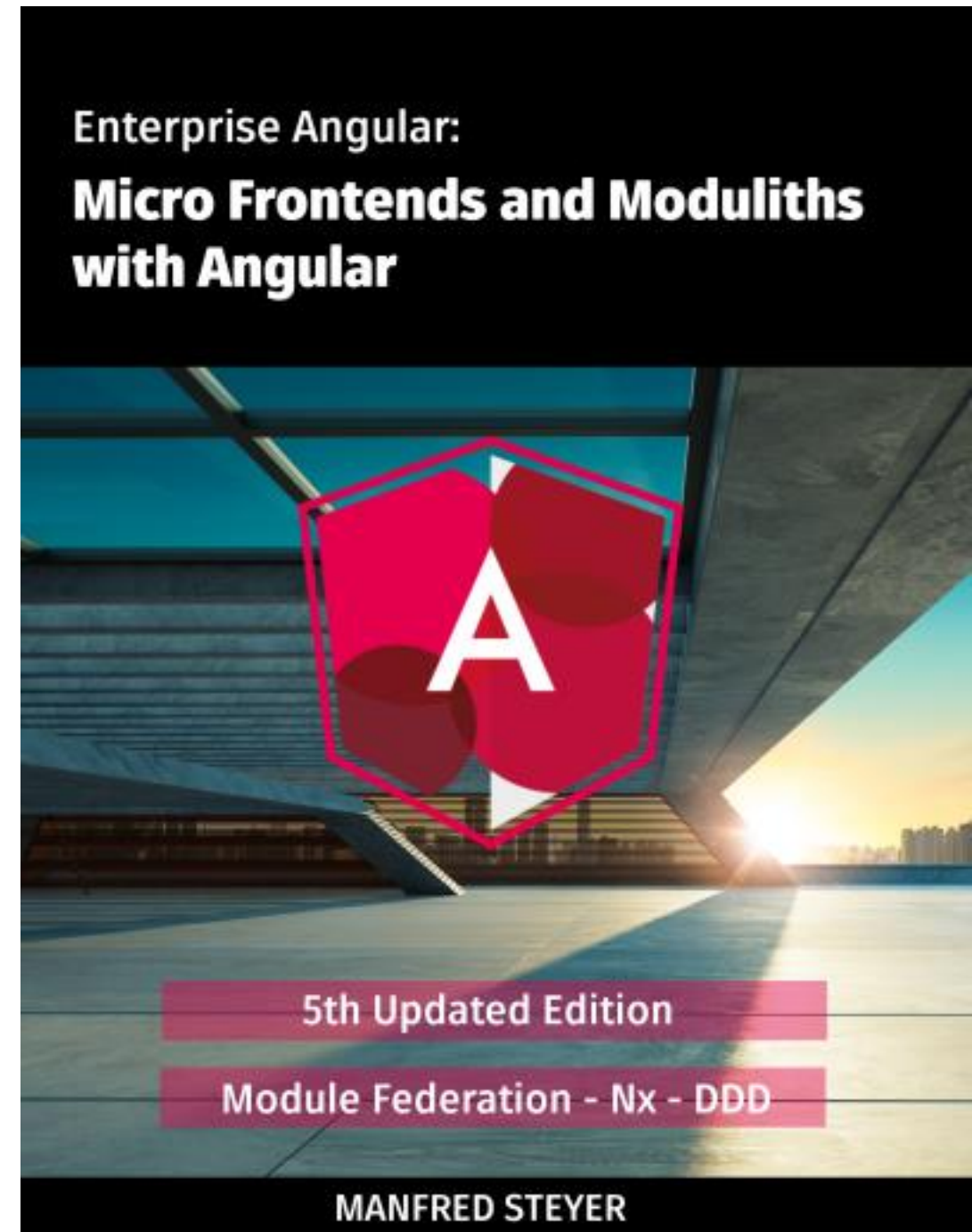


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# Free eBook (5th Edition)

Module Federation & Nx

[ANGULARarchitects.io/book](https://ANGULARarchitects.io/book)



# Conclusion

Baked-in Strategies  
for Version  
Mismatches

Monorepo vs.  
Multirepo:  
Self-restriction vs.  
(Costly) Freedom

Webpack Runtime  
API: Dynamic  
Federation

Frankenstein:  
Bootstrapping  
Several SPAs

# Contact and Downloads

[web] **ANGULAR**architects.io

[twitter] ManfredSteyer

*Slides & Examples*



Remote Company Workshops  
and Consulting

<http://angulararchitects.io>