ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

Routing Deep Dive

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Motivation

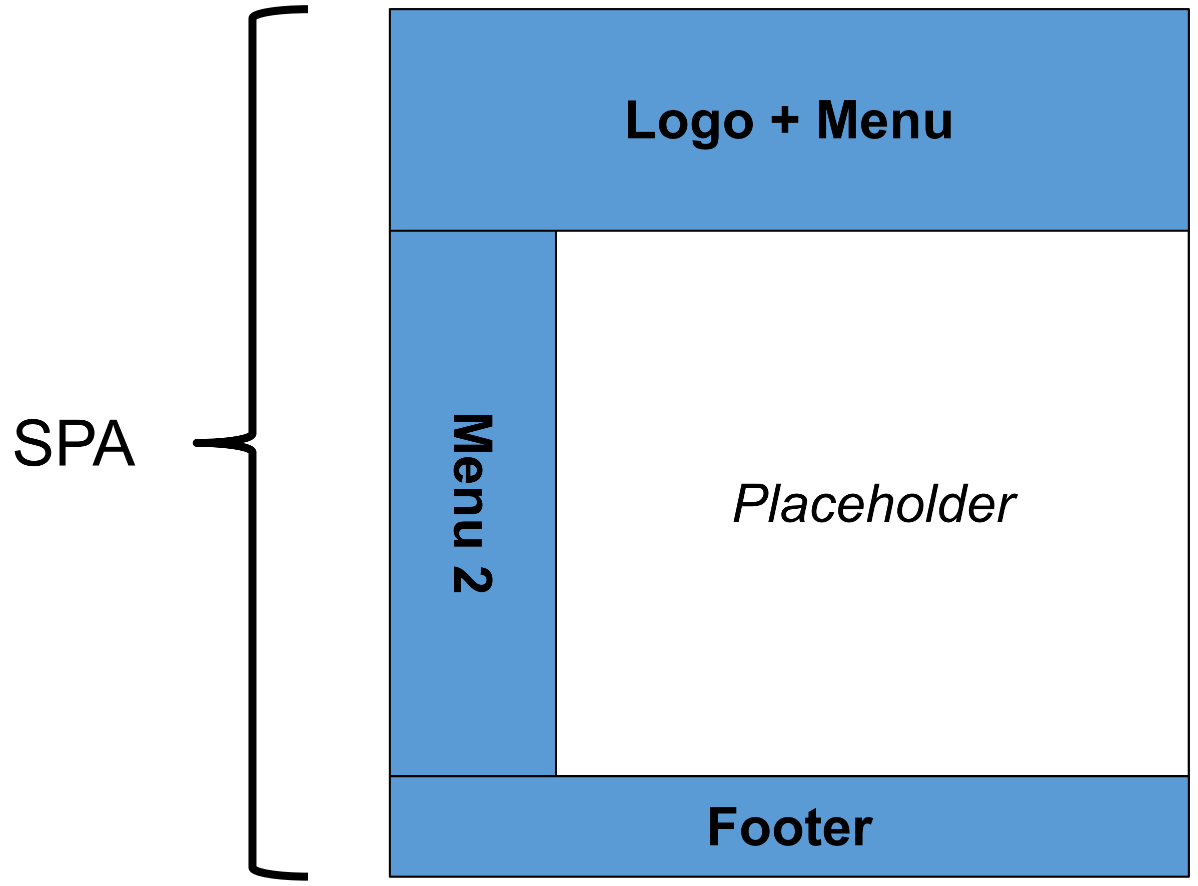
- SPAs → single page application
- Simulate pages → routes
- URL should direct to the routed component
  - Menus & bookmarks (today → Google ☺)
  - Sharing (social platforms)
  - **The Back button!**
  - **For development**

Contents

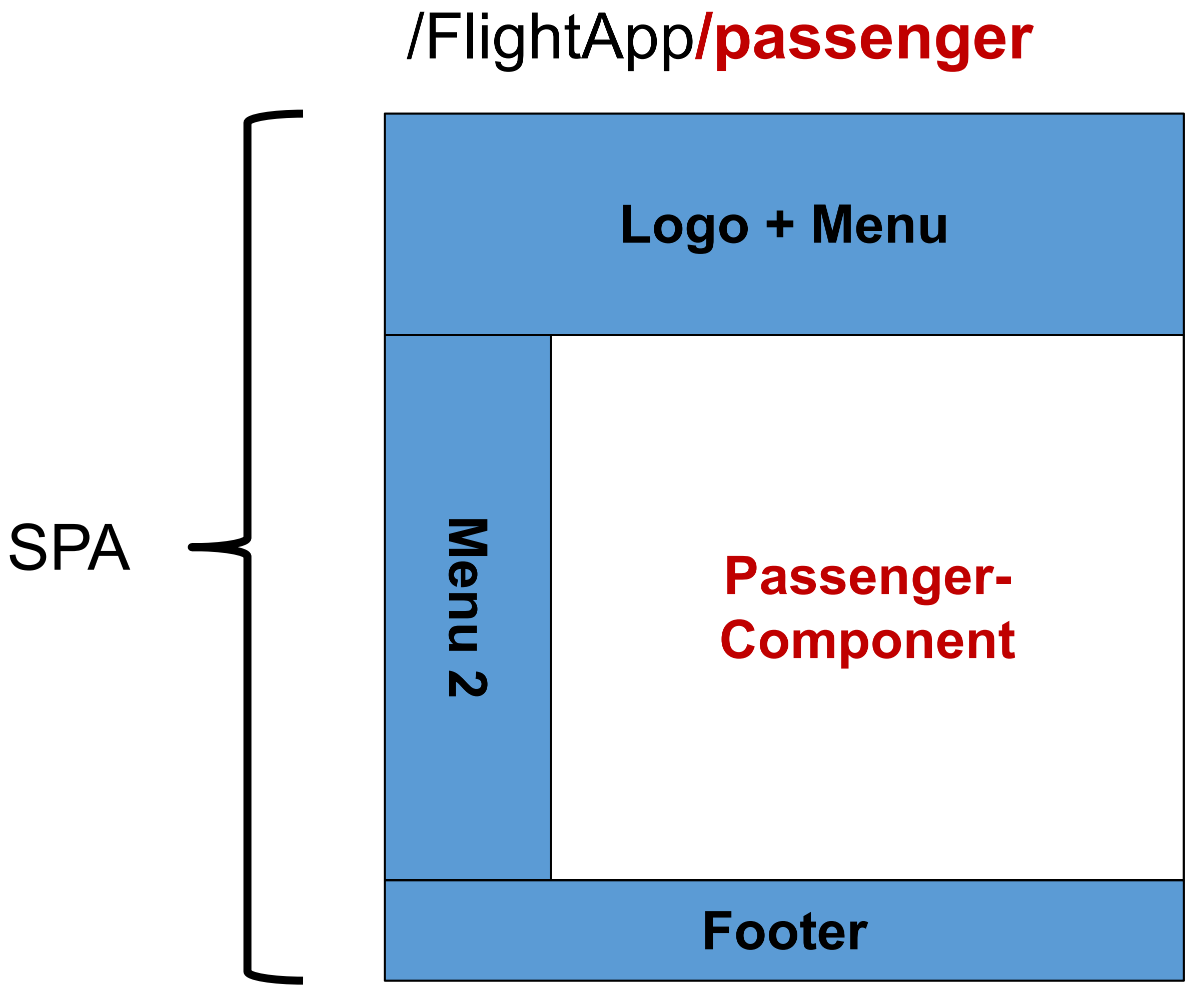
- Basics & Parameters
- Child Routes
- Aux Routes
- Guards (new as functions in NG14!)
- Resolver
- Lazy Loading

Angular Router

Routing in Angular



Routing in Angular



Configuration

```
const appRoutes: Routes = [
    {
        path: 'home',
        component: HomeComponent
    },
    {
        path: 'flight-search',
        component: FlightSearchComponent
    },
    {
        path: '**',
        redirectTo: 'home'
    }
]
```

Configuration

```
// app.module.ts
@NgModule({
    imports: [
        BrowserModule,
        HttpModule,
        FormsModule,
        RouterModule.forRoot(appRoutes)
    ],
    […]
})
export class AppModule {}
```

For Feature-Module: forChild

For Root-Module

AppComponent

```
<a routerLink="/home">Home</a>
<a [routerLink]="'/flight-search'">Flight Search</a>

<div>
    <router-outlet></router-outlet>
</div>
```

Parameters

- passenger
- passenger/7
- passenger/7/flights
- passenger/flights
- ~~passenger/7?showDetails=true~~
- passenger/7;showDetails=true
- passenger/7; showDetails =true;page=7/flights

Parameters

```
const appRoutes: Routes = [
    […]
    {
        path: 'flight-search',
        component: FlightSearchComponent
    },
    {
        path: 'flight-edit/:id',
        component: FlightEditComponent
    }
}
```

Reading Parameters

```
export class FlightEditComponent {
    id = '';

    constructor(private route: ActivatedRoute) {
        route.params.subscribe(
            (params) => {
                this.id = params['id'];
                […]
            }
        );
    }
    […]
}
```

Reading Parameters

```
export class FlightEditComponent {
    id = '';

    constructor(private route: ActivatedRoute) {
        route.paramMap.subscribe(
            (paramMap) => {
                this.id = paramMap.get('id');
                […]
            }
        );
    }
    […]
}
```

Reading Parameters

```
export class FlightEditComponent {
    id?: number;

    constructor(private route: ActivatedRoute) {
        route.paramMap.subscribe(
            paramMap => {
                this.id = +paramMap.get('id'); // or
                this.id = Number(paramMap.get('id')); // or
                this.id = parseInt(paramMap.get('id'));
            }
        );
    }
    […]
}
```

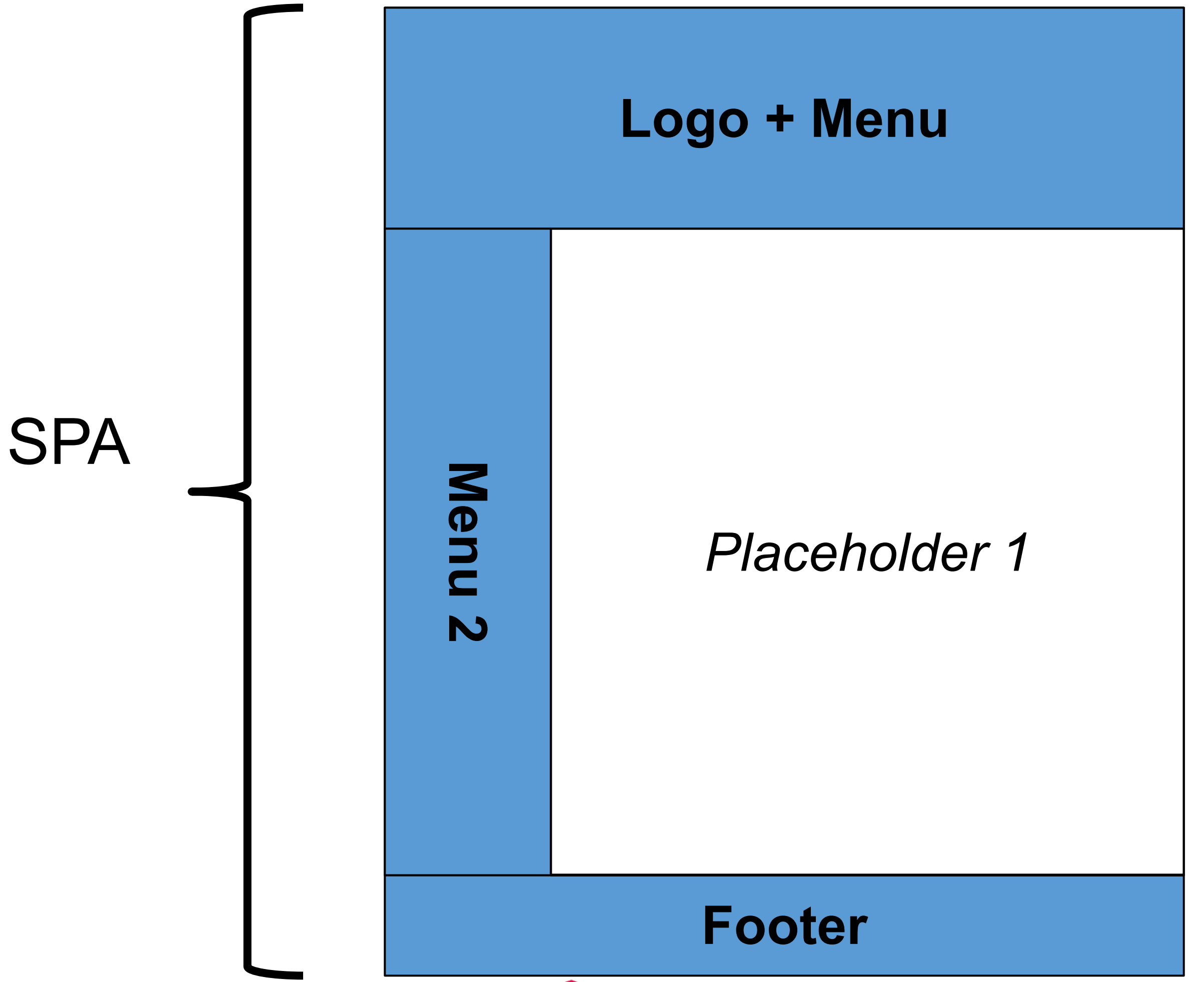
Links for Routes with Parameters

```
<a [routerLink]="['/flight-edit', flight.id, { showDetails: "true" }]">Edit</a>
```

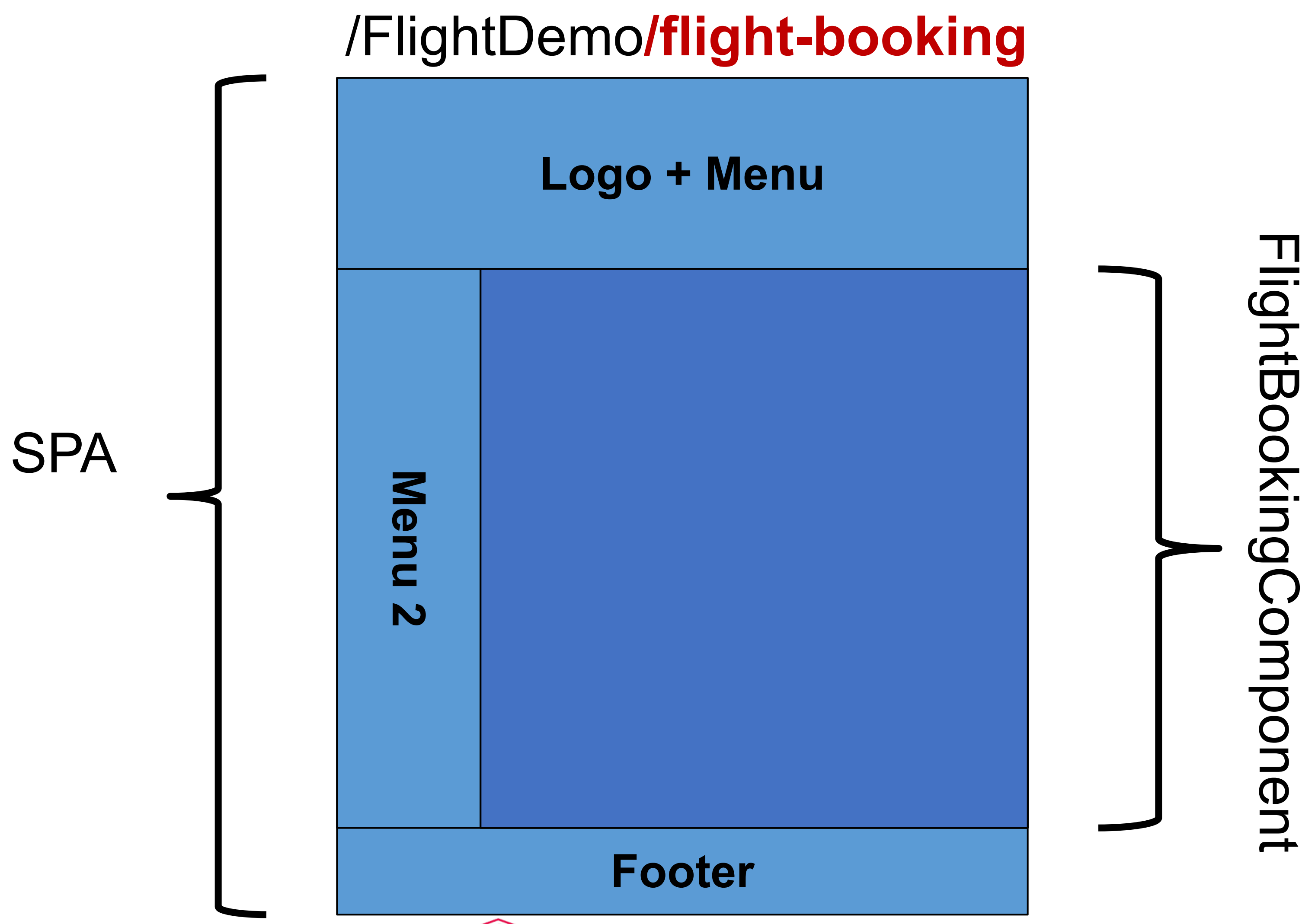
DEMO

Hierarchical Routing

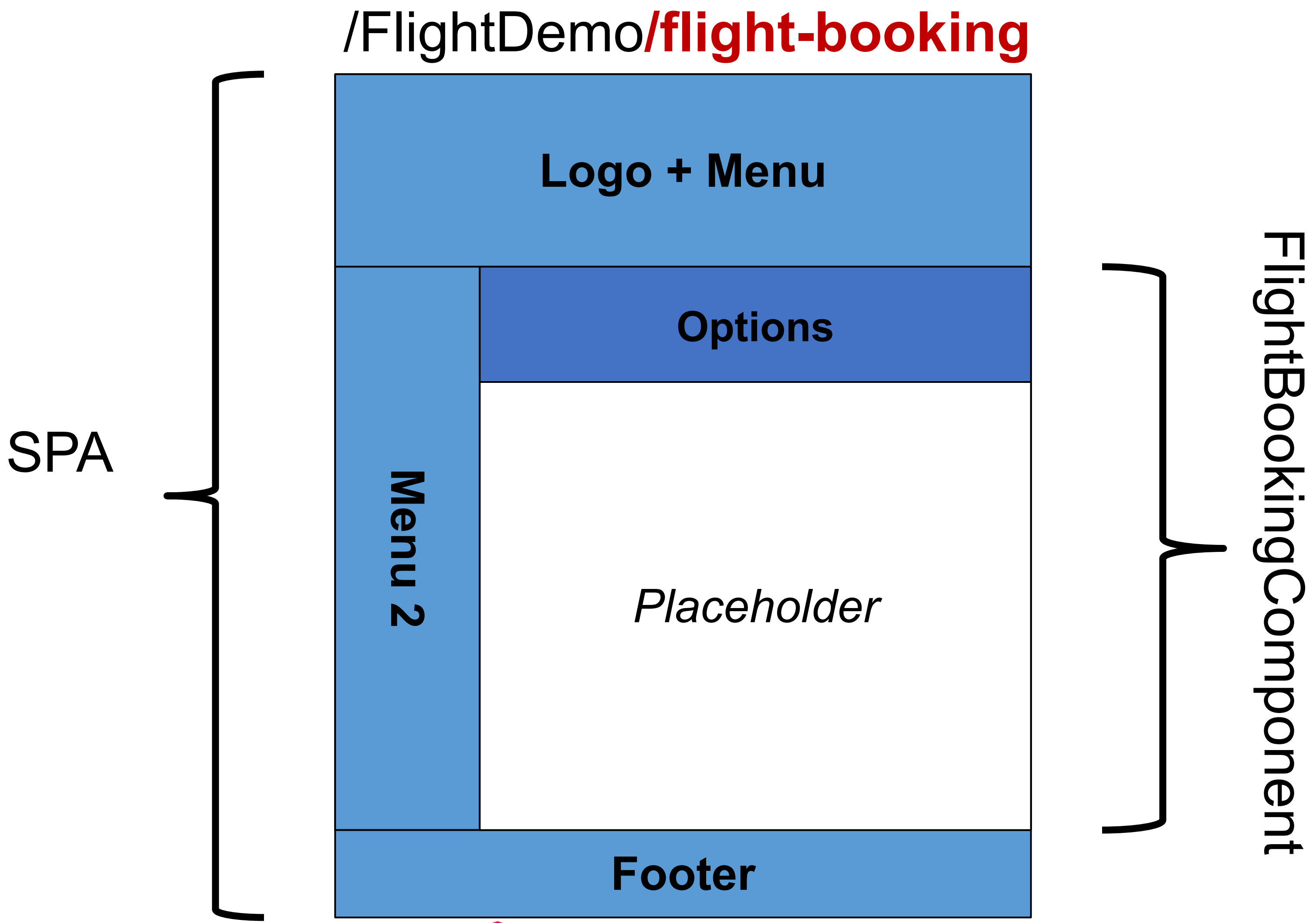
Hierarchical Routing



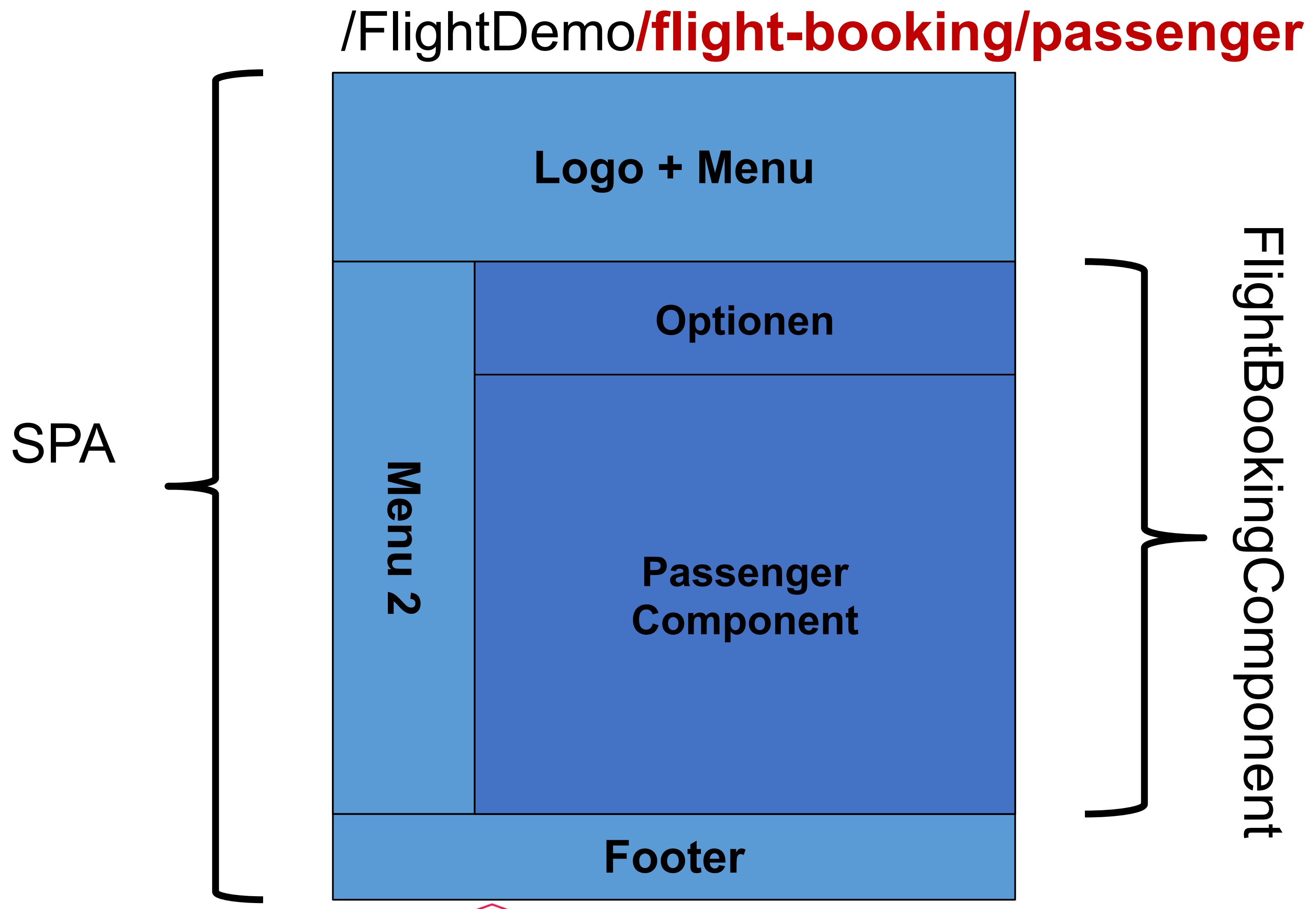
Hierarchical Routing



Hierarchical Routing

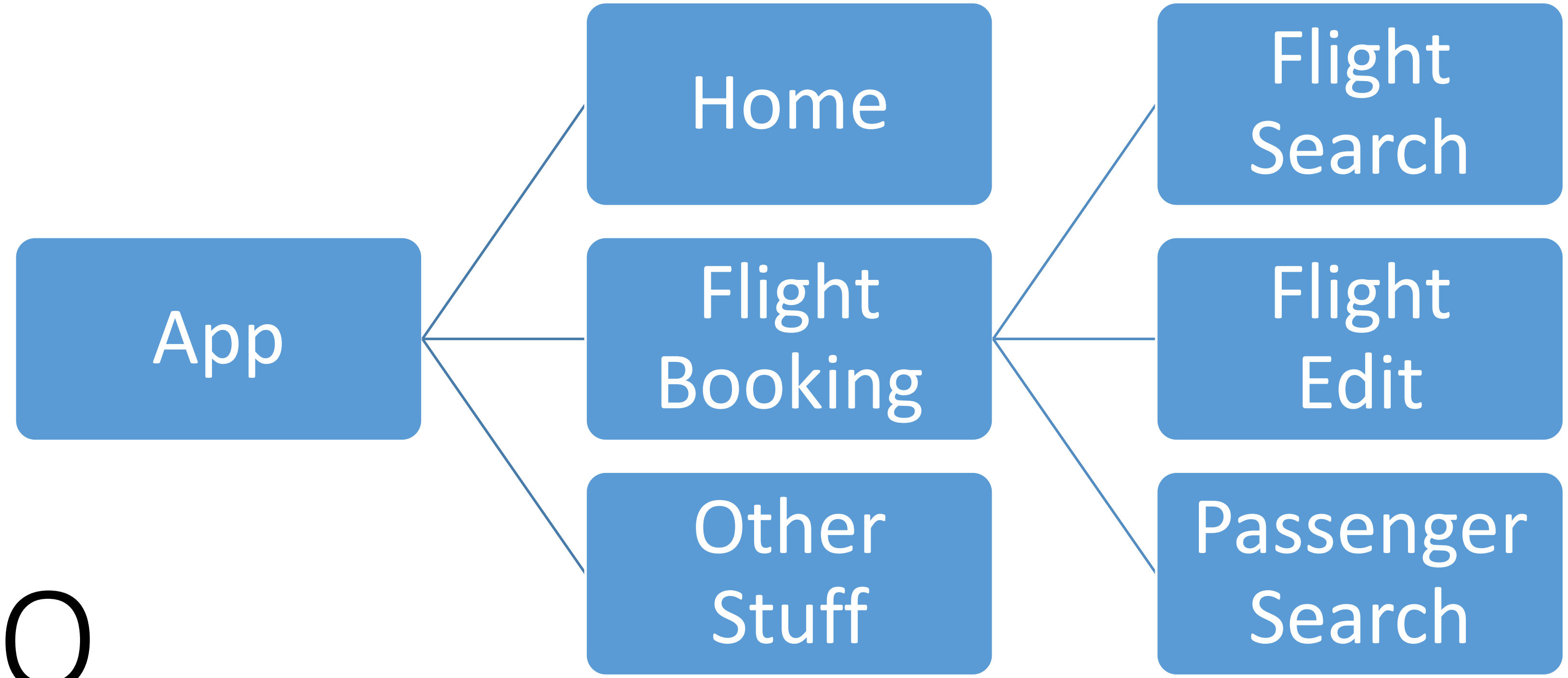


Hierarchical Routing



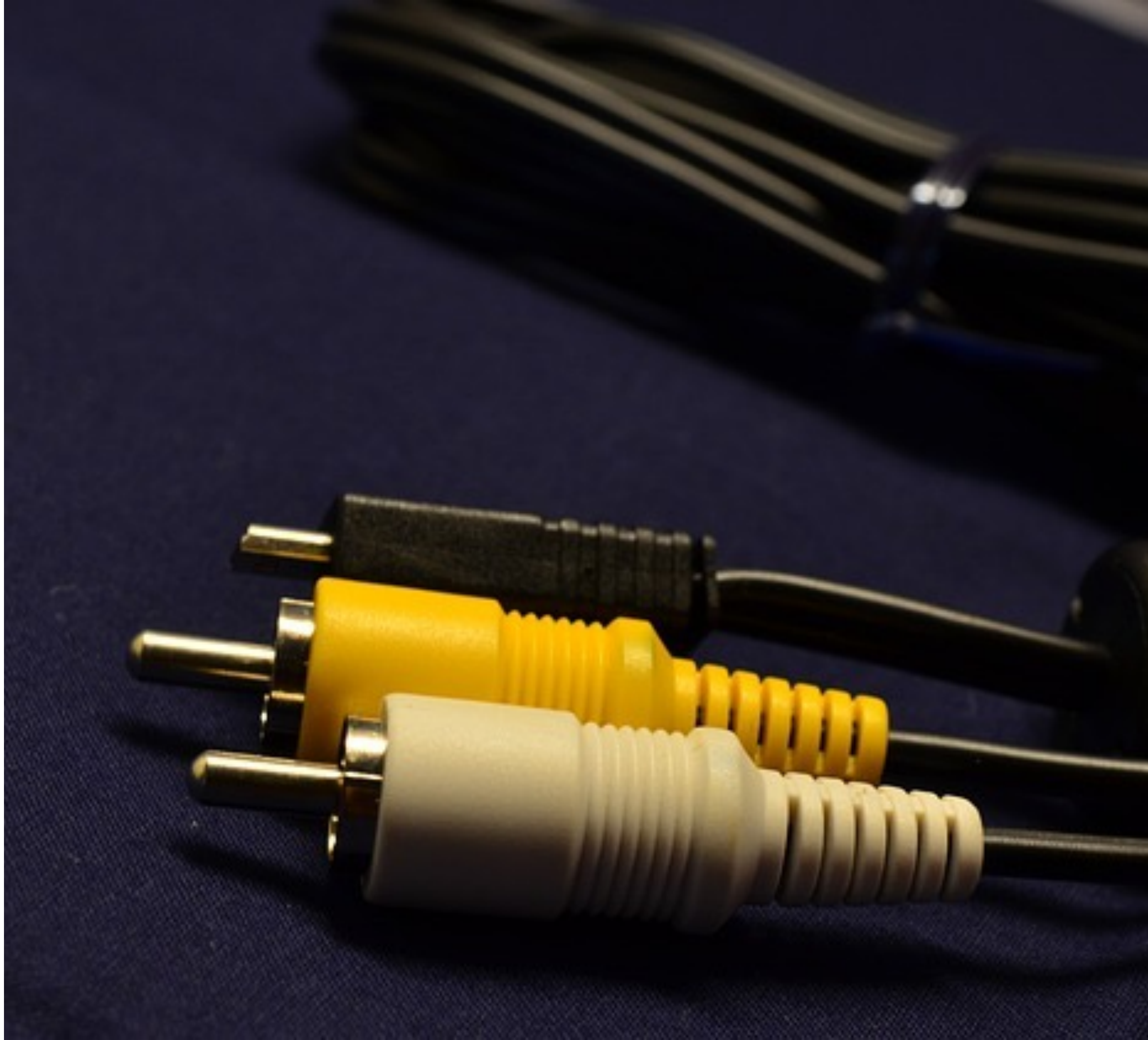
Configuration

```
const appRoutes: Routes = [
    {
        path: '',
        component: HomeComponent
    },
    {
        path: 'flight-booking',
        component: FlightBookingComponent,
        children: [
            {
                path: 'flight-search',
                component: FlightSearchComponent
            },
            […]
        ]
    }
];
```

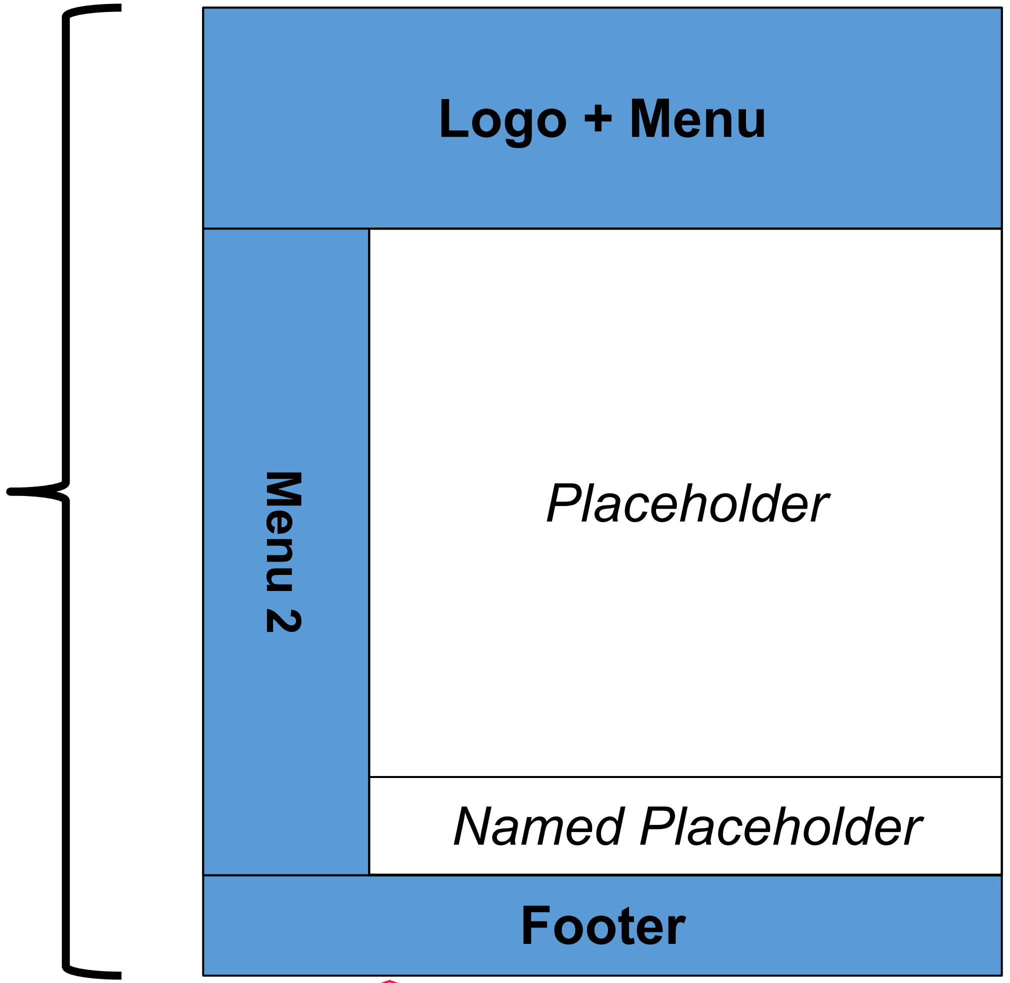

App
Home
Flight Booking
Other Stuff
Flight Search
Flight Edit
Passenger Search

DEMO

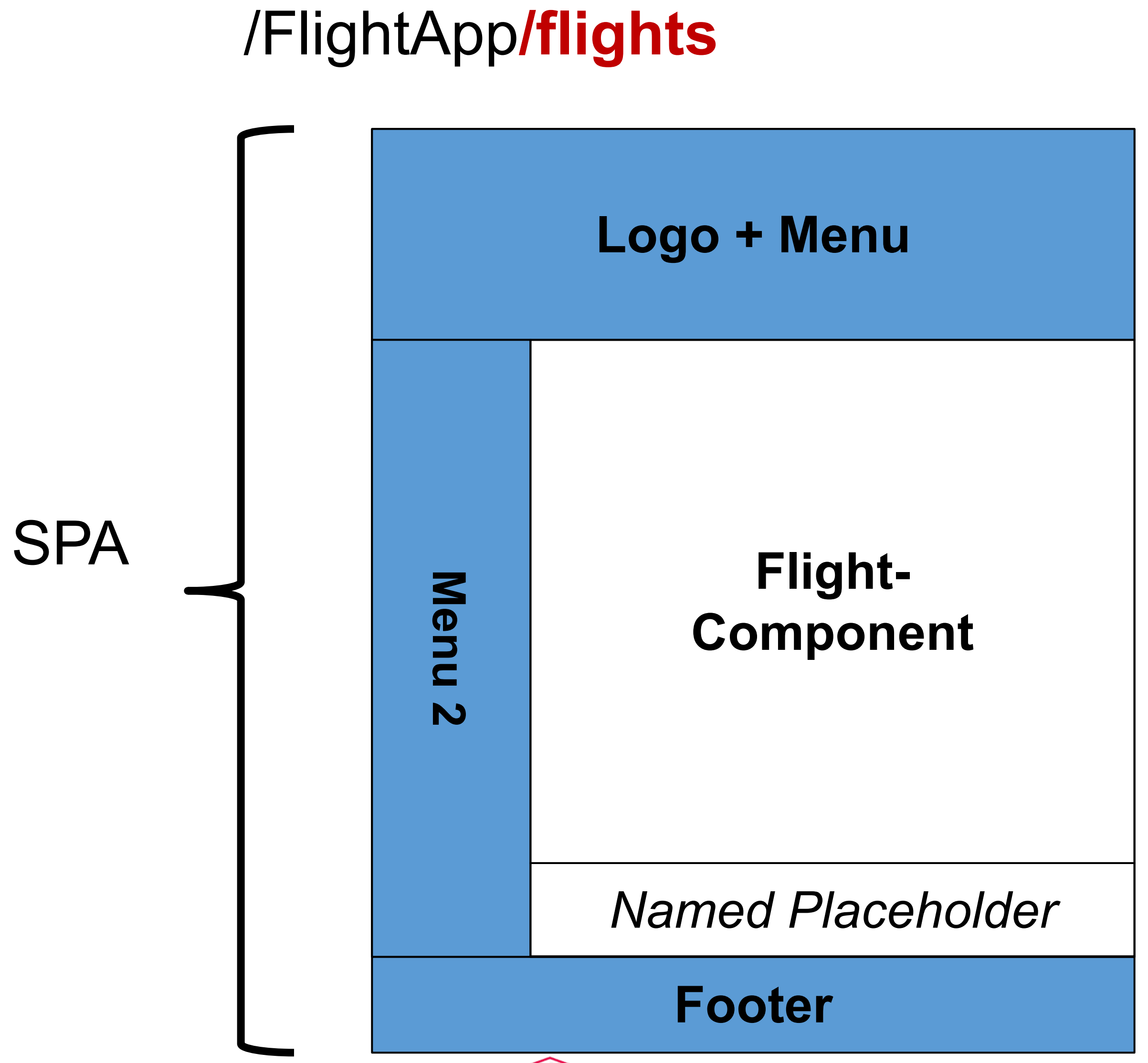
Aux Routes



Aux-Routes

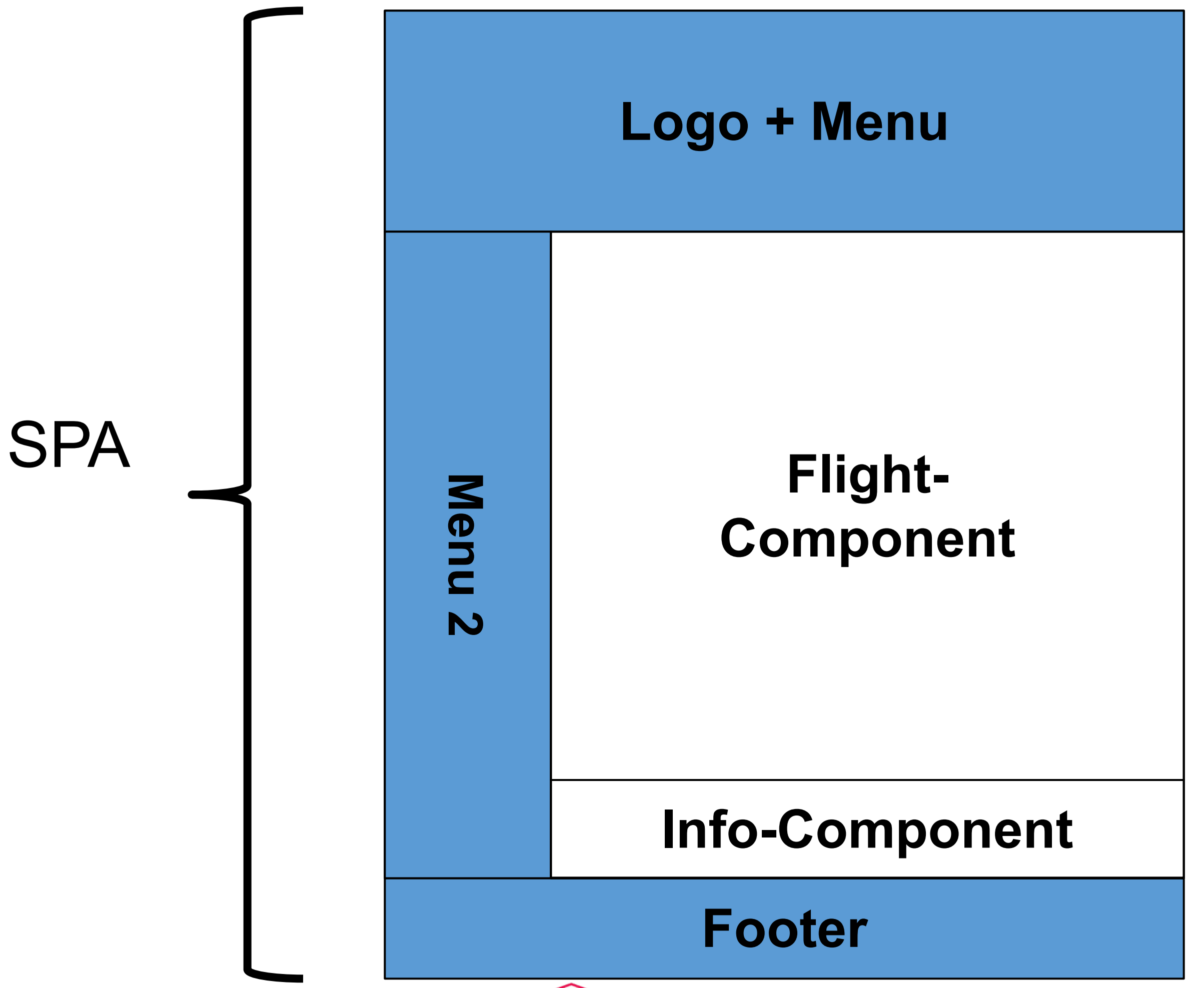


Aux-Routes


/FlightApp/flights
SPA
Logo + Menu
Menu 2
Flight-Component
Named Placeholder
Footer

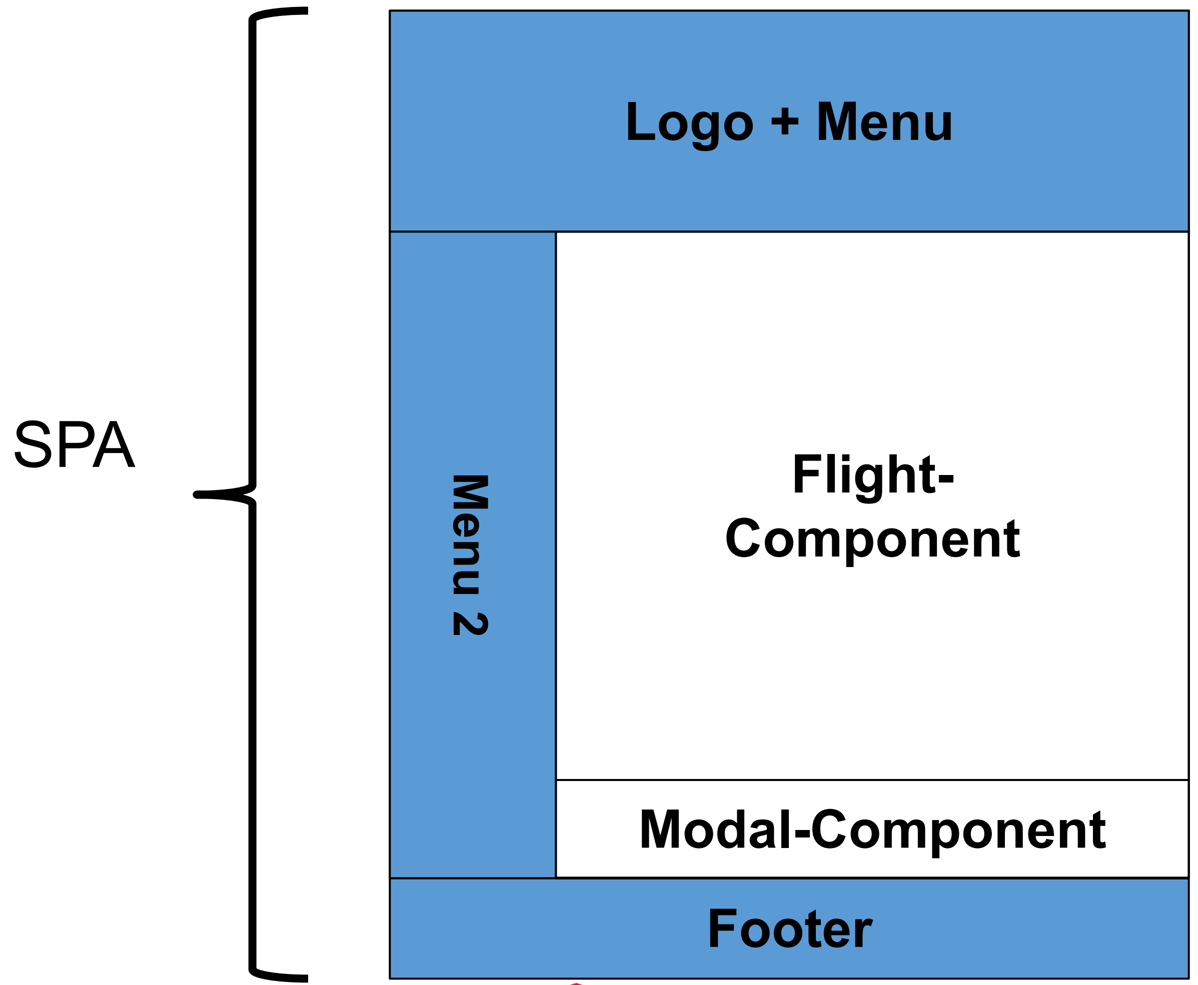
Aux-Routes

/FlightApp/**flights(aux:info)**



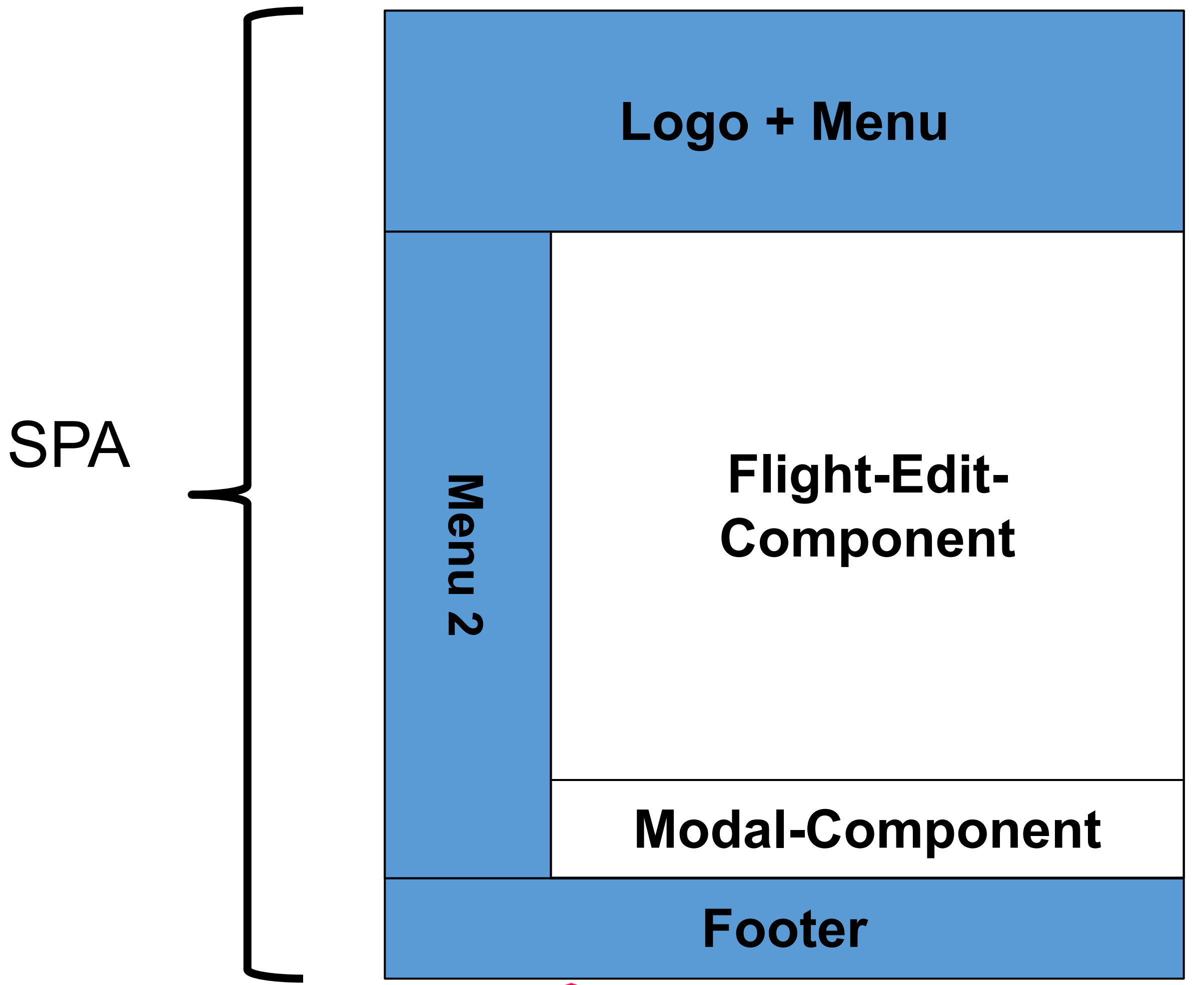
Aux-Routes

/FlightApp/**flights(aux:info/modal)**



Aux-Routes

/FlightApp**/flights(aux:info/modal)/edit/17**



Use Cases

- Partly autonomous parts of an application
- „Norton Commander Style“
- (CSS-based) Popups and Modals

Define Outlets

Default Name: primary

```
<router-outlet></router-outlet>

<hr>

<router-outlet name="aux"></router-outlet>
```

Configuration

```
export const appRoutes: Routes = [
    {
        path: 'home',
        component: HomeComponent
    },
    {
        path: 'info',
        component: InfoComponent,
        outlet: 'aux'
    },
    {
        path: 'dashboard',
        component: DashboardComponent,
        outlet: 'aux'
    }
]
```

Activating Aux-Routes

```
<a [routerLink]="[{ outlets: { aux: 'info' } }]">
    Activate Info
</a>

<a [routerLink]="['/', { outlets: { aux: null } }]">
    Deactivate Info
</a>
```

Activating Several Aux Routes at Once

```
<a [routerLink]="[{ outlets: {
                     aux: 'basket',
                     primary: 'flight-booking/flight-search' }
                 }]"> … </a>


<a [routerLink]="[{ outlets: {
                     aux: 'basket',
                     primary: ['flight-booking', 'flight-search'] }
                 }]"> … </a>


<a [routerLink]="[{ outlets: {
                     aux: 'basket',
                     primary: ['flight-booking', 'flight-edit', 17] }
                 }]"> … </a>
```

INSIDE KNOWLEDGE

Code-based Routing

```
export class AppComponent {
    constructor(private router: Router) {}

    activateInfo(): void {
        this.router.navigate([{ outlets: { aux: 'info' } }]);
    }

    deactivateInfo(): void {
        this.router.navigate(['/', { outlets: { aux: null } }]);
    }
}
```

DEMO

Lab

Guards

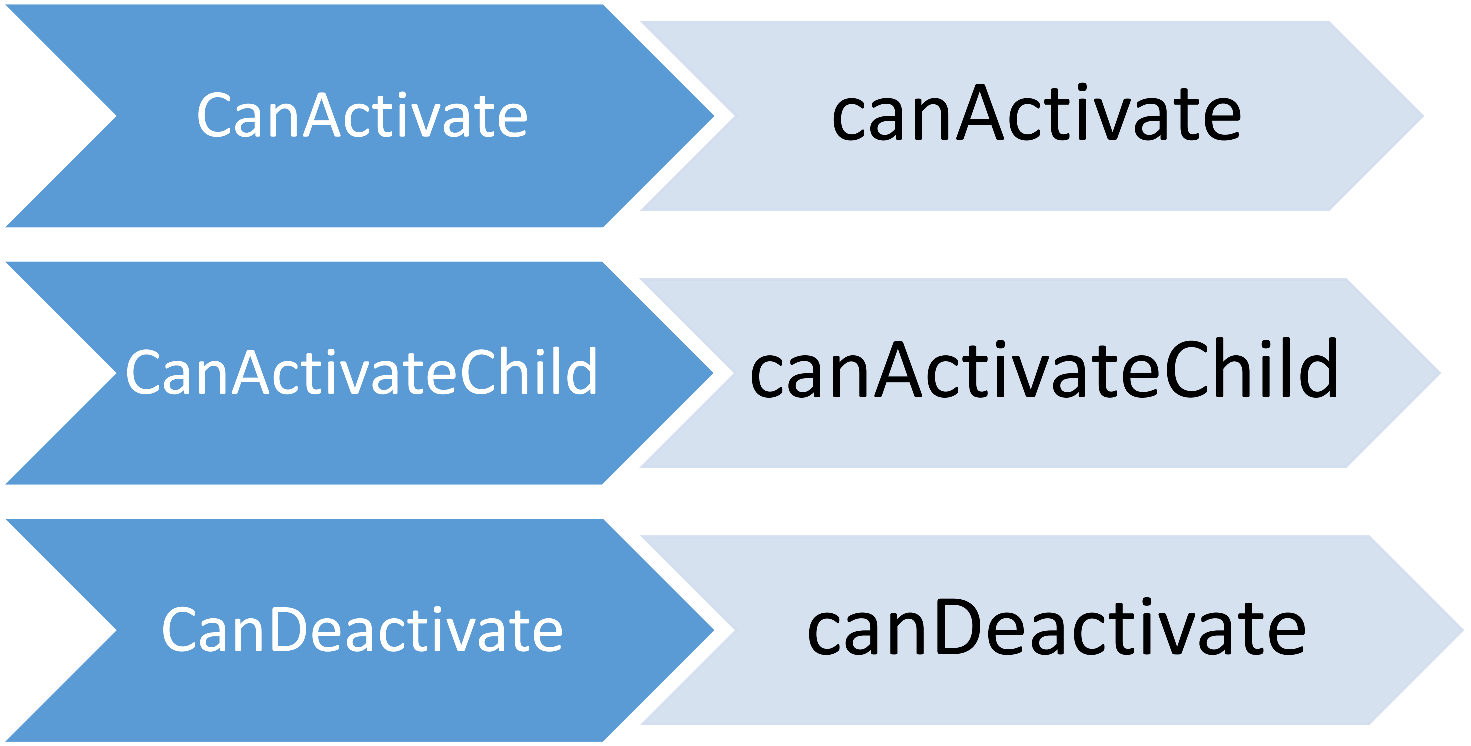
What are Guard?

- ~~Services (deprecated)~~

- const function (since NG 14)

- Can prevent the Activation or Deactivation of a Route

Guards



Result: boolean | Observable<boolean> | Promise<boolean>

Example

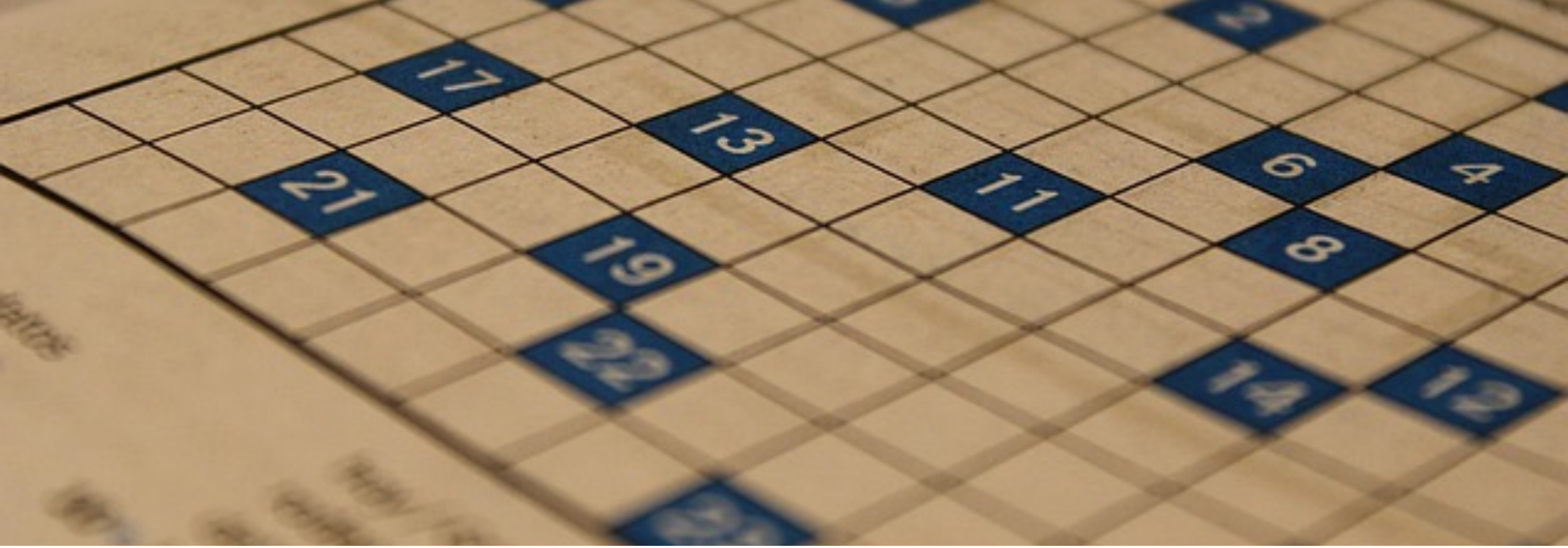
```
export const authGuard = () => {
  const authService = inject(AuthService);
  const router = inject(Router);

  if (authService.userName) {
    return true;
  }

  // Redirect to the login page
  return router.navigate(['/home', { needsLogin: true }]);
};
```

ANGULAR ARCHITECTS INSIDE KNOWLEDGE SOFTWARE ARCHITECT

DEMO



Resolver

What are Resolver?

- Services
- Are activated when the Router switches over to another route
- Can load needed data
- Postpone activation of target route until data is loaded
- Meanwhile, a loading indicator can be shown

Resolver

```
@Injectable()
export class FlightResolver implements Resolve<Flight> {
    constructor(private flightService: FlightService) {}

    resolve(route, state):
           Observable<Flight> | Promise<Flight> | any {

        return […]
    }
}
```

Register Resolver

```
const flightBookingRoutes: Routes = [
    […]

    {
        path: 'flight-edit/:id',
        component: FlightEditComponent,
        resolve: {
            flight: FlightResolver  <------------------------ Token
        }
    }

];
```

Receive Data in Component

```
@Component({ … })
export class FlightEditComponent {
    flight?: Flight;

    constructor(private route: ActivatedRoute) {}

    ngOnInit(): void {
        this.route.data.subscribe(
            data => {
                this.flight = data['flight'];
            }
        );
    }
}
```

DEMO

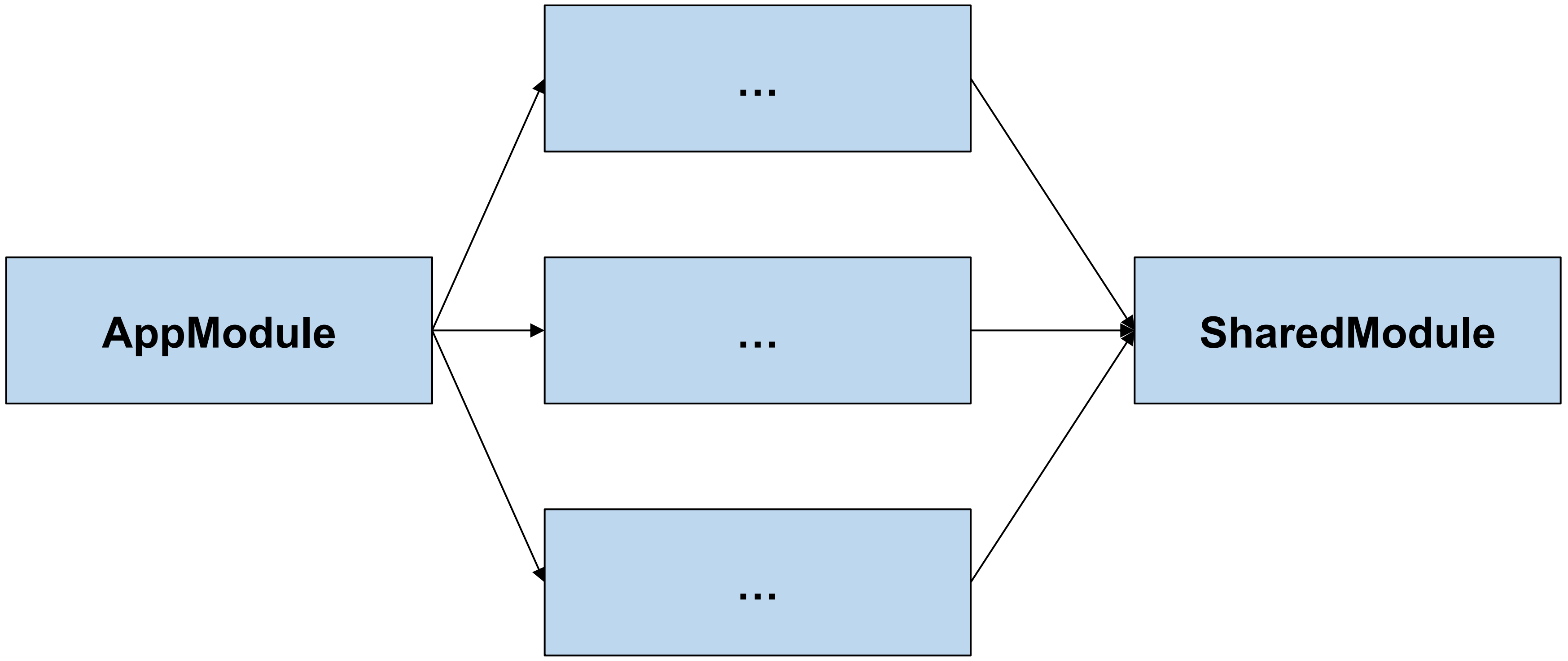
Lab

Lazy Loading

Why Lazy Loading?

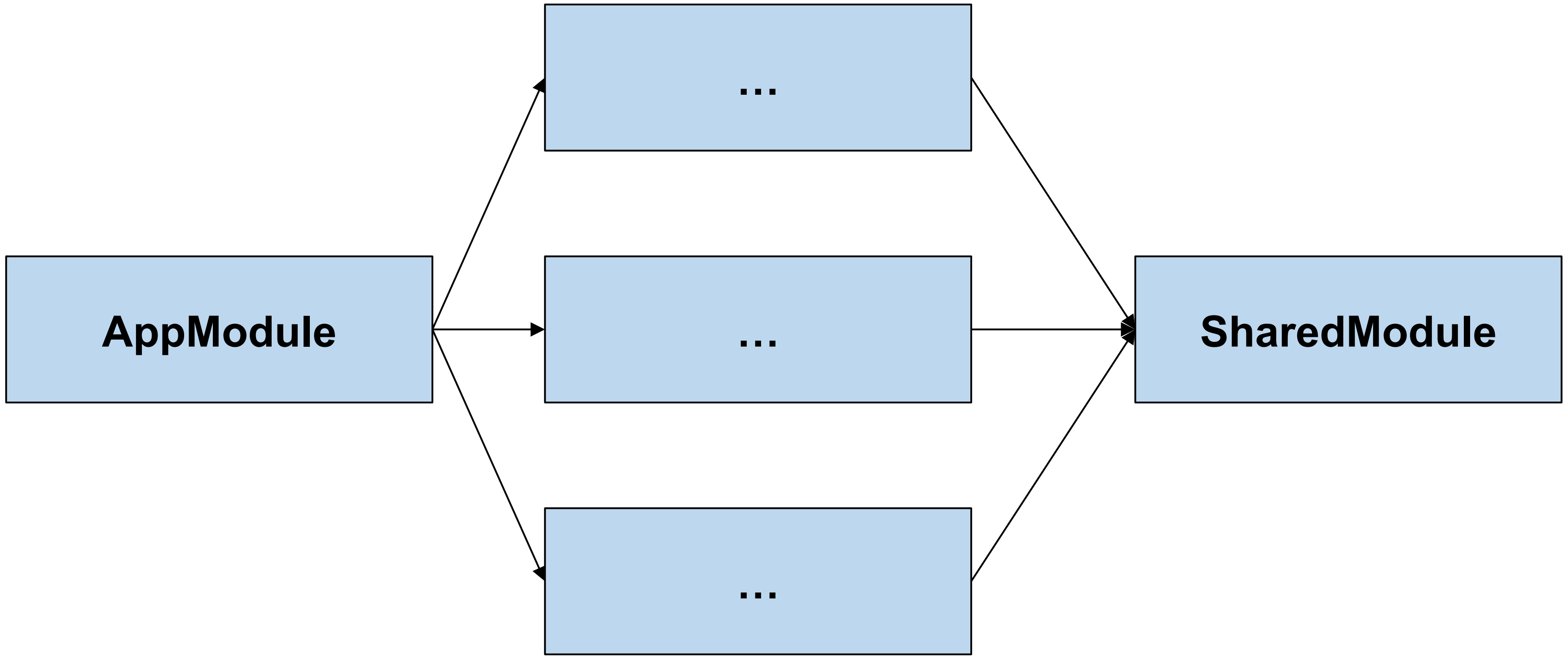
- Improve initial load time (performance → very important!)

Module Structure



Root Module **Feature Modules** **Shared Module**

Lazy Loading



Root Module **Feature Modules** **Shared Module**

App Routes with Lazy Loading

```
export const appRoutes: Routes = [
    {
        path: 'home',
        component: HomeComponent
    },
    {
        path: 'flights_module',
        loadChildren: () => import('./flights/flights.module')
                                .then((m) => m.FlightsModule)
    },
    {
        path: 'flights_standalone',
        loadChildren: () => import('./flights/flights.routes')
                                .then((m) => m.flightsRoutes)
    }
];
```

Routes for "lazy" Feature

```
export const flightsRoutes: Routes = [
    {
        path: 'flight-search',
        component: FlightSearchComponent,
        […]
    },
    […]
}

export default flightsRoutes;
```

flights/ flight-search

Triggers Lazy Loading w/ loadChildren

DEMO – Lazy Loading

Lazy Loading

- Lazy Loading means: Load it later, after startup
- Better initial load performance
- But: Delay during execution for loading on demand

Preloading

Idea

- Once the initial load (the important one) is complete load the lazy loaded modules (before they are even used)

- When module is needed it is available immediately

Activate Preloading (in AppModule)

```
…
imports: [
    […]
    RouterModule.forRoot(
        appRoutes, { preloadingStrategy: PreloadAllModules }
    );
]
…
```

ANGULAR ARCHITECTS INSIDE KNOWLEDGE SOFTWARE ARCHITECT

Activate Preloading (in app.config.ts)

```
…
providers: [
    […]
    provideRouter(
        appRoutes, withPreloading(PreloadAllModules),
    ),
]
…
```

DEMO – Preloading

Intelligent Preloading with ngx-quicklink

```
…
imports: [
    […]
    QuicklinkModule,
    RouterModule.forRoot(
        appRoutes, { preloadingStrategy: QuicklinkStrategy }
    );
]
…
```

https://web.dev/route-preloading-in-angular/

https://www.npmjs.com/package/ngx-quicklink

DEMO – Ngx Quicklink

Or CustomPreloadingStrategy

```
…
imports: [
    […]
    RouterModule.forRoot(
        appRoutes, { preloadingStrategy: CustomPreloadingStrategy }
    );
]
…
```

LAB

Summary

Child Routes & Parameters

Aux Routes

Guards

Lazy Loading & Preloading

Homework for this evening

1. Check at least one of your teams Angular projects

2. Find out what Angular Forms are being used there

3. Report your findings tomoro morning to our group