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Dependency Injection Deep Dive

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Content

- Classic Providers
- Tree-shakable Providers
- Scopes
- Constants as Tokens
- Services and Lazy Loading
- Multi Providers



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Classic Providers



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Service

```
@Injectable()  
export class FlightService {  
  
    [...]  
  
}
```



Classic Providers

```
@NgModule({  
  imports: [  
    BrowserModule, HttpClientModule, FormsModule  
  ],  
  declarations: [  
    AppComponent, FlightSearchComponent  
  ],  
  providers: [  
    FlightService  
  ],  
  bootstrap: [  
    AppComponent  
  ]  
})  
export class AppModule {  
}
```



Standalone Components

```
bootstrapApplication(AppComponent, {  
  providers: [  
    FlightService  
  ]  
})
```



Injecting Service into Consumer

```
@Component({  
    selector: 'flight-search',  
    templateUrl: 'flight-search.html'  
})  
export class FlightSearchComponent {  
    from = '';  
    to = '';  
    flight: Flight[] = [];  
  
    constructor(private flightService: FlightService) { ... }  
  
    flightSearch() { [...] }  
    selectFlight(flight) { [...] }  
}
```



Injecting Service into Consumer – NEW in V14

```
@Component({  
  selector: 'flight-search',  
  templateUrl: 'flight-search.html'  
})  
export class FlightSearchComponent {  
  from = '';  
  to = '';  
  flight: Flight[] = [];  
  
  flightService = inject(FlightService);  
  
  flightSearch() { [...] }  
  selectFlight(flight) { [...] }  
}
```



Abstraction

```
export abstract class FlightService {  
    abstract find(from: string, to: string): Observable<Flight[]>;  
}
```

```
@Injectable()  
export class DefaultFlightService implements FlightService {  
    find(from: string, to: string): Observable<Flight[]> { ... }  
}
```



"Forward" with useClass

```
@NgModule({
  imports: [
    BrowserModule, HttpClientModule, FormsModule
  ],
  declarations: [
    AppComponent, FlightSearchComponent
  ],
  providers: [
    { provide: FlightService, useClass: DefaultFlightService }
  ],
  bootstrap: [
    AppComponent
  ]
})
export class AppModule {
}
```



"Forward" with useClass

```
@NgModule({
  imports: [
    BrowserModule, HttpClientModule, FormsModule
  ],
  declarations: [
    AppComponent, FlightSearchComponent
  ],
  providers: [
    { provide: FlightService, useClass: DefaultFlightService }
  ],
  bootstrap: [
    AppComponent
  ]
})
export class AppModule {
}
```



"Forward" with useClass

```
@NgModule({
  imports: [
    BrowserModule, HttpClientModule, FormsModule
  ],
  declarations: [
    AppComponent, FlightSearchComponent
  ],
  providers: [
    { provide: FlightService, useClass: DefaultFlightService }
  ],
  bootstrap: [
    AppComponent
  ]
})
export class AppModule {
}
```

↑
Token

↑
Service



Tokens

- Interfaces **cannot** be used as tokens
- However, you can use abstract classes instead



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useFactory

```
const DEBUG = !environment.production;
[...]
```

```
providers: [{
  provide: FlightService,
  useFactory: (http: HttpClient) => {
    if (DEBUG) {
      return new DummyFlightService();
    } else {
      return new FlightService(http);
    }
  },
  [...]
}]
```



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useFactory

```
const DEBUG = true;
[...]
```

```
providers: [{
  provide: FlightService,
  useFactory: (http: HttpClient) => {
    if (DEBUG) {
      return new DummyFlightService();
    } else {
      return new FlightService(http);
    }
  },
  deps: [HttpClient]
}]
```



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Types of Providers

useClass

useValue

useFactory

useExisting



Tree-Shakable Provider



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Example

App scope



```
@Injectable({ providedIn: 'root' })  
export class FlightService {  
  
    [...]  
  
}
```



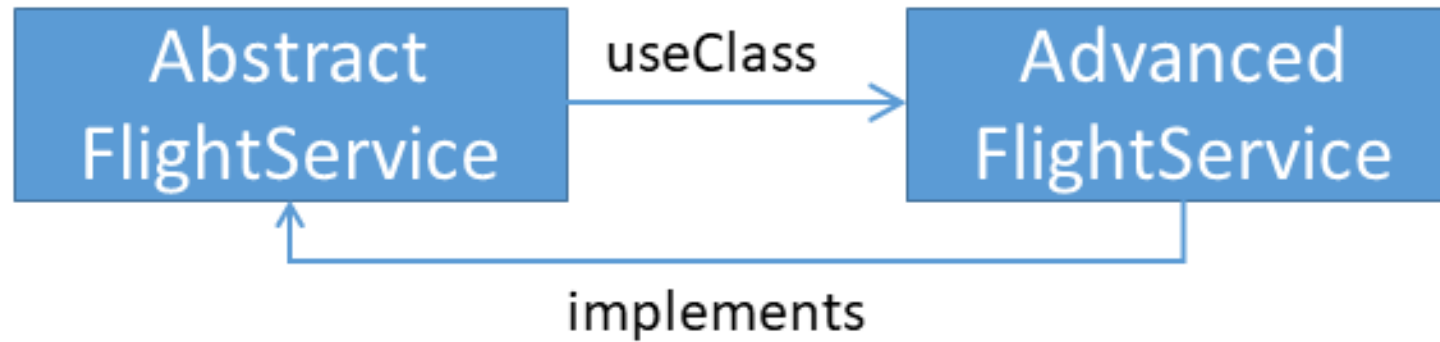
useClass

```
@Injectable({  
  providedIn: 'root',  
  useClass: DefaultFlightService  
})  
export abstract class FlightService {  
  abstract find(from: string, to: string);  
}
```

```
@Injectable()  
export class DefaultFlightService implements FlightService {  
  
  find(from: string, to: string) { ... }  
  
}
```



implements vs. extends



useFactory

```
@Injectable({
  providedIn: 'root',
  useFactory: (http: HttpClient) => {
    return new DefaultFlightService(http);
  },
  deps: [HttpClient]
})
export abstract class FlightService {

  abstract find(from: string, to: string): Observable<Flight[]>;

}
```



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DEMO



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Scopes



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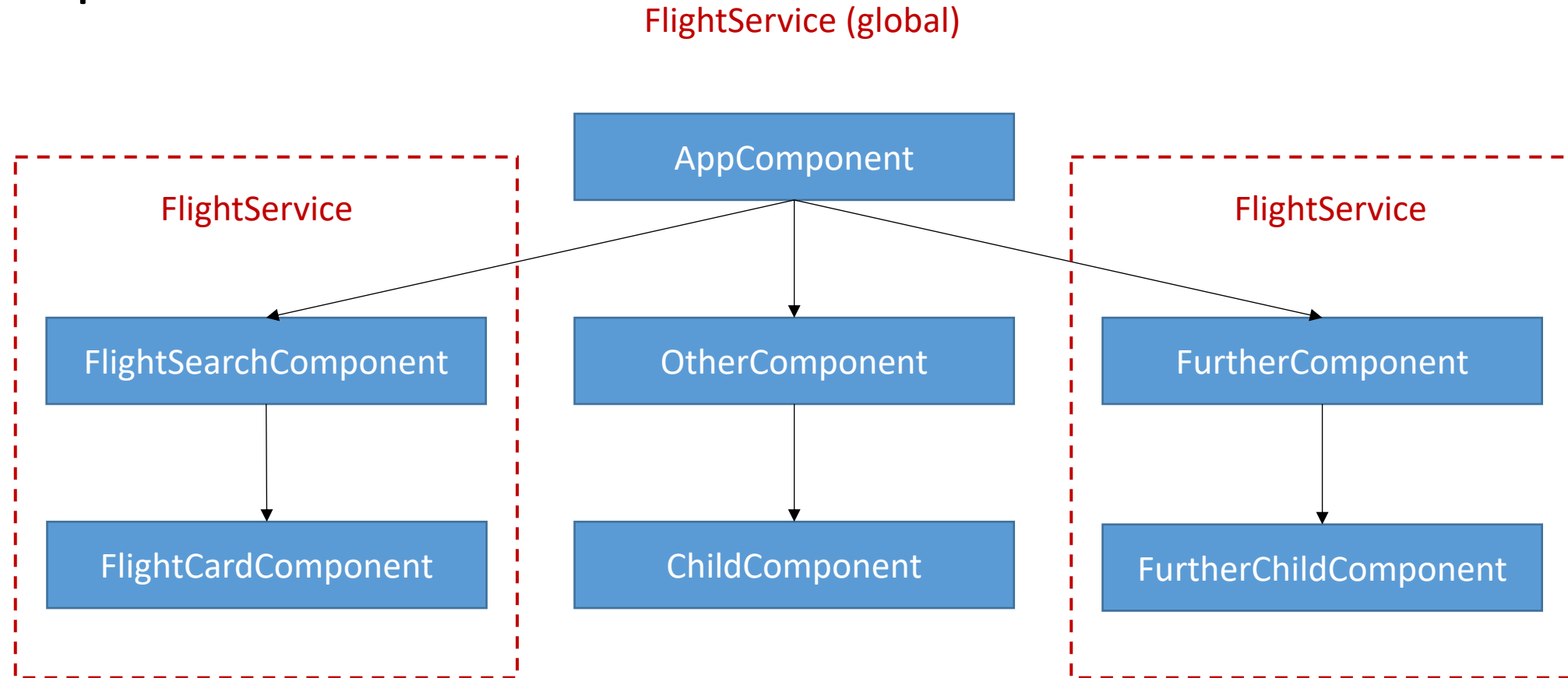
"Locale Service": Own Scope

```
@Component({  
  selector: 'flight-search',  
  templateUrl: 'app/flight-buchen/flight-buchen.html',  
  providers: [{ provide: FlightService, useClass: FlightService}]  
})  
export class FlightSearchComponent {  
  
  [...]  
  
}
```

Can be used in current component and below!



Scopes



DEMO



Multi Providers



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Multi

```
[...]  
providers: [  
  { provide: FlightService, useClass: LufthansaFlightService, multi: true },  
  { provide: FlightService, useClass: AustrianFlightService, multi: true }  
]  
[...]
```

```
export class AppComponent {  
  
  constructor(  
    @Inject(FlightService) private flightServices: FlightService[]) {  
  }  
  [...]  
}
```



Multi and Constants

```
[...]  
providers: [  
  { provide: FLIGHT_SERVICES, useClass: LufthansaFlightService, multi: true },  
  { provide: FLIGHT_SERVICES, useValue: AustrianFlightService, multi: true }  
]  
[...]
```

```
export class AppComponent {  
  
  constructor(  
    @Inject(FLIGHT_SERVICES) private flightServices: FlightService[]) {  
  }  
  [...]  
}
```



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Summary

- forRoot vs. in component
- Classic providers vs. tree-shakable providers
- Factories
- Multi Providers



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