
ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE
Angular's Future with Signals
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Agenda

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& Basics

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Outlook: Signal
Components

Motivation & Basics

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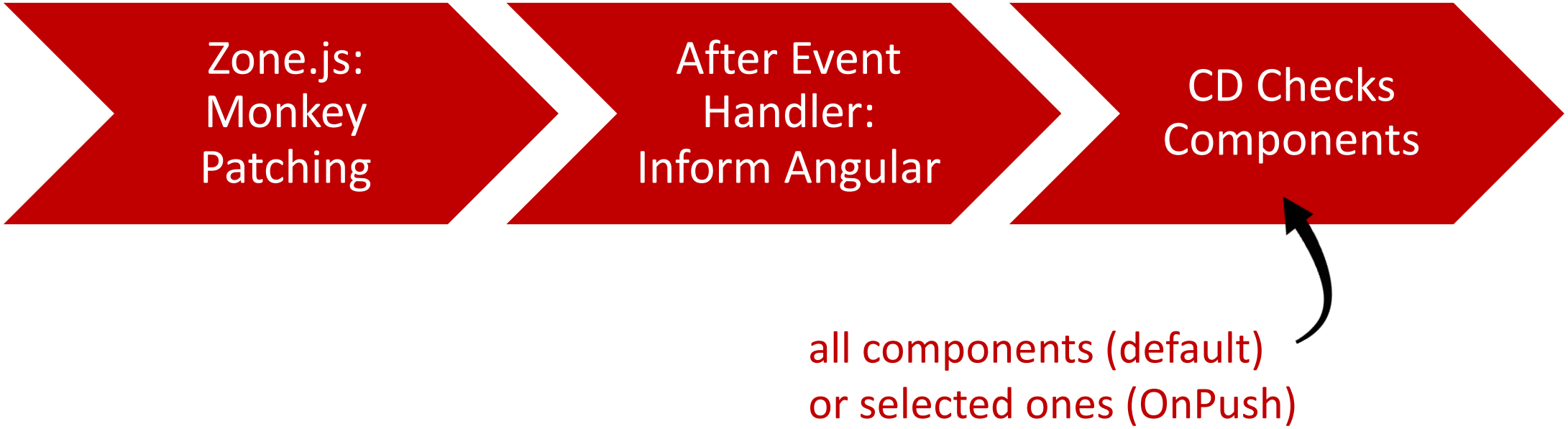
Change Detection (CD) in Angular



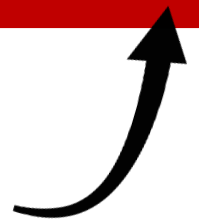
Drawbacks

Zone.js: Magic

Zone.js: ~100K

Cannot patch async/await

coarse grained CD



e.g. Components are always checked as a whole, even if only a tiny fraction changed

How Do Other Frameworks Solve This?

SOLID

SVELTE

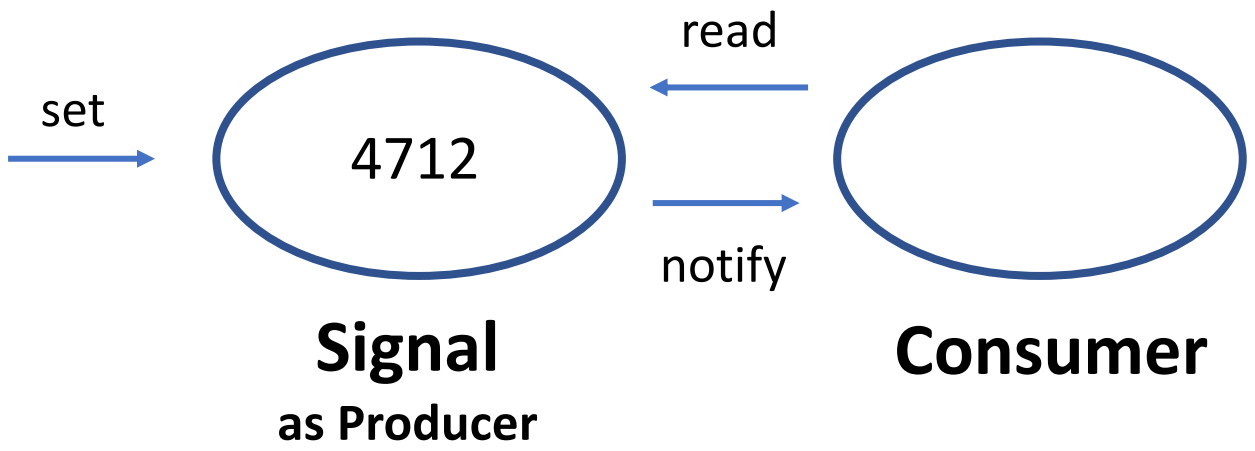
qwik

Signals!

How Will Angular Solve This?

Signals!

Signals: Simple Reactivity



Component Without Signals

```
flights: Flight[] = [];
```

```
const flights = await this.flightService.findAsPromise(from, to);
this.flights = flights;
```

```
<div *ngFor="let f of flights">
    <flight-card [item]="f" />
</div>
```

Component With Signals

```
flights = signal<Flight[]>([]);
```

```
const flights = await this.flightService.findAsPromise(from, to);
this.flights.set(flights);
```

```
<div *ngFor="let f of flights()">
    <flight-card [item]="f" />
</div>
```

RxJS and NGRX Interop

@angular/core/rxjs-interop

- toObservable(signal)
- toSignal(observable$)
- takeUntilDestroyed()

DEMO

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Signal Components

(Starting with Angular 17.1)

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Signal Based Components (V17.1)

```
@Component({
  signals: true,
  selector: 'app-temperature',
  template: `
    <p>C: {{ celsius() }}</p>
    <p>F: {{ fahrenheit() }}</p>
  `,
})
export class SimpleCounter {
  celsius = signal(0);
  fahrenheit = computed(() => this.celsius() * 1.8 + 32);
}
```

Signal Inputs (readonly, V17.1)

```
@Component({
  signals: true,
  selector: 'app-temperature',
  template: `
    <p>C: {{ celsius() }}</p>
    <p>F: {{ fahrenheit() }}</p>
  `,
})
export class TemperatureComponent {
  // celsius = input(0); // InputSignal<number>
  celsius = input.required<number>(); // InputSignal<number>
  fahrenheit = computed(() => this.celsius() * 1.8 + 32);
}
```

```
<!-- parent component template -->
<app-temperature [celsius]="25" />
```

Why Signal Inputs

- Will automatically mark **OnPush** components as dirty
- Type safety
  - Required inputs do not require initial values! ☺
    - or tricks to tell TypeScript that an input always has a value
  - Transforms are automatically checked
- Values can be easily derived upon changes using **computed()**
- Monitoring thru **effect()** instead of **ngOnChanges()**

Signal View Queries (V17.2)

```
@Component({
  template: ' <div #el></div> <my-component />'
})
export class TestComponent {

  // query for a single result by a string predicate
  divEl = viewChild<ElementRef>('el'); // Signal<ElementRef|undefined>
  // query for a single result by a type predicate
  cmp = viewChild(MyComponent); // Signal<MyComponent|undefined>
}
```

Signal Content Queries (V17.2)

```
@Component({…})
export class TestComponent {

  // query by a string predicate
  headerEl = contentChild<ElementRef>('h'); // Signal<ElementRef|undefined>

  // query by a type predicate
  header = contentChild(MyHeader); // Signal<MyHeader|undefined>
}
```

Signal Outputs (V17.3)

```
@Component({…})
export class TemperatureComponent {
  tempChange = output<number>(); // OutputEmitterRef<number>

  // or
  tempChangeSubject = new Subject<number>();
  tempChange = outputFromObservable(this.onNameChangeSubject); // OutputEmitterRef<number>
}
```

```
<!-- parent component template -->
<app-temperature (tempChange)="handleTempChange($event)" />
```

Why Signal Outputs

- The API is conceptually **aligned** with the new APIs for signal inputs
- Simpler API and removed complexity that isn’t relevant for outputs
- Automatic clean-up of outputs upon destruction (no unsubscribing)
- Improved type safety for new outputs & classical EventEmitters

Signal Model (V17.3)

```
@Component({…})
export class TemperatureComponent {
  temperature = model(0); // writeable InputSignal<number> & OutputEmitterRef<number>
}
```

```
<!-- parent component template -->
<app-temperature [(temperature)]="myTemperature" />
```

```
<!-- parent component template with signal -->
<app-temperature [temperature]="temperature()" (temperatureChange)="temperature.set($event)" />
```

Signal Based Components

Work w/o Zone.js

Interop with traditional components

Fine-grained CD

No need to update code!

Conclusion

Fine-grained CD

Zone-less Future

Convertible to Observables and vice versa!

No need to unsubscribe!

No need to update code!