ANGULAR
ARCHITECTS
INSIDE KNOWLEDGE

Template-driven Forms and Validation

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Outline

- Approaches
- Template-driven forms
  - How to use
- Reactive forms
  - How to use

Forms in Angular

Template-driven

- Add ngModel within the view template (.html)
- Angular creates object tree for form
- FormsModule

Reactive

- We create the object tree in our component (.ts)
- More control, more power
- ReactiveFormsModule

Template-driven Forms

Template-driven Forms

```
export class FlightSearchComponent {
    from = '';
    to = '';

    constructor(private readonly flightService: FlightService) {
            this.from = 'Graz';
            this.to = 'Hamburg';
    }
}
```

Template-driven Forms

```
export class FlightSearchComponent {
    from = 'Graz';
    to = 'Hamburg';

    private readonly flightService = inject(FlightService);
}
```

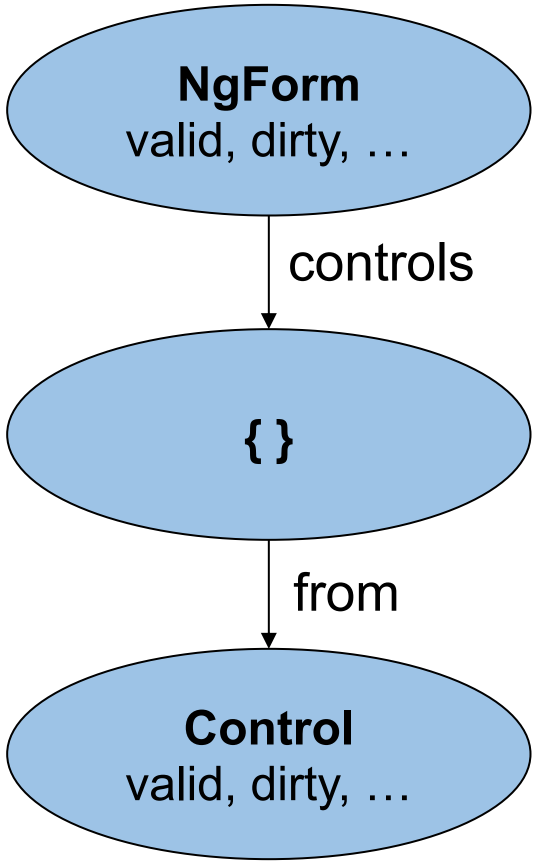
View

```
<form>

    <input type="text" name="from"
        [(ngModel)]="from" required minlength="3">

    […]

</form>
```



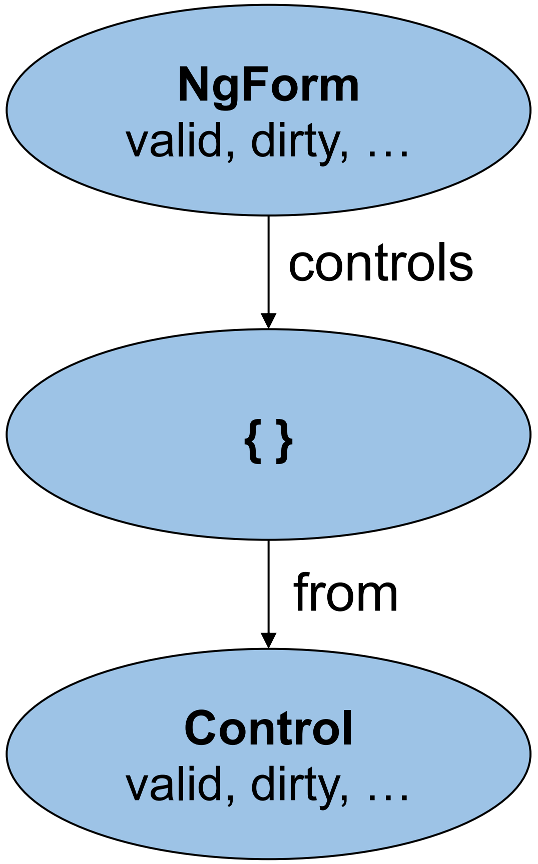
View

```
<form #flightSearchForm="ngForm">

    <input type="text" name="from"
        [(ngModel)]="from" required minlength="3">

    […]

</form>
```

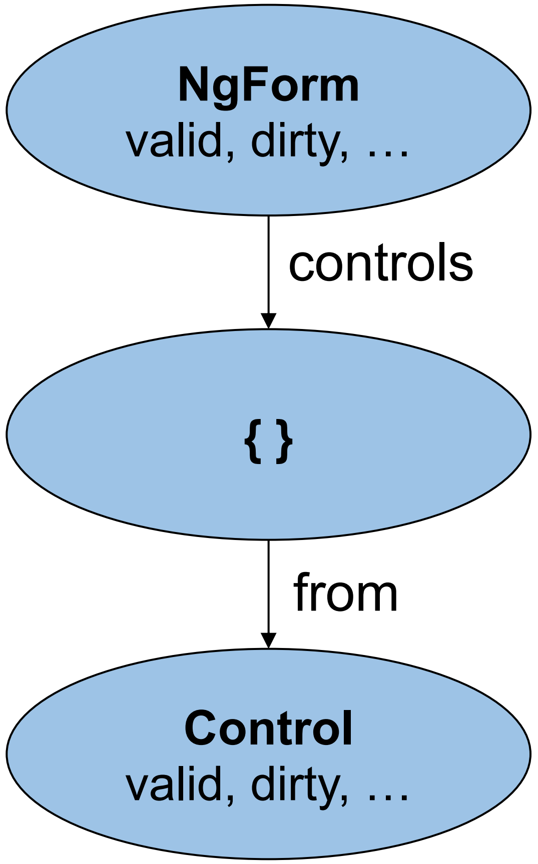


View

```
<form #f="ngForm">

    <input type="text" name="from"
        [(ngModel)]="from" required minlength="3">

    @if (f.controls['from'].invalid) {
        …From error…
    }
</form>
```



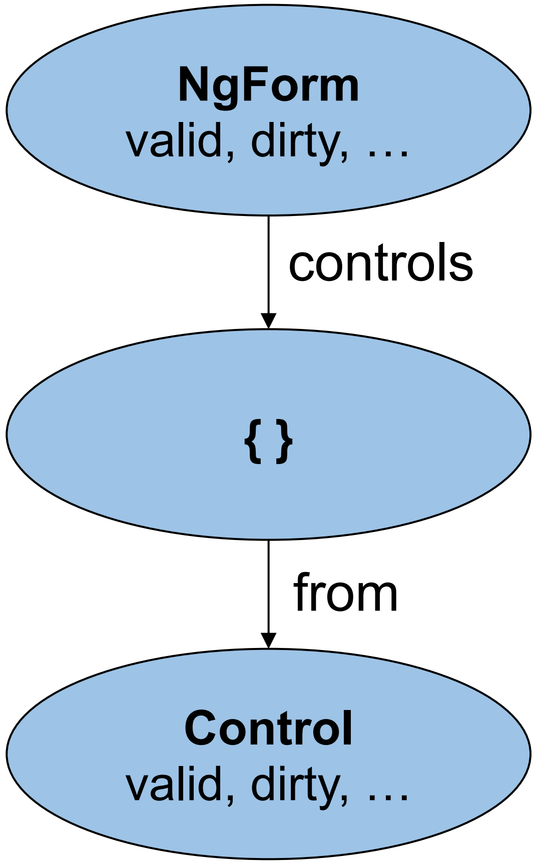
View

```
<form #f="ngForm">

    <input type="text" name="from"
        [(ngModel)]="from" required minlength="3">

    @if (f.controls['from'].invalid) {
        …From error…
    }

    @if (f.controls['from'].errors['required']) {
        …From is required…
    }
</form>
```


$$\begin{tikzcd}
\textbf{NgForm} \text{ valid, dirty, …} \arrow[d, "\text{controls}"] \\
\{\,\} \arrow[d, "\text{from}"] \\
\textbf{Control} \text{ valid, dirty, …}
\end{tikzcd}$$

DEMO

LAB

Custom Validators

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Directives

- Add behaviour to a component or any other HTML tag

- Built in examples
  - Attribute directives: ngModel, ngClass, ngStyle
  - Structural directives: *ngIf, *ngFor, *ngSwitch

- Custom attribute directives
  - E.g. validation directive

- No template (in contrast to components)

Validation directive

```
<input [(ngModel)]="from" name="from" city>
```

Validation directive

```
@Directive({
    selector: 'input[city]'
})
export class CityValidatorDirective implements Validator {
    validate(c: AbstractControl): ValidationErrors | null {
        const value = c.value;

        […]

        if (…) return { city: true }; // error

        return null; // no error
    }
}
```

Validation directive

```
@Directive({
    selector: 'input[city]',
    providers: [{ provide: NG_VALIDATORS,
                  useExisting: CityValidatorDirective,
                  multi: true }]
})
export class CityValidatorDirective implements Validator {
    validate(c: AbstractControl): ValidationErrors | null {
        const value = c.value;

        […]

        if (…) return { city: true };

        return null; // no error
    }
}
```

.errors[‘city’]

Using parameter

```
<input [(ngModel)]="from" name="from"
          [city]="['Graz', 'Hamburg', 'Zürich']">
```

Using parameter

```
@Directive({
    selector: 'input[city]',
    providers: [{ provide: NG_VALIDATORS,
                  useExisting: CityValidatorDirective,
                  multi: true }]
})
export class CityValidatorDirective implements Validator {

    @Input() city: string[] = [];

    validate(c: AbstractControl): ValidationErrors | null {
        […]
    }
}
```

Using parameters

```
@Directive({
    selector: 'input[city]',
    providers: [{ provide: NG_VALIDATORS,
                  useExisting: CityValidatorDirective,
                  multi: true }]
})
export class CityValidatorDirective implements Validator {

    @Input() city: string[] = [];
    @Input() cityStrategy = '';

    validate(c: AbstractControl): ValidationErrors | null {
        […]
    }
}
```

Using parameters

```
<input [(ngModel)]="from" name="from"
        [city]="['Graz', 'Hamburg', 'Zürich']" cityStrategy="strict">
```

DEMO

Asynchronous validation directives

```
@Directive({
    selector: 'input[asyncCity]',
    providers: [ … ]
})
export class AsyncCityValidatorDirective implements AsyncValidator {
    validate(control: AbstractControl): Observable<ValidationErrors | null> {
        […]
    }
}
```

Asynchronous validation directives

Token: NG_ASYNC_VALIDATORS

DEMO

Multifield Validators

```
@Directive({
    selector: 'form[roundTrip]',
    providers: [ … ]
})
export class RoundTripValidatorDirective implements Validator {
    validate(control: AbstractControl): ValidationErrors | null {
        […]
    }
}
```

Multifield Validators

```
export class RoundTripValidatorDirective implements Validator {
    validate(control: AbstractControl): ValidationErrors | null {
        const form = control as FormGroup;

        const from = form.controls['from'];
        const to = form.controls['to'];

        if (!from || !to) {
            return null;
        }

        […]
}
```

Multifield Validators

```
export class RoundTripValidatorDirective implements Validator {
    validate(control: AbstractControl): ValidationErrors | null {
        const group = control as FormGroup;

        const from = group.controls['from'];
        const to = group.controls['to'];

        if (!from || !to) return null;

        if (from.value && from.value === to.value) return { roundTrip: true };

        return null;
    }
}
```

DEMO

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