

Present and Future of Angular with Ivy



Template
Compiler

Gen



ViewEngine

Gen



Ivy

Gen



Ivy is an **enabler**

“



Design Goals

OPTIMIZABILITY

- Only pay for what you use
- Tree Shaking
- No metadata files
- Smaller bundles

INCREMENTALITY

- Locality
- Faster compilation, builds, & test execution

FLEXIBILITY

- Simple & easier to pick, understand, & debug
- HoC
- Module-less Apps
- Dynamic Component Loading

```
export function @@elementStart(..) {...}
export function @@text(..) {...}
export function @@template(..) {...}
...
});
}
```

Rendering Engine

```
AppComponent.ngComponentDef = i0.ɵɵdefineComponent({
  ...
  template: function AppComponent_Template(rf, ctx) {
    if (rf & 1) {
      i0.ɵɵelementStart(0, "div");
      i0.ɵɵtext(2);
      i0.ɵɵtemplate(3, AppComponent_child_cmp_3_Template, 1, 0, "child-cmp",
        _c0); i0.ɵɵelementEnd();
    } if (rf & 2) {
      i0.ɵɵselect(2);
      i0.ɵɵtextBinding(2, i0.ɵɵinterpolation1("", ctx.title, ""));
      i0.ɵɵselect(3);
      i0.ɵɵproperty("ngIf", ctx.show);
    }
  },
  ...
});
```

Template

`export function ɵɵelementStart(..) {...}`

`export function ɵɵtext(..) {...}`

`export function ɵɵtemplate(..) {...}`

...

Unused Ivy Instructions

Tree Shaken

Rendering Engine



Ivy Instruction Set

- ◉ DOM Creation
- ◉ Data Binding
- ◉ Change Detection
- ◉ I18N
- ◉ Queries
- ◉ Dependency Injection
- ◉ Styling
- ◉ Containers
- ◉ Templates
- ◉ Content Projection
- ◉ Pipes
- ◉ SVG

EXPLORER: WITHOUTIVY

- out-tsc
 - app
 - node_modules
 - src
 - app
 - child
 - child.component.js
 - child.component.js.map
 - child.component.metadata.json
 - child.component.ngfactory.js
 - child.component.ngfactory.js.map
 - child.component.ngsummary.json
 - child.component.scss.shim.ngstyle.js
 - child.component.scss.shim.ngstyle.js.map
 - app.component.js
 - app.component.js.map
 - app.component.metadata.json
 - app.component.ngfactory.js
 - app.component.ngfactory.js.map
 - app.component.ngsummary.json
 - app.component.scss.shim.ngstyle.js
 - app.component.scss.shim.ngstyle.js.map
 - app.module.js
 - app.module.js.map
 - app.module.metadata.json
 - app.module.ngfactory.js
 - app.module.ngfactory.js.map
 - app.module.ngsummary.json
 - environments







PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

1: cmd

```
C:\Development\Angular\withoutivy>c:\Development\Angular\withoutivy\node_modules\.bin\ngc -p tsconfig.ap  
p.json
```

```
C:\Development\Angular\withoutivy>
```


EXPLORE...    

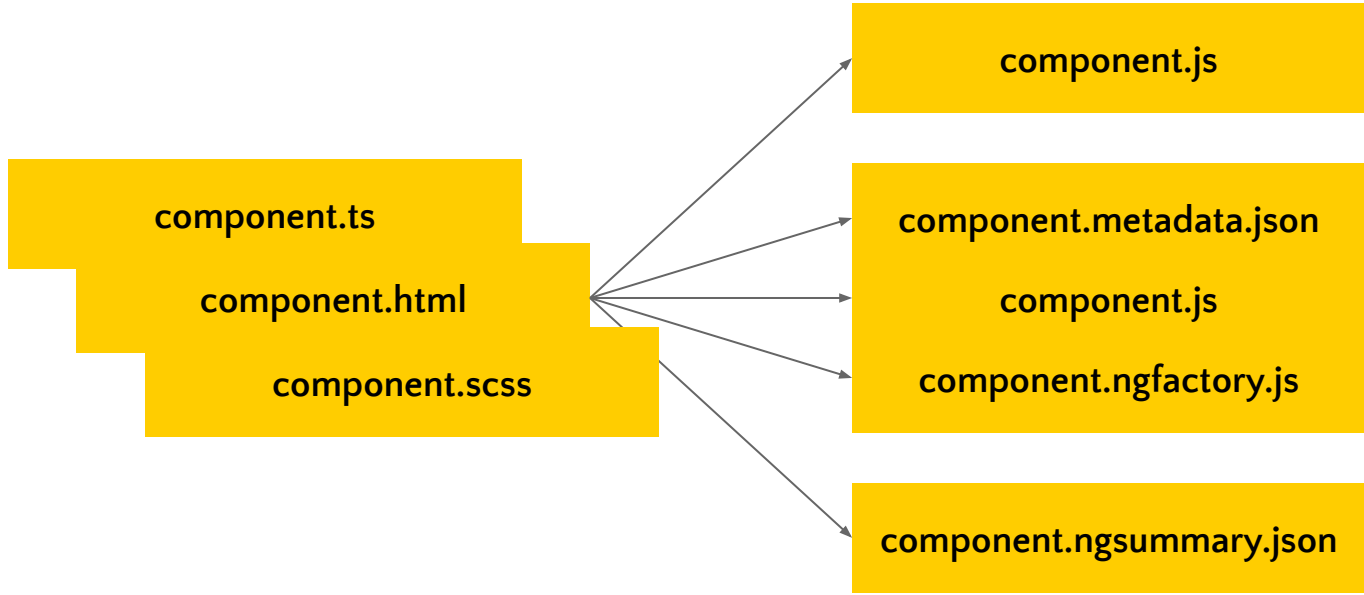
- out-tsc
 - app
 - src
 - app
 - child
 - JS child.component.js
 - JS child.component.js.map
 - JS app.component.js
 - JS app.component.js.map
 - JS app.module.js
 - JS app.module.js.map
 - > environments
 - JS main.js
 - JS main.js.map
 - JS polyfills.js
 - JS polyfills.js.map
 - src
 - .angulardoc.json U
 - editorconfig



PROBLEMS TERMINAL ... 1: cmd

```
C:\Development\Angular\withivy>node_modules\.bin\ngc -p tsconfig.app.json
```

```
C:\Development\Angular\withivy>
```







```
function View_AppComponent_0(_l) {
  return jit_viewDef_1(0,[_l()(),jit_elementDef_2(0,0,null,null,4,'div',[],null,null,
    null,null,null)),(_l()(),jit_elementDef_2(1,0,null,null,1,'span',[],null,null,
    null,null,null)),(_l()(),jit_textDef_7(2,null,['',''])),(_l()
  ()),jit_anchorDef_8(16777216,
    null,null,1,null,View_AppComponent_1)),jit_directiveDef_5(4,16384,null,0,jit_NgIf_9,
    [jit_ViewContainerRef_10,jit_TemplateRef_11],{ngIf:[0,'ngIf']},null)],function(_ck,
    _v) {
  var _co = _v.component;
  var currVal_1 = _co.show;
  _ck(_v,4,0,currVal_1);
},function(_ck,_v) {
  var _co = _v.component;
  var currVal_0 = _co.title;
  _ck(_v,2,0,currVal_0);
});
}
```

```

*
* @ngModule CommonModule
* @publicApi
*/
@Directive({selector: '[ngIf]'})
export class NgIf {
  private _context: NgIfContext = new NgIfContext();
  private _thenTemplateRef: TemplateRef<NgIfContext> | null = null;
  private _elseTemplateRef: TemplateRef<NgIfContext> | null = null;
  private _thenViewRef: EmbeddedViewRef<NgIfContext> | null = null;
  private _elseViewRef: EmbeddedViewRef<NgIfContext> | null = null;

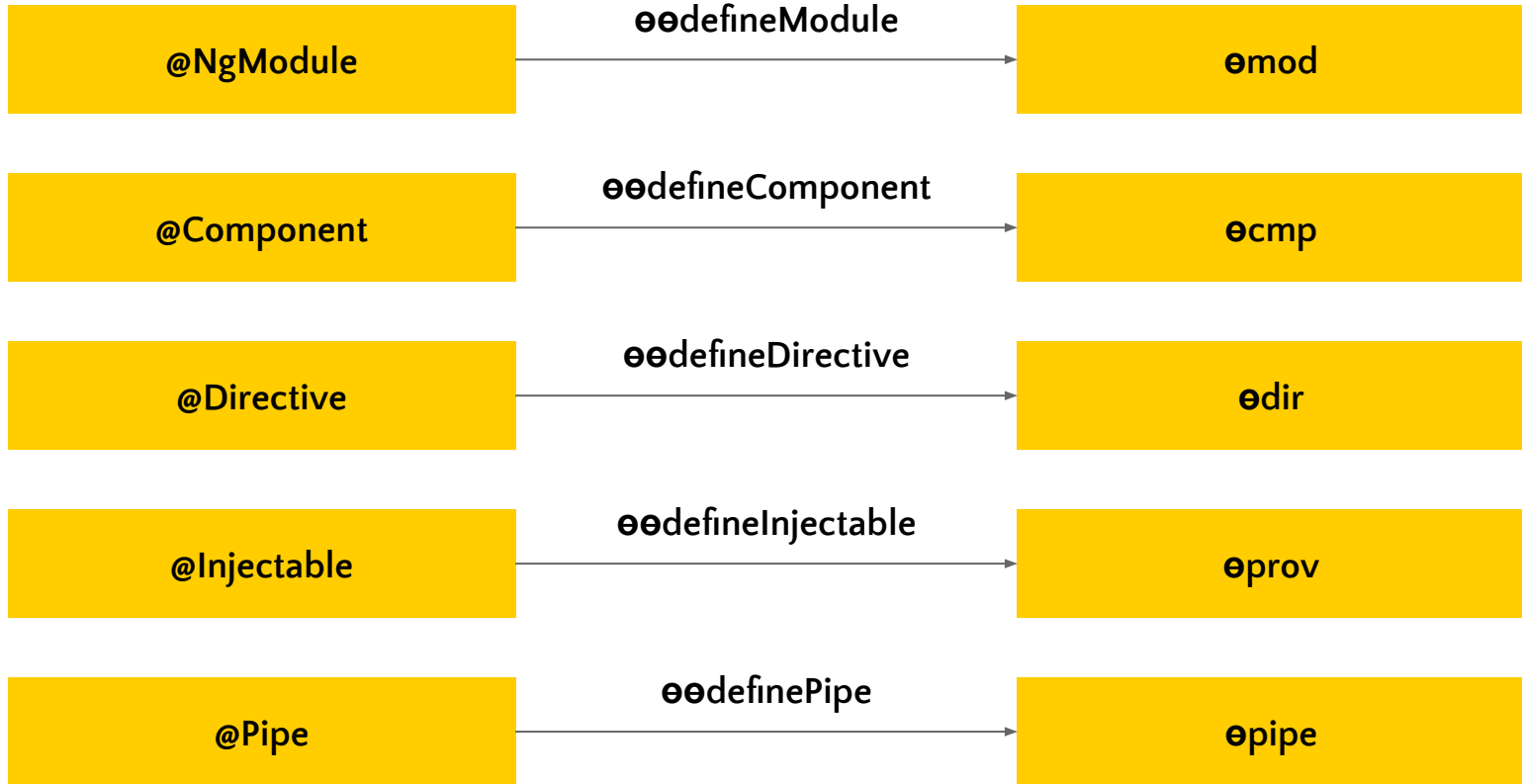
  constructor(private _viewContainer: ViewContainerRef, templateRef: TemplateRef<NgIfContext>) {
    this._thenTemplateRef = templateRef;
  }

  /**
   * The Boolean expression to evaluate as the condition for showing a template.
   */
  @Input()
  set ngIf(condition: any) {

```

```
import { @ɵdefineComponent, @ɵtextInterpolate1, @ɵelementStart, @ɵelementEnd, @ɵtext,
@ɵrenderComponent, @ɵadvance, @ɵlistener, @ɵmarkDirty, @ɵdetectChanges, @ɵRenderFlags
} from "@angular/core";

function ChildComponentTemplate(renderFlag, context) {
  (renderFlag === 1) && @ɵelement(0, 'child-cmp');
}
export class AppComponent { ... }
AppComponent.ɵfac = (t) => new (t || AppComponent)();
AppComponent.ɵcmp = @ɵdefineComponent({
  type: AppComponent,
  selectors: [['app-root']],
  decls: 4,
  vars: 2,
  consts: [[4, 'ngIf']],
  template: (renderFlag, context) { if (renderFlag === 1) {
    i0.ɵelementStart(0, 'div');
    i0.ɵelementStart(1, 'span');
    i0.ɵtext(2);
    i0.ɵelementEnd();
    i0.ɵɵtemplate(3, ChildComponentTemplate, 1, 0, 'child-cmp', 0);
    i0.ɵelementEnd();
  }
  if (renderFlag === 2) {
    i0.ɵadvance(2);
    i0.ɵtextInterpolate(ctx.title);
    i0.ɵadvance(1);
    i0.ɵɵproperty('ngIf', ctx.show);
  }
},
  directives: [i1.NgIf, i2.ChildComponent],
  styles: [''],
});
```





Ivy FTW - SIDDHARTH AJMERA



Design Goals

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- ◉ Only pay for what you use
- ◉ No metadata files
- ◉ Tree Shaking
- ◉ Smaller bundles

INCREMENTALITY

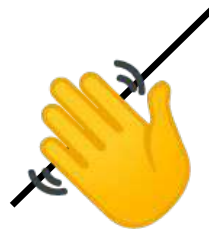
- ◉ Locality
- ◉ Faster compilation, builds, & test execution

FLEXIBILITY

- ◉ Module-less Apps
- ◉ Simple & easier to pick, understand, & debug
- ◉ Dynamic Component Loading
- ◉ HoC



Hello World!



I am **Siddharth Ajmera**

FullStack JS Developer

Angular 

Writer 

Instructor   Udemy



PRESENT

A few examples to demonstrate how awesome Ivy is

1

Small & Meaningful Stacktraces

To get you straight to the source of your error.

2

AoT by default

So that you can see the error right while developing

3

Lazy Loading Components

So that you can load components lazily and only when required.

4

ng Object for

So that you can debug your code more easily at runtime



FUTURE

A few examples to demonstrate how Ivy enables the awesome future

*Angular Modules are linchpins in
an Angular Application*



“

1

Render Components without Angular Modules **from Scratch**

To write Angular Component from Scratch without much dependency on Angular Modules, ZoneJS etc.

2

Render Components without Angular Modules **via Compiler**

As you might not want to write the whole boilerplate again and again.

3

Dynamically Loading a Lazy Component with Ivy's `renderComponent`

To give you the flexibility to load a Component lazily and dynamically

4

DI in a Dynamically Loaded Lazy Component

Coz what's an Angular App without DI?

Angular Ivy



Martina Kraus



Siddharth Ajmera



@SiddAjmera

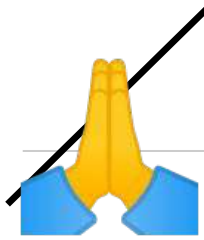


WHERE FROM HERE?

Into a world of Angular Apps where things like Angular Modules, ZoneJS, and RxJS is optional



Thanks!



Any **questions** ?

You can find me at

- ◉ **@SiddAjmera**
- ◉ **SiddAjmera.DEV**



Credits

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by [SlidesCarnival](#)
- Photographs by [Unsplash](#)