

IVY IS ~~COMING~~

Here





NGULARJS



Ivy is HERE



@eliraneliassy

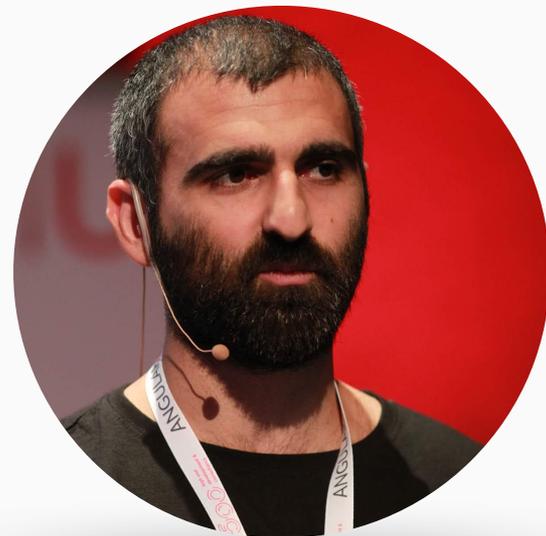


About mySelf

- Experienced FE developer, specialised in B2C applications
- Founder & developer @ e-square.io
- Angular-IL & AngularUP conf CO-organiser
- Writer for AngularInDepth



Angular In Depth



Building powerful Angular community

ANGULAR
CONFERENCE | UP



meetup

Angular Ivy

Flashback

v2

Template

Compiler

v4

View

Engine

v8

Ivy

Why Ivy?



**63% of all US online traffic
comes from smartphones and
tablets.**

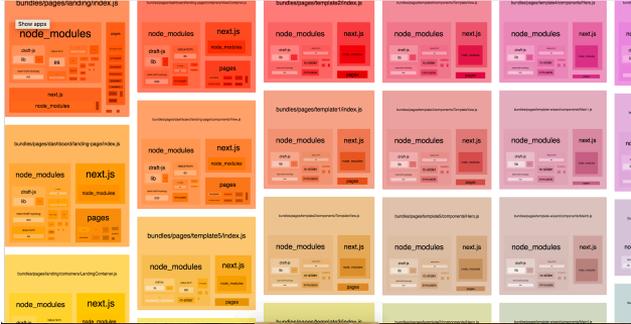
**Nearly 80% of internet usage
is expected to have been
mobile in 2019**

What can we do?

CDN



Lazy loading



PWA



Reduce the bundle!

Eliran Eliassy

Hi, I'm Eliran Eliassy!



I'm an experienced FE developer, specialized in B2C applications.
FE developer & trainer @ 500Tech

Angular enthusiastic, Public speaker, Community leader.
Co-Organiser @ AngularUP Annual Conference
Co-Organiser and manager @ Angular-IL meetup

Sessions

Upcoming

Browser tabs: Eliran Eliassy - Angular Consul

Address bar: https://eliassy.dev

Navigation: Elements, Console, Sources, **Network**, Performance, Memory

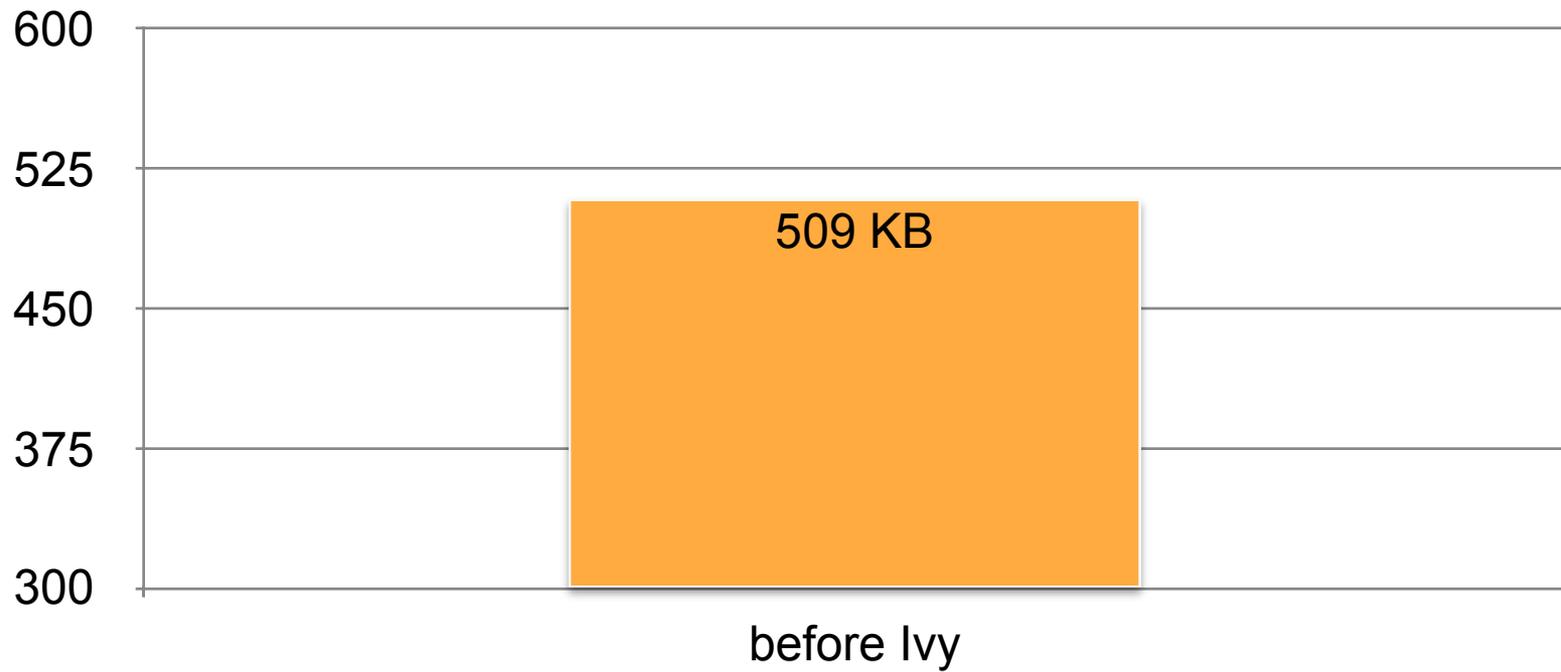
Filter: Hide data URLs

View: Group by frame, Preserve log, Disable cache, Offline

Timeline: 500 ms, 1000 ms, 1500 ms, 2000 ms, 2500 ms, 3000 ms

Name	Status	Type	Initiator	Size	Ti...	Waterfall
js?id=UA-139193882-1	200	script	(index)	(ServiceWorker)	25...	
runtime-es2015.858f8dd898b75...	200	script	(index)	(ServiceWorker)	25...	
polyfills-es2015.d19b9787007d...	200	script	(index)	(ServiceWorker)	25...	
main-es2015.041312915d7fb7d...	200	script	(index)	(ServiceWorker)	25...	
gtm.js?id=GTM-WS5HBWS	404	script	(index):12	(ServiceWorker)	43...	
analytics.js	200	script	js?id=U...	(ServiceWorker)	6 ...	
ng-validate.js	200	script	content...	(ServiceWorker)	8 ...	

7 / 48 requests 0 B / 55.9 KB transferred 634 KB / 2.2 MB resources Finish: 2.51 s DOMContentLoaded: 59



Opt-in Ivy

tsconfig.app.json

```
{
  "extends": "../tsconfig.json",
  "compilerOptions": {
    "outDir": "../out-tsc/app",
    "types": []
  },
  "exclude": [
    "test.ts",
    "**/*.spec.ts"
  ]
}
```

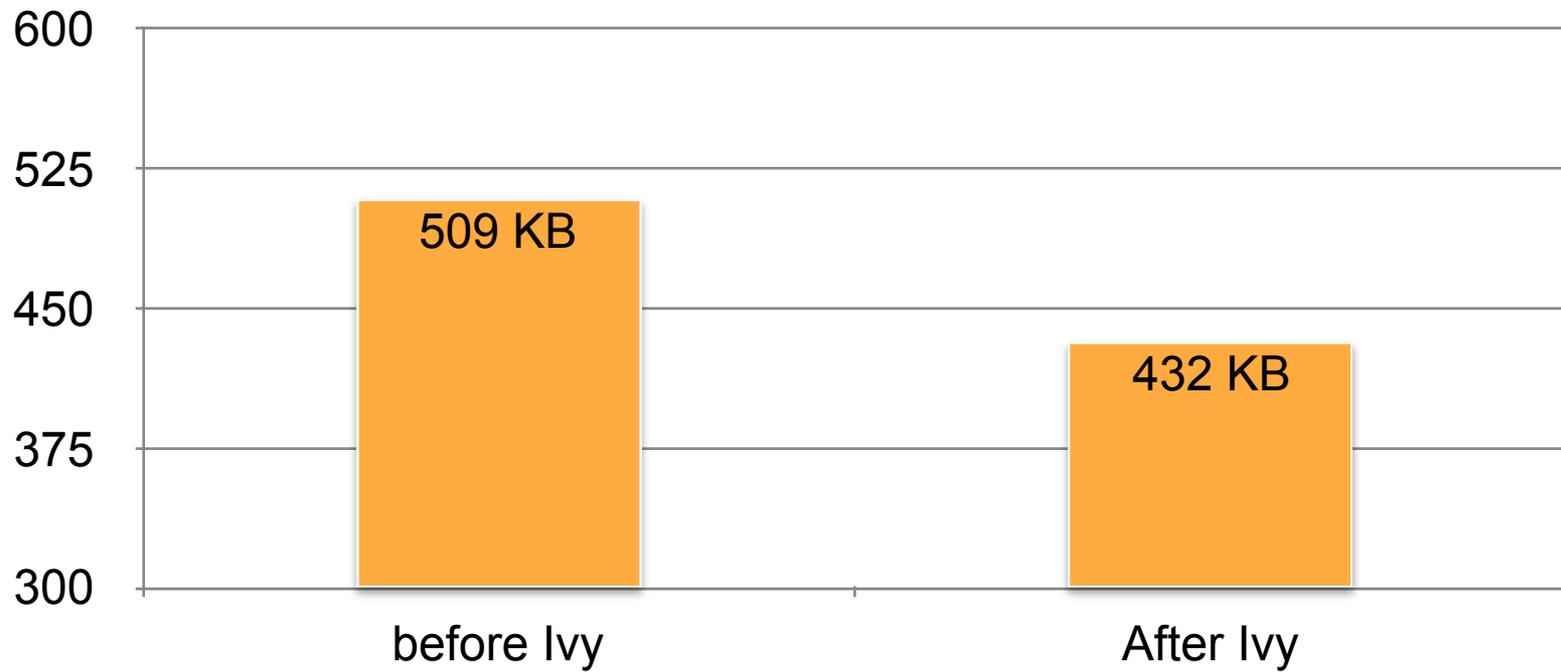


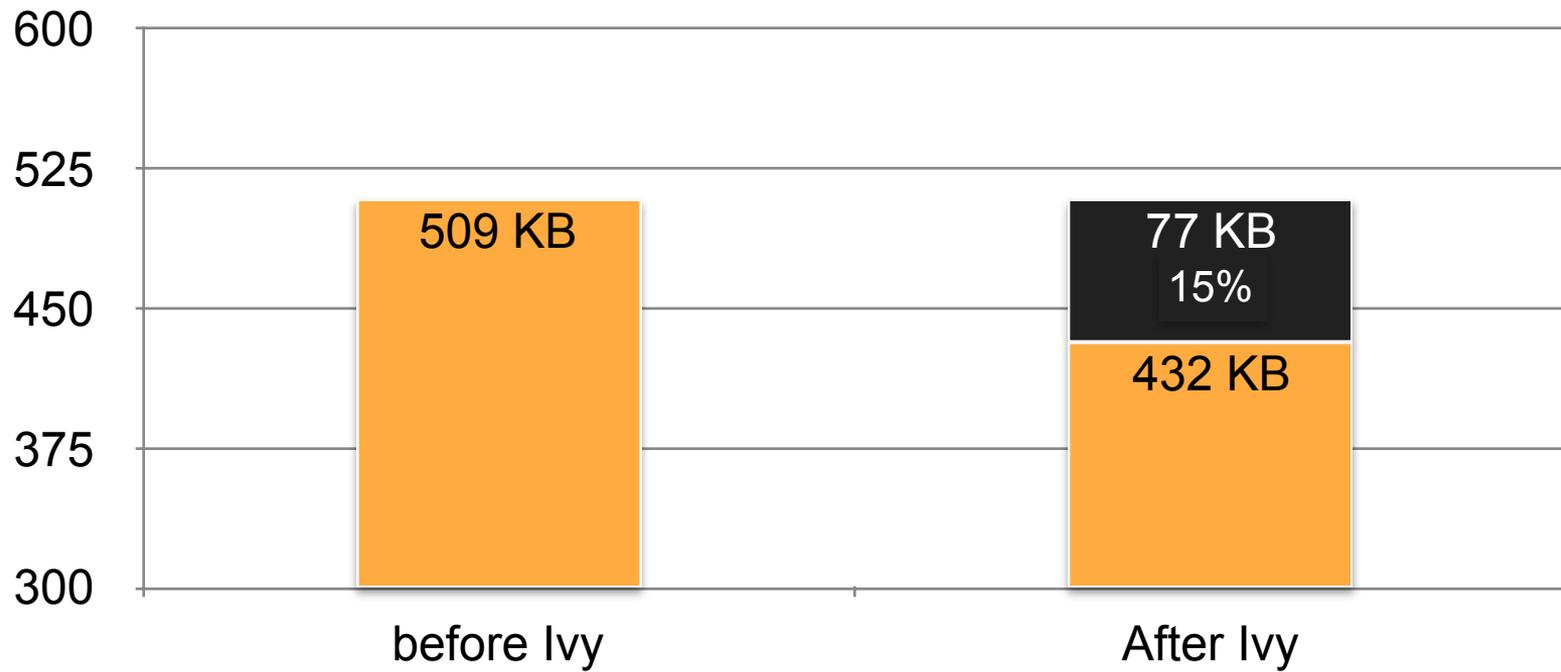
Opt-in Ivy

tsconfig.app.json

```
{
  "extends": "../tsconfig.json",
  "compilerOptions": {
    "outDir": "../out-tsc/app",
    "types": []
  },
  "exclude": [
    "test.ts",
    "**/*.spec.ts"
  ],
  "angularCompilerOptions": {
    "enableIvy": true
  }
}
```







How does it work?

How does it work?

```
<div>  
  <span>{{title}}</span>  
  <app-child *ngIf="show"></app-child>  
</div>
```



Demo 1

Use the *ngc* command to generate the transpiled code

```
$ node_modules/.bin/ngc
```

No more factory files!

The factory became a static method inside the component def

All Angular decorators now have their static function inside the component class:

@Component → ngComponentDef

@Injectable → ngInjectableDef

@Directive → ngDirectiveDef

Transpiled code - View Engine

```
export function View_AppComponent_0(_l) {
  return i1.ɵvid(0, [
    (_l())(), i1.ɵeld(0, 0, null, null, 4, "div", [], null, null, null, null, null)),
    (_l())(), i1.ɵeld(1, 0, null, null, 1, "span", [], null, null, null, null, null)),
    (_l())(), i1.ɵted(2, null, ["" , ""])),
    (_l())(), i1.ɵand(16777216, null, null, 1, null, View_AppComponent_1)),
    i1.ɵdid(4, 16384, null, 0, i4.NgIf, [i1.ViewContainerRef, i1.TemplateRef],
      { 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);
    });
  });
}
```



Transpiled code - Ivy

```
template: function AppComponent_Template(rf, ctx) {  
  if (rf & 1) {  
    i0.ɵɵelementStart(0, "div");  
    i0.ɵɵelementStart(1, "span");  
    i0.ɵɵtext(2);  
    i0.ɵɵelementEnd();  
    i0.ɵɵtemplate(3, AppComponent_app_child_3_Template, 1, 0, "app-child", _c0);  
    i0.ɵɵelementEnd();  
  } if (rf & 2) {  
    i0.ɵɵselect(2);  
    i0.ɵɵtextBinding(2, i0.ɵɵinterpolation1("", ctx.title, ""));  
    i0.ɵɵselect(3);  
    i0.ɵɵproperty("ngIf", ctx.show);  
  }  
}
```



Tree Shaking



Bundle size reduced



Transpiled code - View Engine

```
export function View_AppComponent_0(_l) {
  return i1.ɵvid(0, [
    (_l())(), i1.ɵeld(0, 0, null, null, 4, "div", [], null, null, null, null, null)),
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    (_l())(), i1.ɵted(2, null, ["" , ""])),
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    i1.ɵdid(4, 16384, null, 0, i4.NgIf, [i1.ViewContainerRef, i1.TemplateRef],
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      var _co = _v.component; var currVal_0 = _co.title; _ck(_v, 2, 0, currVal_0);
    });
}
```



Transpiled code - View Engine

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export function View_AppComponent_0(_l) {
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    function (_ck, _v) {
      var _co = _v.component; var currVal_0 = _co.title; _ck(_v, 2, 0, currVal_0);
    });
}
```



ng_if.ts

```
@Directive({ selector: '[ngIf]' })  
export class NgIf {  
  
    constructor(  
        private _viewContainer: ViewContainerRef,  
        templateRef: TemplateRef<NgIfContext>) {  
        this._thenTemplateRef = templateRef;  
    }  
    ...  
}
```



Transpiled code - Ivy

```
template: function AppComponent_Template(rf, ctx) {  
  if (rf & 1) {  
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    i0.ɵɵelementStart(1, "span");  
    i0.ɵɵtext(2);  
    i0.ɵɵelementEnd();  
    i0.ɵɵtemplate(3, AppComponent_app_child_3_Template, 1, 0, "app-child", _c0);  
    i0.ɵɵelementEnd();  
  } if (rf & 2) {  
    i0.ɵɵselect(2);  
    i0.ɵɵtextBinding(2, i0.ɵɵinterpolation1("", ctx.title, ""));  
    i0.ɵɵselect(3);  
    i0.ɵɵproperty("ngIf", ctx.show);  
  }  
}
```



Transpiled code - Ivy

```
template: function AppComponent_Template(rf, ctx) {
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    i0.ɵɵelementEnd();
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    i0.ɵɵselect(2);
    i0.ɵɵtextBinding(2, i0.ɵɵinterpolation1("", ctx.title, ""));
    i0.ɵɵselect(3);
    i0.ɵɵproperty("ngIf", ctx.show);
  }
}
```



Bundle size reduced



Faster Compilation



Easier to debug

Demo 2

Debugging with Ivy

Debugging

```
<input (input)="search($event)">
```

```
export class AppComponent {  
  title = 'angular-ivy-lazy-hoc-talk';  
  show: boolean;  
}
```



Debugging with View Engine

```
<input (input)="search($event)">
```

```
✘ ▶ ERROR TypeError: _co.search is not a function
    at Object.eval [as handleEvent] (AppComponent.html:5)
    at handleEvent (core.js:34782)
    at callWithDebugContext (core.js:36400)
    at Object.debugHandleEvent [as handleEvent] (core.js:36036)
    at dispatchEvent (core.js:22531)
    at core.js:33714
    at HTMLInputElement.<anonymous> (platform-browser.js:1789)
    at ZoneDelegate.invokeTask (zone-evergreen.js:391)
    at Object.onInvokeTask (core.js:30878)
    at ZoneDelegate.invokeTask (zone-evergreen.js:390)
```

AppComponent.html:5



Debugging with Ivy

```
<input (input)="search($event)">
```

- 3 ▼ ERROR TypeError: ctx.search is not a function
 - at AppComponent_Template_input_input_0_listener (template.html:5)
 - at executeListenerWithErrorHandling (core.js:16065)
 - at wrapListenerIn_markDirtyAndPreventDefault (core.js:16100)
 - at HTMLInputElement.<anonymous> (platform-browser.js:1803)
 - at ZoneDelegate.invokeTask (zone-evergreen.js:391)
 - at Object.onInvokeTask (core.js:30886)
 - at ZoneDelegate.invokeTask (zone-evergreen.js:390)
 - at Zone.runTask (zone-evergreen.js:168)
 - at ZoneTask.invokeTask [as invoke] (zone-evergreen.js:465)
 - at invokeTask (zone-evergreen.js:1603)



Bundle size reduced



Faster Compilation



Better template debugging



Dynamic loading

Demo 3

Dynamic Loading



EXPLORER

OPEN EDITORS

ANGULAR-IVY-HOC-TALK

src

app

feature

feature

feature.component.html

feature.component.scss

feature.component.spec.ts

feature.component.ts

feature-routing.module.ts

feature.module.ts

app-routing.module.ts

app.component.html

app.component.scss

app.component.spec.ts

app.component.ts

app.module.ts

assets

environments

favicon.ico

index.html

main.ts

polyfills.ts

styles.scss

OUTLINE

app.component.html

src > app > app.component.html > ...

```

1 <button routerLink="/feature">Click Me</button>
2 <router-outlet></router-outlet>
3

```

PROBLEMS OUTPUT TERMINAL

```

4 unchanged chunks
chunk {feature-feature-module} feature-feat
ure-module.js, feature-feature-module.js.ma
p (feature-feature-module) 6.19 kB [render
ed]
chunk {main} main.js, main.js.map (main) 10
.7 kB [initial] [rendered]
chunk {runtime} runtime.js, runtime.js.map
(runtime) 8.79 kB [entry] [rendered]
i [wdm]: Compiled successfully.

```

1: node, zsh

```

→ angular-ivy-hoc-talk git:(master) x node
_modules/ngc -p tsconfig.app.json
zsh: no such file or directory: node_module
s/ngc
→ angular-ivy-hoc-talk git:(master) x node
_modules/.bin/ngc -p tsconfig.app.json
→ angular-ivy-hoc-talk git:(master) x node
_modules/.bin/ngc -p tsconfig.app.json
→ angular-ivy-hoc-talk git:(master) x node
_modules/.bin/ngc -p tsconfig.app.json
→ angular-ivy-hoc-talk git:(master)

```

Bundle size reduced



Faster Compilation



Better template debugging



Better dynamic loading



HOC

A function which gets a component
and returns a component

And also affecting the component in between...

Demo 4

Experimental HOC

Bundle size reduced



Faster Compilation



Better template debugging



Better dynamic loading



Higher Order Components



Summary

- Ivy - 3rd generation of Angular compiler is around the corner!
 - Backwards compatible
 - With Ivy:
 - Small bundles
 - Easier to debug
 - Faster compilations
 - Easier dynamic loading of modules & components
 - Future of Angular: HOC, Angular Elements and more!
-



Eliran Eliassy

@EliranEliassy



@eliraneliassy

I thought that the best way for getting ready for my talk on [@angularup](#) will be writing a blog post about it.

It's quite long but covers everything I find interesting in Angular Ivy.

Enjoy!



All you need to know about Ivy, The new Angular engine!

Smaller bundles. faster compilations. Better debugging. dynamic loading of

<http://bit.ly/all-you-need-to-know-angular-ivy>

2:09 AM - 10 Jun 2019

Thank You

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