boliga.dk performance

express middleware

- each request is run through ~200 regex tests
- not needed for static files
- not needed for valid urls

quick fix

- load middleware after static files

complete fix

- remove middleware
- extend angular 404 handler to test url

```
app.get('/app/info', (req: express.Request, res: express.Response) => {
  res.status(200).send({ url: environment.apiUrl });
});
// SEO sitemap
app.get('/sitemap/*', sitemap);
// custom landingPages
app.get('/boligadvokatkontoret', staticBoligadvokatkontoret );

// Server static files from /browser
if (appConfig.REQUESTLOG === 'all') {
  app.use(morgan(morganJsonFormat, morganConfig(appConfig.REQUESTLOGMINSTATUS)))
}
app.get('*.*', express.static(join(appConfig.CURR_FOLDER, 'browser')));

// Setup for handling non-static routes
app.engine('html', ngExpressEngine({
  bootstrap: AppServerModule
}));
app.set('view engine', 'html');
app.set('views', join(appConfig.CURR_FOLDER, 'browser'));
app.use(guidRedirecthandling());
app.use(newsStatsDataRedirecthandling());
app.use(redirecthandling(redirectRules));
app.use(lowercaseRedirecting());
app.use(redirectExcludedQueryParams());
app.use(NotFoundSeoRedirectHandling());

// All regular routes use the Universal engine
if (appConfig.REQUESTLOG === 'routes') {
  app.use(morgan(morganJsonFormat, morganConfig(appConfig.REQUESTLOGMINSTATUS)))
}
app.get('*', (req, res) => {
  res.render(join(appConfig.CURR_FOLDER, 'browser', 'index.html'), {
    req,
    res,
    providers: [
      {
        provide: 'REQUEST', useValue: (req)
      },
      {
        provide: 'RESPONSE', useValue: (res)
      }
    ],
  });
});
```

render blocking

- each script and css file in <head> blocks the page display
- external scripts & css moved to body with async tags
- preconnect tags added for API & image CDN

items moved to async (non blocking) loading:

- google tag manager
- facebook sdk
- cookie consent
- google fonts

```
<!doctype html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <meta name="description" content="">
  <meta name="keywords" content="">
  <title>Boliga</title>
  <base href="/">
  <meta name="viewport" content="width=device-width, initial-scale=
  <link rel="icon" type="image/x-icon" href="favicon.ico">
  <link rel="apple-touch-icon" sizes="180x180" href="/assets/apple-
  <link rel="icon" type="image/png" sizes="32x32" href="/assets/fav
  <link rel="icon" type="image/png" sizes="16x16" href="/assets/fav
  <link rel="manifest" href="/assets/site.webmanifest">
  <link rel="mask-icon" href="/assets/safari-pinned-tab.svg" color=
  <meta name="msapplication-TileColor" content="#da532c">
  <meta name="theme-color" content="#ffffff">
  <link rel="preconnect" href="https://api.boliga.dk">
  <link rel="preconnect" href="https://i.boliga.org">
  <!--[if IE]>
  <link href="https://fonts.googleapis.com/css?family=Montserrat:40
  <![endif]-->
</head>
<body>
  <app-root></app-root>
  <script>(function(w,d,s,l,i){w[l]=w[l]||[];w[l].push({'gtm.start'
    new Date().getTime(),event:'gtm.js'});var f=d.getElementsByTagN
    j=d.createElement(s),dl=l!='dataLayer'?'&l='+l:'';j.async=true;
    'https://www.googletagmanager.com/gtm.js?id='+i+dl;f.parentNode
    })(window,document,'script','dataLayer','GTM-PWD5VZT');
  </script>
  <script type="text/javascript" src="https://connect.facebook.net/
  <script id="CookieConsent" src="https://policy.app.cookieinformat
  <!--[if !IE]> -->
  <link href="https://fonts.googleapis.com/css?family=Montserrat:40
  <!-- <![endif]-->
</body>
</html>
```

font fallback

- no text displayed until fonts downloaded
- poor experience on slow connections
- pages fully visible with no text

fixed with fallback font display

- font-display: swap
- text visible while font is downloading
- once font is downloaded displayed font is updated

```
  font-family: 'PT Sans';
  src: local('PT Sans Bold'), local('PTSans-Bold'), url('fonts/PTSans-Bold.tt
  font-weight: bold;
  font-style: normal;
  font-display: swap;
}
@font-face {
  font-family: 'PT Sans';
  src: local('PT Sans Italic'), local('PTSans-Italic'), url('fonts/PTSans-Ita
  font-weight: normal;
  font-style: italic;
  font-display: swap;
}
@font-face {
  font-family: 'PT Sans';
  src: local('PT Sans Bold Italic'), local('PTSans-BoldItalic'), url('fonts/P
  font-weight: bold;
  font-style: italic;
  font-display: swap;
}
@font-face {
  font-family: 'PT Sans';
  src: local('PT Sans'), local('PTSans-Regular'), url('fonts/PTSans-Regular.t
  font-weight: normal;
  font-style: normal;
  font-display: swap;
}
/* Google Fonts - Libre Baskerville */
@font-face {
  font-family: 'Libre Baskerville';
  src: local('Libre Baskerville Bold'), local('LibreBaskerville-Bold'), url('
  font-weight: bold;
  font-style: normal;
  font-display: swap;
}
@font-face {
  font-family: 'Libre Baskerville';
  src: local('Libre Baskerville'), local('LibreBaskerville-Regular'), url('fo
  font-weight: normal;
  font-style: normal;
  font-display: swap;
}
@font-face {
  font-family: 'Libre Baskerville';
  src: local('Libre Baskerville Italic'), local('LibreBaskerville-Italic'), u
```

double startup

- loading app.module twice
- does not seem to be needed
- helps decrease mobile startup time

```
import { enableProdMode } from '@angular/core';
import { platformBrowserDynamic } from '@angular/platform-br

import { AppModule } from './app/app.module';
import { environment } from './environments/environment';

if (environment.production) {
  enableProdMode();
}

platformBrowserDynamic().bootstrapModule(AppModule)
  .catch(err => console.log(err));


// !!!! this triggers a full reload of './app/app.module' !
// document.addEventListener('DOMContentLoaded', () => {
//   platformBrowserDynamic()
//     .bootstrapModule(AppModule)
//     .catch(err => console.log(err));
// });
```

double nav bar

- two nav bars blue background & transparent background
- both layouts loaded for every single page
- only difference is a single css class

fixed with dynamic css class

- removed transparent nav bar references
- uses angular router data attribute
- active on routes that need transparent background

```
import { Component, OnInit } from '@angular/core';
import { ActivatedRoute } from '@angular/router';

@Component({
  selector: 'app-main-layout',
  templateUrl: './main-layout.component.html',
  styleUrls: ['./main-layout.component.scss']
})
export class MainLayoutComponent implements OnInit {

  transparent: boolean = false;

  constructor(private route: ActivatedRoute) { }

  ngOnInit(): void {
    this.transparent = this.route.snapshot.data['isHomepage'] || fals
  }
}
```

heavy app.module

- too many things loaded into main bundle
- does not use lazy loading
- needs to be as small as possible

quick fix

- comment out stuff that does not seem to be used
- load services/modules at component level when needed

complete fix

- review everything here and remove as much as possible

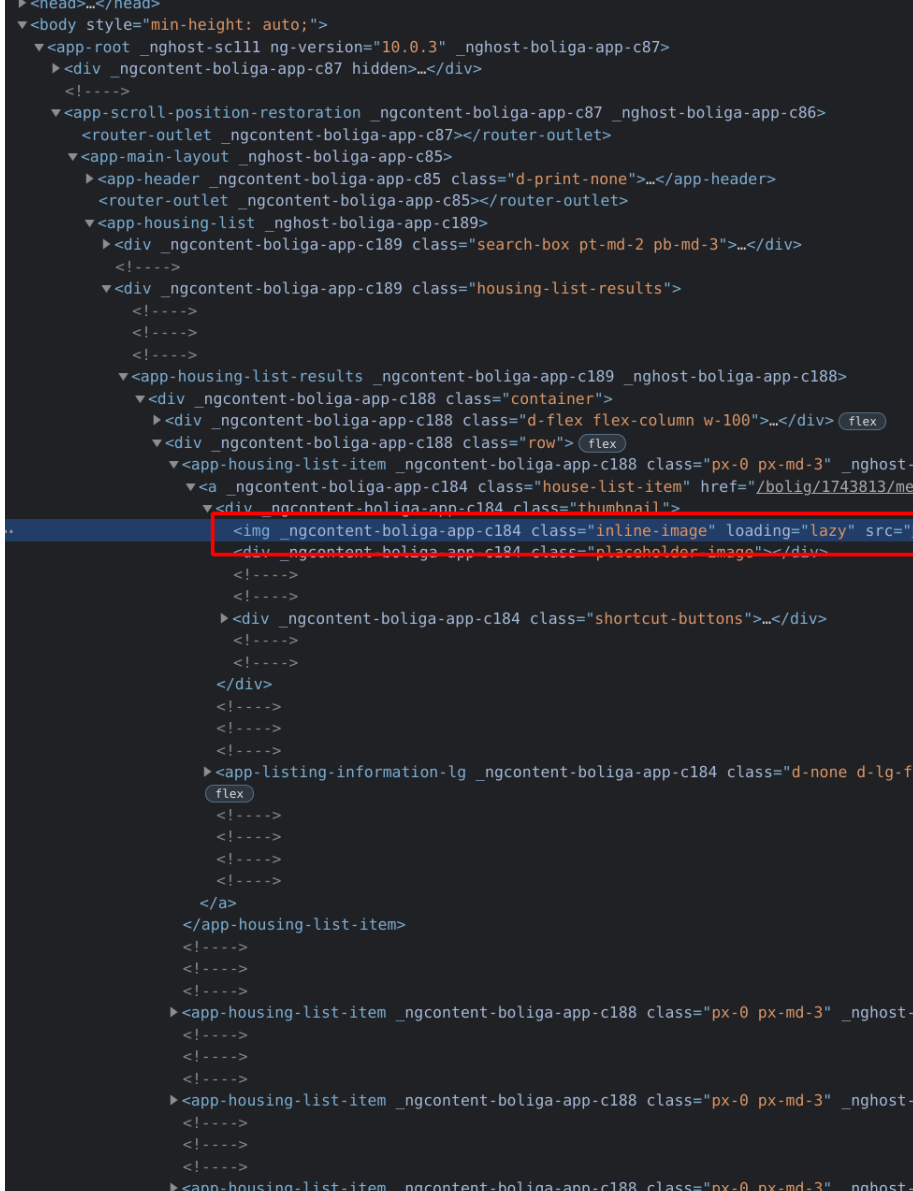
```
import { BrowserModule, BrowserTransferStateModule, TransferState, Ha
import { BrowserAnimationsModule } from '@angular/platform-browser/an
import { APP_ID, APP_INITIALIZER, ErrorHandler, Inject, Injector, LOC
import { isPlatformBrowser, LOCATION_INITIALIZED, registerLocaleData
import { MAT_DATE_LOCALE } from '@angular/material/core';
import { MAT_TOOLTIP_DEFAULT_OPTIONS, MatTooltipDefaultOptions } fro
import { HTTP_INTERCEPTORS, HttpClient, HttpClientModule } from '@ang
import { TranslateLoader, TranslateModule, TranslateService } from '@
import { TransferHttpCacheModule } from '@nguniversal/common';
import { InlineSVGModule } from 'ng-inline-svg';
import { CookieService } from 'ngx-cookie-service';
import { FacebookModule } from 'ngx-facebook';

import { TranslateBrowserLoader } from './core/translate/translate-br
import { AppRoutingModule } from './app-routing.module';
import { AppComponent } from './app.component';
import { AuthModule, PreRequestAuthInterceptor } from './core/auth';
import { LayoutModule } from './core/layout/layout.module';
// import { SearchModule } from './modules/search/search.module';
// import { SearchAutocompleteModule } from './modules/location-searc
// import { PopularCategoriesModule } from './modules/popular-categor
// import { BriefSiteStatisticsModule } from './modules/brief-site-st
// import { LoginModalModule } from './modules/login-modal/login-moda
import { GlobalErrorService } from './helper/global-error.service';

import da from '@angular/common/locales/da';
import { LinkService } from './helper/link.service';
import { LoggerModule, NgxLoggerLevel } from 'ngx-logger';
import { DEFAULT_TIMEOUT, TimeoutInterceptor, TIMEOUT_RULES } from '
import { SeoService } from './helper/seo.service';
// import { MapHelperService } from './helper/map-helpers.service';
import { GtmService } from './helper/gtm/gtm.service';
import { DataLayerService } from './helper/gtm/data-layer.service';
import { ListingDetailsService } from './helper/listing-details.servi
import { UtmService } from './helper/utm/utm.service';
import { Observable, combineLatest } from 'rxjs';
// import { HTMLMarkerPopupComponent } from './modules/visual-search/
import { ScrollPositionRestorationModule } from './core/scroll-positi
import { ServiceWorkerModule } from '@angular/service-worker';
import { environment } from '../environments/environment';
```

lazy image loading

- page does not wait for images to become 'ready'
- visible on screen images loaded first
- page scroll loads off screen images on demand
- built into browser - no script overhead

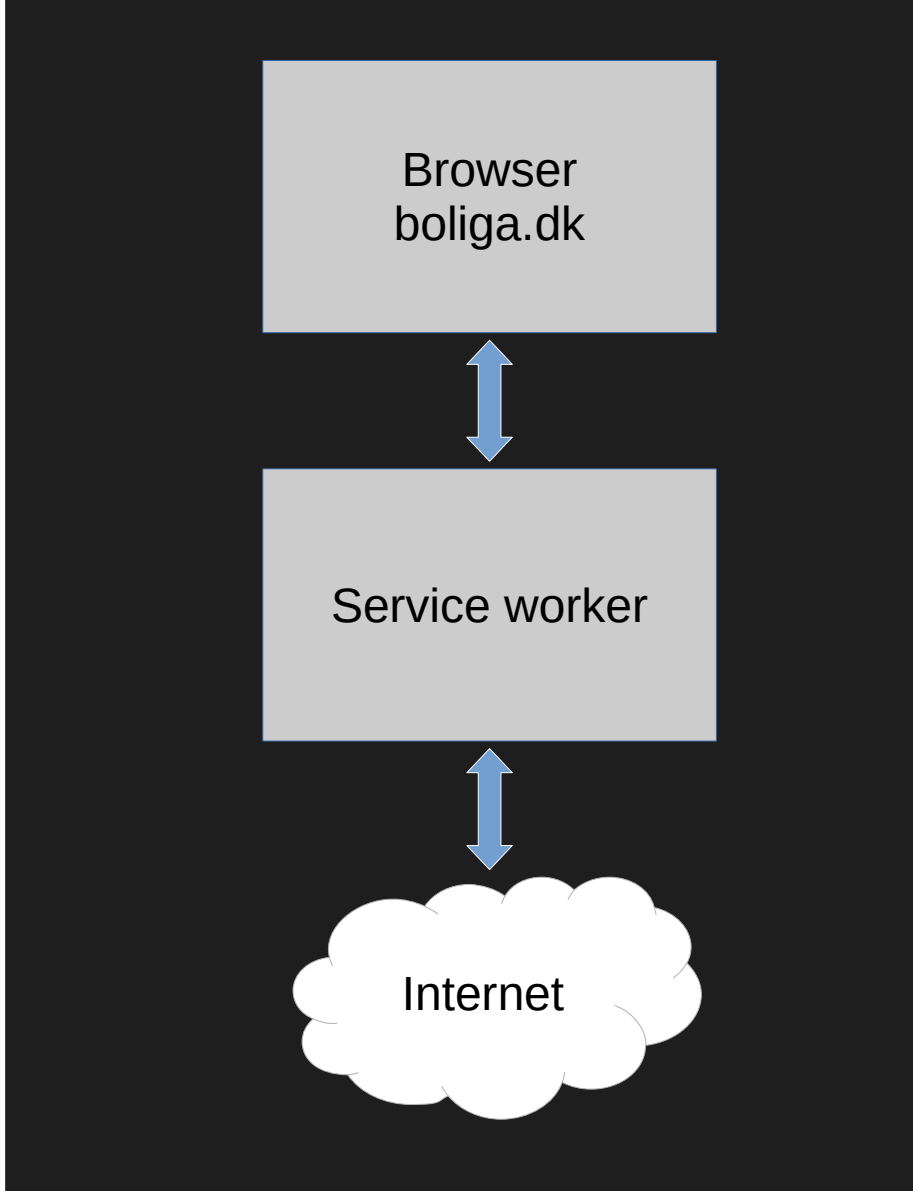
important:

- only works with <img> tag
- CSS background image not supported



service worker

- separate background worker
- handles advanced caching strategies
- list of files to cache generated at build time
- cache gets busted for changed files on deploy
- assists in caching external content (e.g. google fonts)
- built in failsafe - automatic uninstall
- instant network responses for slow mobile connections



change of design

- two large application design elements missing
- causing heavy slowdown in responses

server vs browser code split

- running unnecessary code on the server

server state transfer

- state is lost after SSR complete

server vs browser

- running unnecessary code on the server
- interactive elements (buttons, maps, dynamic ui elements, etc)
- global code hooks (browser scroll tracking, analytics, facebook, etc)

example; inspiration button

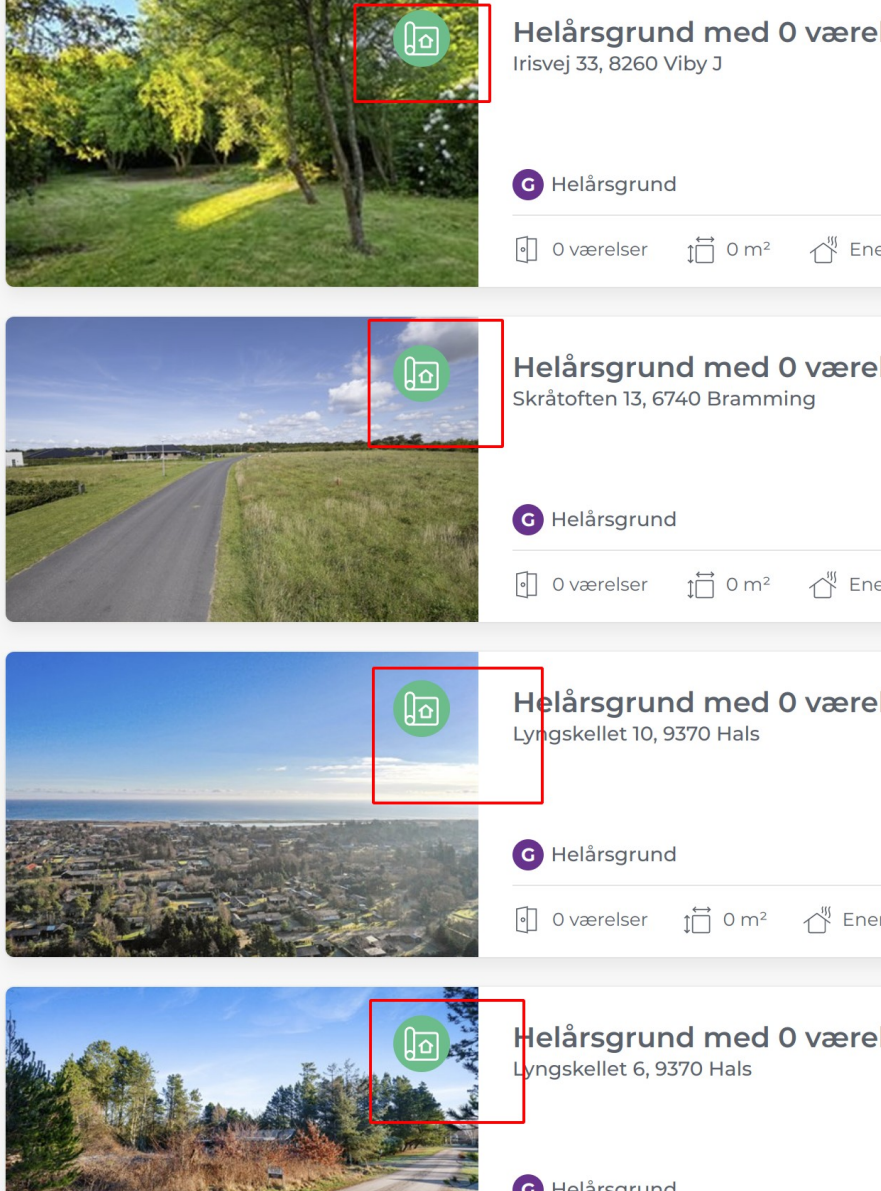
- extremely expensive to create
- triggers many API requests for results screen
- the server will not click the button
- google will not click the button
- only in the browser maybe the button is clicked

quick fix

- changed this button to only render on browser

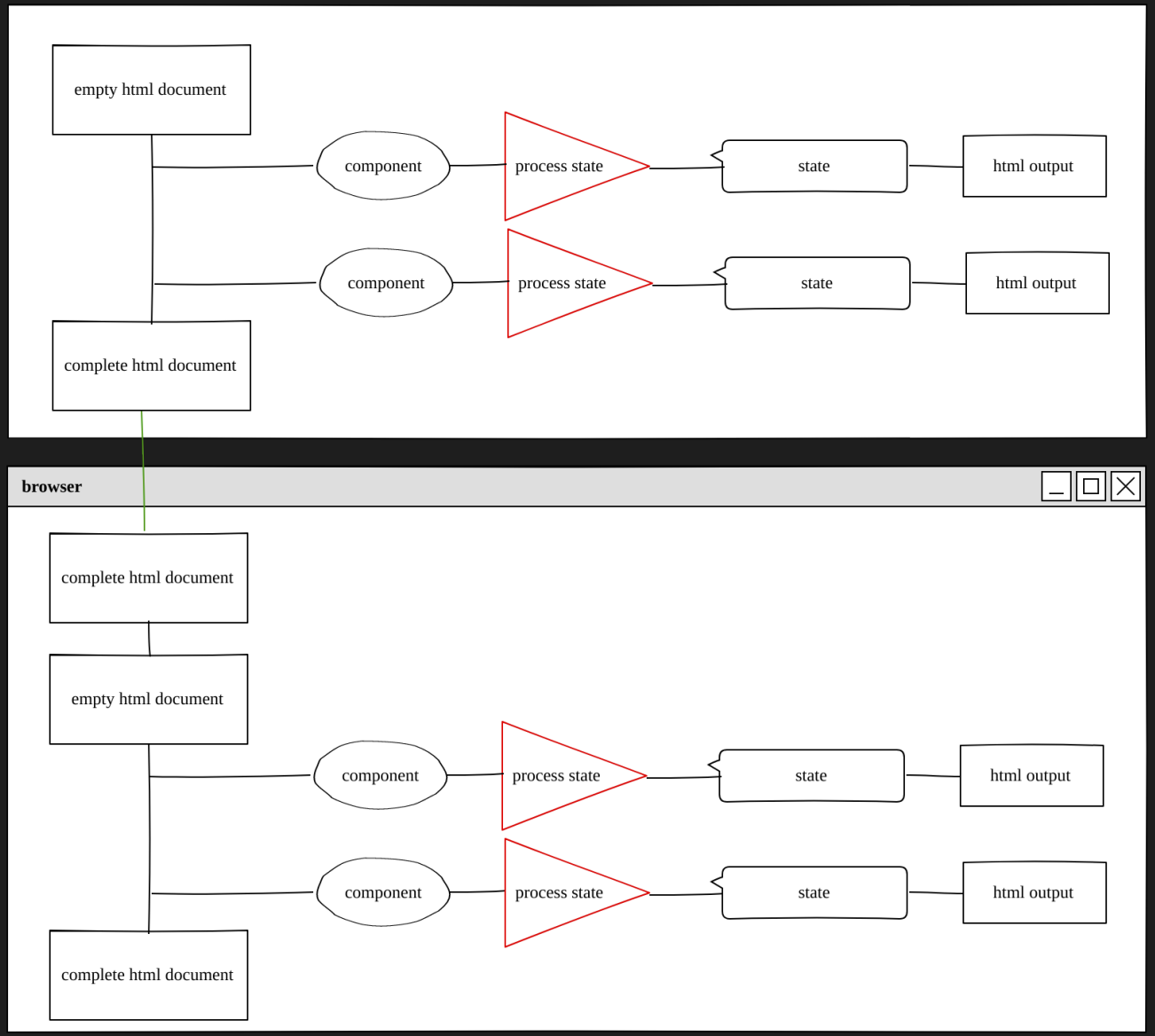
complete fix

- review of other slow screens
- **make developers question 'does this need to run on the server?**'



server state transfer

- entire page render flow is duplicated - everything
- no state transfer from server to browser
- key feature of Angular SSR missing


empty html document
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html output
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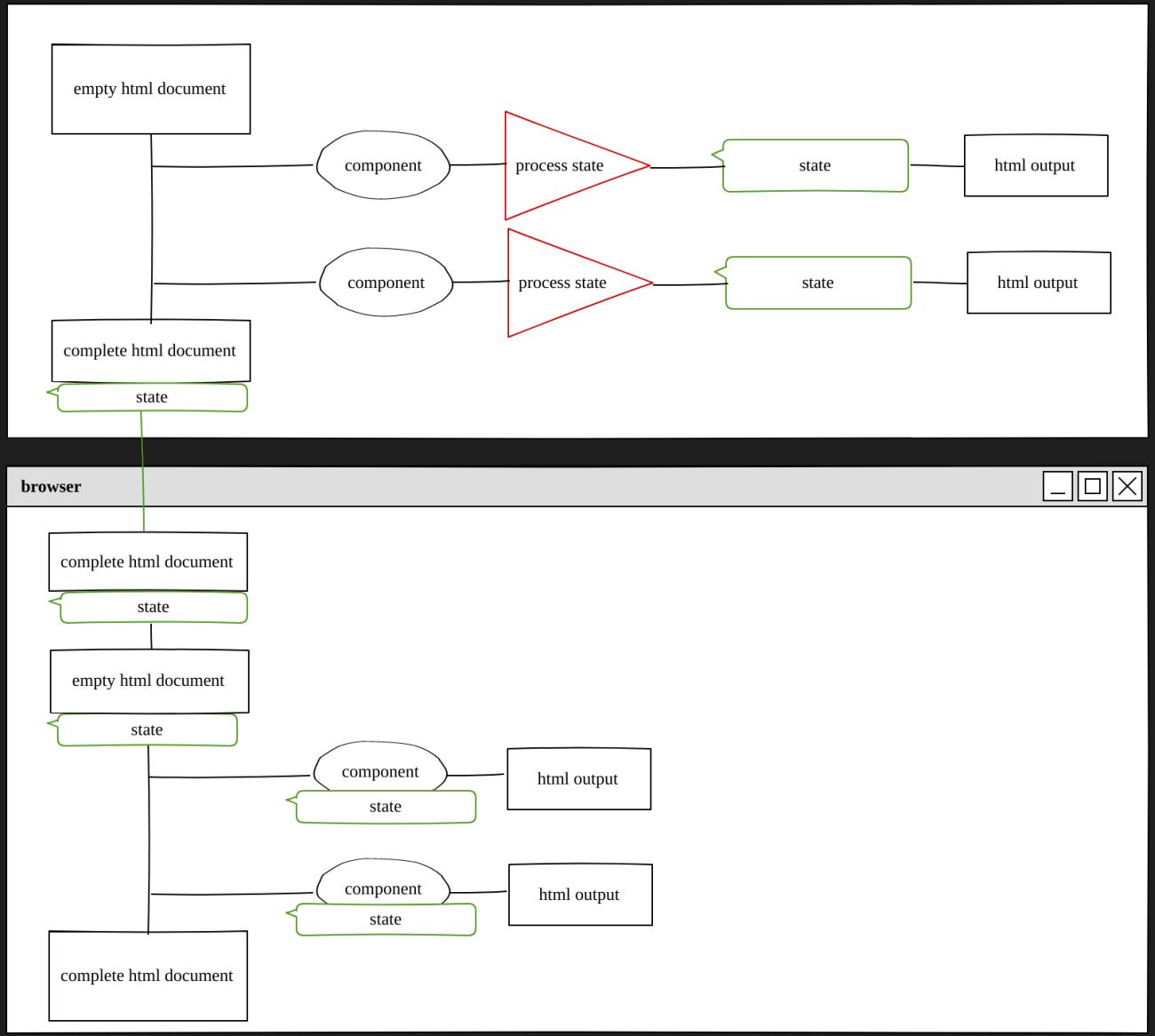
complete html document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state
html output
complete html document

LCP gain

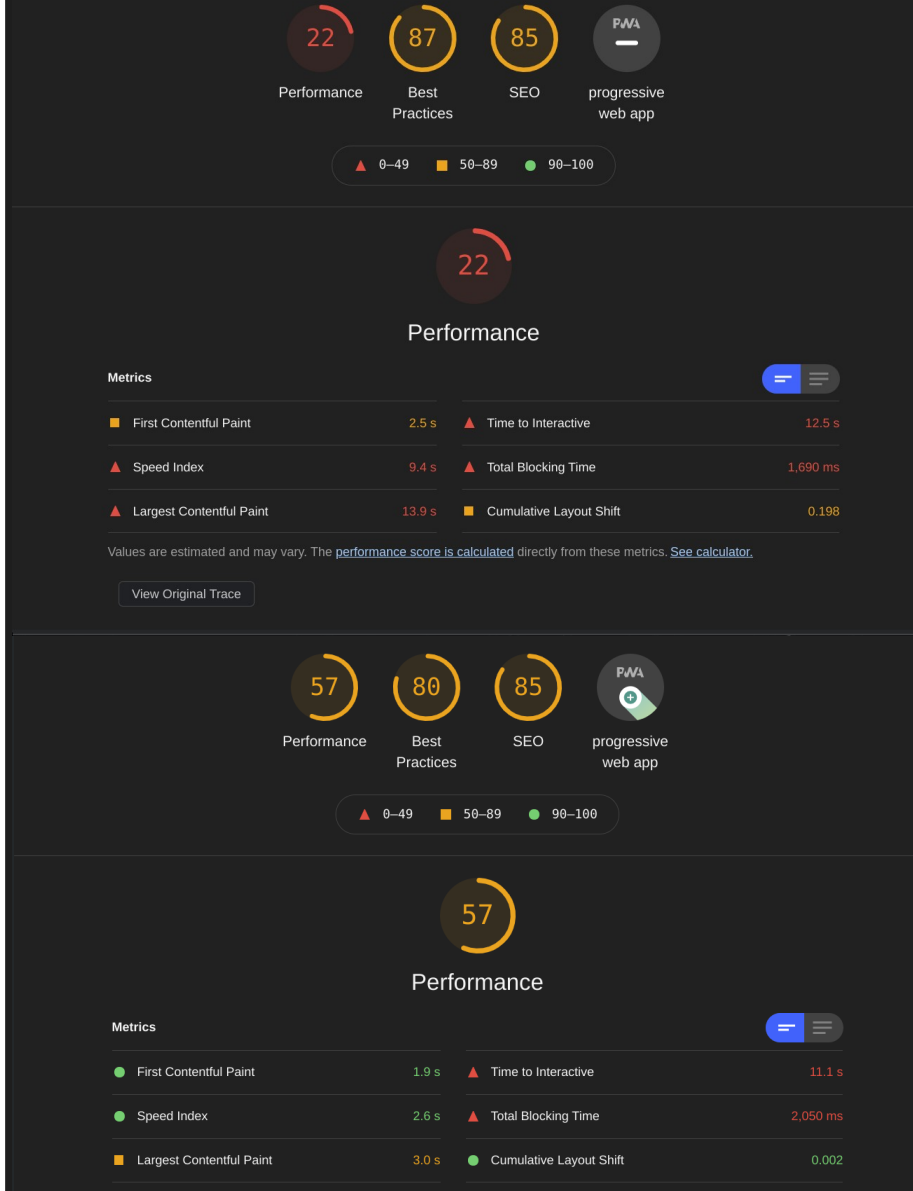
- testing being done using same scoring system as google

- in testing /resultat LCP dropped from 14s to 3s

- LCP gain of 11 seconds for average mobile devices

- biggest gain due to state transfer

- no need to create search results twice



LCP gain

- testing being done using same scoring system as google

- in testing / (homepage) LCP dropped from 9s to 3.8s
- LCP gain of 5 seconds for average mobile devices

- biggest gain due lower core JS bundle size
- non blocking render