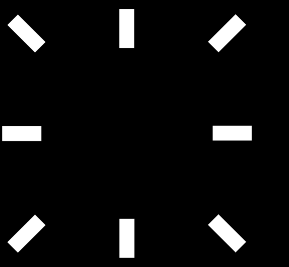


MICROBLINK

See beyond.



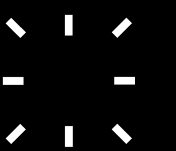
Micronaut on GraalVM - things we encountered and solved

Krešimir Horvat

JavaCroz

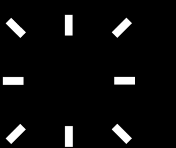
O meni

- Diplomirao 2013 na Fakultetu organizacije i informatike
- 8+ godina rada s Javom i vezanim tehnologijama
- Zaposlen u Microblinku od 07/2020



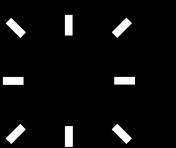
Microblink

- Microblink je AI kompanija koja razvija tehnologiju za računalni vid kojom olakšava život preko 100 milijuna krajnjih korisnika širom svijeta
- BlinkID je naš glavni proizvod
 - Omogućava skeniranje osobnih dokumenata u realnom vremenu ili uploadom fotografije
 - Skeniranjem osobnih podataka podržavamo prvi korak u verifikaciji korisnika, problem za koji sada razvijamo end to end rješenje



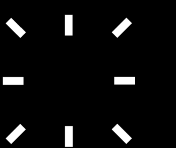
Self hosted API v1

- Docker image = Java + Spring Boot + Microblink Java 16 + recognition binary
- Jedan endpoint za document recognition bez definiranog response tipa
 - nema generiranja API dokumentacije
 - Dokumentacija je Postman kolekcija
- Nepregledan codebase i česti bugovi



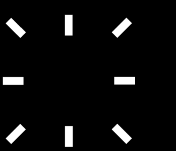
Self hosted API v2

- Definirani endpoint i generiranje OpenAPI dokumentacije
- Veća modularizacija rješenja
- Bolje logiranje
- Unit i integracijski testovi
- Brzina (startup, request)



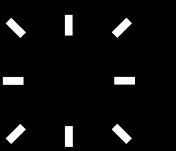
Tech discovery

- Kotlin
- Gradle
- Spring vs Micronaut vs ostali
- GraalVM?



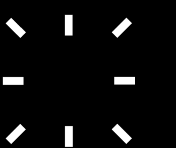
Micronaut

- Sličan Springu
- OpenAPI
- Netty, Jetty, Tomcat, Undertow
- Podrška za GraalVM build



GraaIVM

- Micronaut nudi dobru podršku za GraaIVM
- Server startup <100ms
- Brži response
- Jednostavno kreiranje osnovne aplikacije



Problemi GraalVM

- Upgrade third party library-a ruši native image build
- jackson-module-kotlin

- ImageIO library

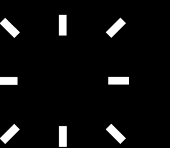
- Reflection-config
- JNI-config

```
{  
  "name": "sun.awt.X11GraphicsEnvironment",  
  "methods": [  
    {  
      "name": "<init>",  
      "parameterTypes": []  
    }  
  ]  
},
```

- `java -agentlib:native-image-agent=config-output-dir=native-image -jar build/layers/application.jar`

- Logback

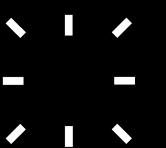
```
Args = -H:ReflectionConfigurationResources=${.}/reflect-config.json,${.}/reflect-config-logback.json \  
-H:ResourceConfigurationResources=${.}/resource-config.json \  
-H:+ReportExceptionStackTraces \  
--initialize-at-build-time=org.slf4j
```



Problemi Micronaut + GraalVM

- @Introspected na svim klasama koje se serijaliziraju
- @JsonInclude(JsonInclude.Include.NON_EMPTY)
 - Ne radi ako se JAR ne build-a GraalVM JDK-om - Micronaut introspection module
- Mapstruct

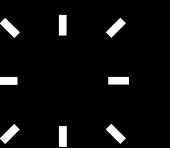
```
@Mapper(  
    componentModel = "jsr330",  
    uses = [DateResultMapper::class, BarcodeElementMapper::class],  
    injectionStrategy = InjectionStrategy.CONSTRUCTOR  
)
```



Problemi Micronaut + GraalVM

- Docker = native image + Microblink recognition binary
 - docker pull microblink/api:2
- Prva verzija - base image frovlad/alpine-glibc
- Security scan grype 0.13.0

NAME	INSTALLED	FIXED-IN	VULNERABILITY	SEVERITY
apk-tools	2.10.6-r0	2.10.7-r0	CVE-2021-36159	Medium
glibc	2.32-r0	(fixes indeterminate)	CVE-2020-1752	High
glibc	2.32-r0	(fixes indeterminate)	CVE-2020-27618	Medium
glibc	2.32-r0	(fixes indeterminate)	CVE-2021-3326	High
glibc	2.32-r0	(fixes indeterminate)	CVE-2019-25013	Medium
glibc	2.32-r0	(fixes indeterminate)	CVE-2021-38604	High
glibc	2.32-r0	(fixes indeterminate)	CVE-2019-1010023	High
glibc	2.32-r0	(fixes indeterminate)	CVE-2019-1010025	Medium
glibc	2.32-r0	(fixes indeterminate)	CVE-2020-29562	Medium
glibc	2.32-r0	(fixes indeterminate)	CVE-2021-27645	Low
glibc	2.32-r0	(fixes indeterminate)	CVE-2010-4756	Medium
glibc	2.32-r0	(fixes indeterminate)	CVE-2021-33574	Critical
glibc	2.32-r0	(fixes indeterminate)	CVE-2021-35942	Critical
glibc	2.32-r0	(fixes indeterminate)	CVE-2019-1010022	Critical
glibc	2.32-r0	(fixes indeterminate)	CVE-2020-10029	Medium
glibc	2.32-r0	(fixes indeterminate)	CVE-2019-1010024	Medium



Problemi Micronaut + GraalVM

- Static native image build (--static --libc=musl), base image alpine:3.14
 - Kompleksan Dockerfile
 - Sigurniji image

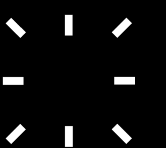
```
~ $ docker scan microblink/api:2
```

```
Testing microblink/api:2...
```

```
Organization:    khorvat1
Package manager: apk
Project name:    docker-image|microblink/api
Docker image:    microblink/api:2
Platform:        linux/amd64
Base image:      alpine:3.14.2
Licenses:        enabled
```

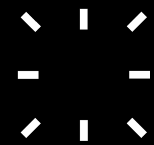
```
✓ Tested 14 dependencies for known issues, no vulnerable paths found.
```

```
According to our scan, you are currently using the most secure version of the selected base image
```



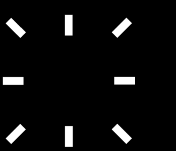
Performanse - startup

Median (ms)	CPU: 4 RAM: 8		CPU: 6 RAM: 12	
	Liveness	Readiness	Liveness	Readiness
V1	8712	8767	8285	8342
V2	597	649	602	654



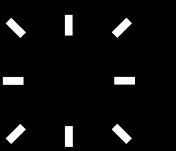
Performanse - runtime

- Prvi request
 - BlinkID do 2 sek brži
 - BlinkID combined do 3 sek brži
- Ostali
 - BlinkID do 15% brži
 - BlinkID combined do 40% brži



Zaključak

- Dosta malih prilagodbi usporava development za značajan postotak
- GraalVM koristimo za projekte gdje su nam bitni brzina i veća sigurnost



Hvala na pažnji

