Online Store: Backend Infrastructure





- Introduction
- Infrastructure
- Code
- What's next?
- DEMO
- Questions

Components

MongoDB	Docker	Java
Spring	REST	Spring Boot
Travis CI	Ubuntu	Swagger

...

- Maven Build system
- TestNG Unit, integration tests
- Java libs Jackson, Apache POI...
- Github Git repo and issues
- ...

Metrics

> 200 commits

> 40 tasks

90% Code coverage

Infrastructure



PUBLIC REPOSITORY

nbakaev/hishop-api-backend ☆

Last pushed: a day ago

```
Raw Blame History 
FROM java:8

VOLUME /tmp

ADD release.jar app.jar

EXPOSE 8080

RUN bash -c 'touch /app.jar'

ENTRYPOINT ["java","-Djava.security.egd=file:/dev/./urandom", "-jar", "/app.jar", "--spring.profiles.active=production"]
```

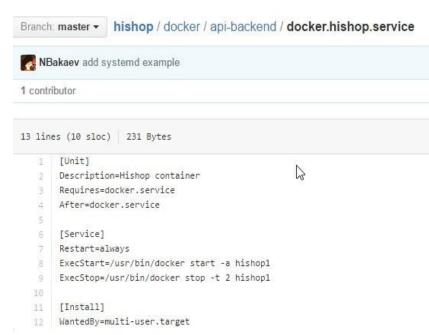
```
docker run -d -p 5555:5555 \
    -e "spring_data_mongodb_uri=mongodb://H7sXKfNiJOoBPByF:X5hQ8Kx9KQZ9165.mongolab.com:39165/hishop" \
    -e "mailgun_api_key=key-b305ee369ffb69e8b559" \
    -e "mailgun_url=https://api.mailgun.net/v3/sandbox21473e1b5f3344c2950ac2e779eb7a46.mailgun.org/messages" \
    -e "spring.output.ansi.enabled=ALWAYS" \
    --name hishop1 nbakaev/hishop-api-backend:0.2.2-RELEASE_build.127763392
```

system

Startup scripts

Usage

- 1) copy to /etc/systemd/system/
- 2) systemctl enable docker.hishop
- manually start service systemctl start docker.hishop
- manually see status service systemctl status docker.hishop



```
docker logs -f hishop1
 root@sl 🚬 docker run -d -e "spring_data_mongodb_uri=mongodb://H7sXKfNiJOoDw7kBPByF:X5hQ8KxlzxnYW9KQZ5EC@ds039165.mongolab.com:39165/hishop" -e mailgun_api_key="key-b305ee36a0calcac9d8a9ffb69e8b559" -e "mailgun_url=https://api.mail
 m.net/v3/sandbox21473e1b5f3344c2950ac2e779eb7a46.mailqun.org/messages" -e spring.output.ansi.enabled=ALWAYS --name hishop1 nbakaev/hishop-api-backend:0.2.2-RELEASE build.127763392
  root@sl > docker logs -f hishopl
```

```
Starting StartApplication v0.2.2-RELEASE+build.127763392 on 44e672806752 with PID 1 (/app.jar started by root in /)
                                              main | ru.nbakaev.hishop.StartApplication
                                              main | ru.nbakaev.hishop.StartApplication
                                                                                               The following profiles are active: production
                                              main] ationConfigEmbeddedWebApplicationContext: Refreshing org.springframework.boot.context.embedded.AnnotationConfigEmbeddedWebApplicationContext@48c7b2ld: startup date [Sun May 08 12:46:
                                                                                               Overriding bean definition for bean 'passwordEncoder' with a different definition: replacing [Root bean: class [null]; scope=; abstract=fals
                                              main] o.s.b.f.s.DefaultListableBeanFactory
 lazyInit=false; autowireMode=3; dependencyCheck=0; autowireCandidate=true; primary=false; factoryMeanName=springSecurityConfig; factoryMethodName=passwordEncoder; initMethodName=null; destroyMethodName=(inferred); defined in class pat
resource [ru/nbakaev/hishop/configs/SpringSecurityConfig.class]] with [Root bean: class [null]; scope=; abstract=false; lazyInit=false; autowireMode=3; dependencyCheck=0; autowireCandidate=true; primary=false; factoryBeanName=beansCon
gs; factoryMethodName=passwordEncoder; initMethodName=null; destroyMethodName=(inferred); defined in class path resource [ru/nbakaev/hishop/configs/BeansConfigs.class]]
```

main] o.s.b.f.s.DefaultListableBeanFactory Overriding bean definition for bean 'beanNameViewResolver' with a different definition: replacing [Root bean: class [null]; scope=; abstract false; lazyInit=false; autowireMode=3; dependencyCheck=0; autowireCandidate=true; primary=false; factoryBeanName=org.springframework.boot.autoconfigure.web.ErrorMvcAutoConfiguration\$WhitelabelErrorViewConfiguration; factoryMethodName=br nNameViewResolver; initMethodName=null; destroyMethodName=(inferred); defined in class path resource [org/springframework/boot/autoconfigure/web/ErrorMvcAutoConfiguration\$WhitelabelErrorViewConfiguration.class]] with [Root bean: class ull]; scope=; abstract=false; lazyInit=false; autowireMode=3; dependencyCheck=8; autowireCandidate=true; primary=false; factoryBeanName=org.springframework.boot.autoconfigure.web.WebMvcAutoConfiguration\$WebMvcAutoConfiguration\$Adapter.class]]

ctoryMethodName=beanNameViewResolver; initMethodName=null; destroyMethodName=(inferred); defined in class path resource [org/springframework/boot/autoconfigure/web/WebMvcAutoConfiguration\$WebMvcAutoConfiguration\$Adapter.class]]

```
main] s.b.c.e.t.TomcatEmbeddedServletContainer : Tomcat initialized with port(s): 5555 (http)
            main] o.apache.catalina.core.StandardService
            main] org.apache.catalina.core.StandardEngine
                                                                Starting Servlet Engine: Apache Tomcat/8.0.30
Initializing Spring embedded WebApplicationContext
                                                                 Root WebApplicationContext: initialization completed in 9233 ms
[ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean
                                                                 Mapping filter: 'hiddenHttpMethodFilter' to: [/*]
                                                                 Mapping filter: 'httpPutFormContentFilter' to: [/*]
[ost-startStop-1] o.s.b.c.embedded.FilterRegistrationBean
                                                                 Mapping filter: 'requestContextFilter' to: [/*]
                                                                Mapping filter: 'springSecurityFilterChain' to: [/*]
```

[ost-startStop-1] org.mongodb.driver.cluster Cluster created with settings {hosts=[ds039165.mongolab.com:39165], mode=SINGLE, requiredClusterType=UNKNOWN, serverSelectionTimeout='30000

Monitor thread successfully connected to server with description ServerDescription{address=ds039165.mongolab.com:39165, type=REPLICA SET PRI MRY, state=CONNECTED, ok=true, version=ServerVersion{versionList=[3, 0, 8]}, minWireVersion=0, maxWireVersion=3, electionId=568a089862c39c49d7ffa261, maxDocumentSize=16777216, roundTrioTimeNanos=82172280, setName='rs-ds039165', canonica

-05-08 12:46:42.031 INFO 1 --- [ost-startStop-1] o.s.s.web.DefaultSecurityFilterChain Creating filter chain: org.springframework.security.web.util.matcher.AnyRequestMatcher@l, [org.springframework.security.web.context.request async.WebAsyncManagerIntegrationFilter@4651d31a, org.springframework.security.web.context.SecurityContextPersistenceFilter@705878a1, org.springframework.security.web.header.HeaderWriterFilter@435b109a, org.springframework.security.web.au thentication, logout.LogoutFilter@737377e8, org.springframework.security.web.authentication.www.BasicAuthenticationFilter@367e5bc0, org.springframework.security.web.savedrequest.RequestCacheAwareFilter@34ef5d6b, org.springframework.security.web.savedrequest.RequestCacheAwareFilter@34ef5d6b, org.springframework.security.web.savedrequest.RequestCacheAwareFilter@34ef5d6b, org.springframework.security.web.savedrequest.RequestCacheAwareFilter@34ef5d6b, org.springframework.security.web.savedrequest.RequestCacheAwareFilter@34ef5d6b, org.springframework.security.web.savedrequest.RequestCacheAwareFilter@34ef5d6b, org.springframework.security.web.savedrequest.RequestCacheAwareFilter@34ef5d6b, org.springframework.security.web.savedrequest.RequestCacheAwareFilter@34ef5d6b, org.springframework.security.web.savedrequest.Request.

12:46:40.499 INFO 1 --- [golab.com:39165] org.mongodb.driver.cluster

[golab.com:39165] org.mongodb.driver.connection

sing default security password: f0142542-142c-4577-bcac-4558df7c42ed

2016-05-08	12:46:46.954 INF 12:46:47.008 INF	main] o.s.w.s.handler.SimpleUrlHandlerMapping	: Adding welcome page: class path resource [static/index.html] : Root mapping to handler of type [class org.springframework.web.servlet.mvc.ParameterizableViewController]
	12:46:47.114 INF		: Mapped URL path [/webjars/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
	12:46:47.115 INF 12:46:47.339 INF		Mapped URL path [/**] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler]
	12:46:47.339 INF 12:46:48.181 INF		: Mapped URL path [/**/favicon.ico] onto handler of type [class org.springframework.web.servlet.resource.ResourceHttpRequestHandler] : Reqistering beans for JMC exposure on startup
	12:46:49.475 INF	main s.b.c.e.t.TomcatEmbeddedServletContainer	
	12;46;49.520 IN F		: Started StartApplication in 25.06 seconds (JVM running for 26.857)

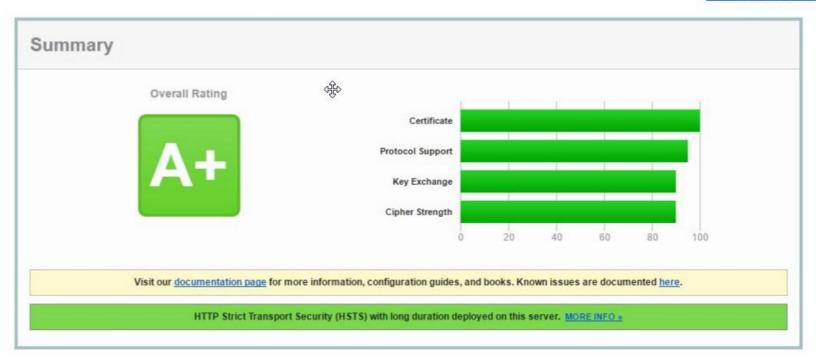


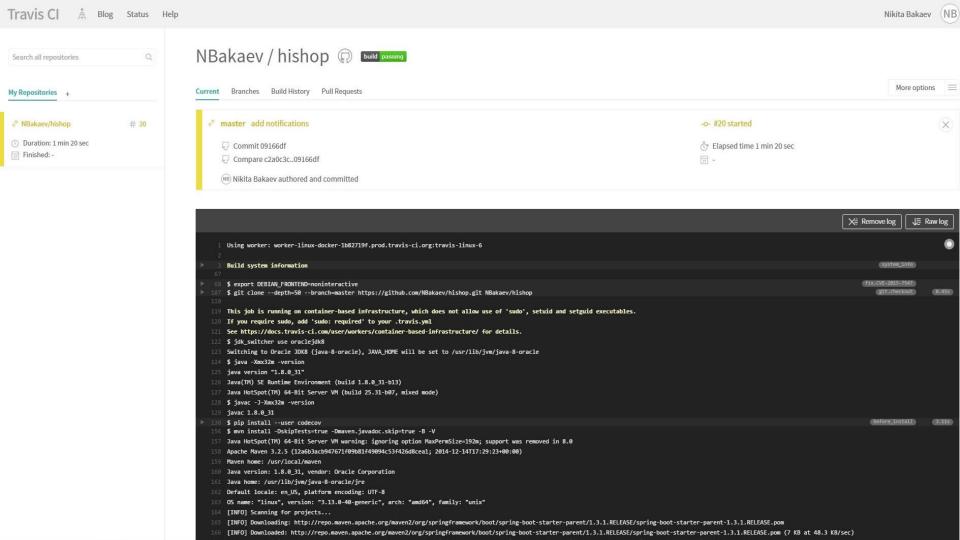
You are here: Home > Projects > SSL Server Test > s2.nbakaev.ru

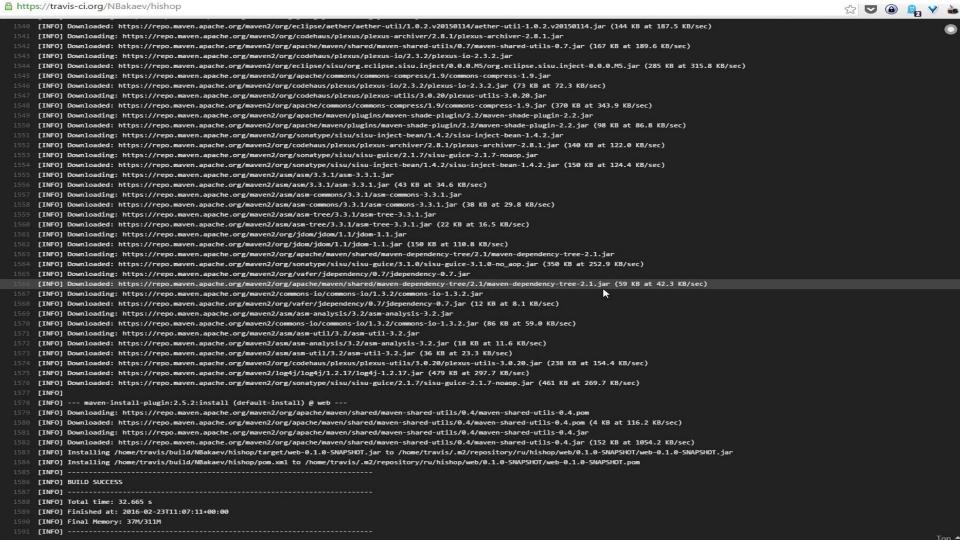
SSL Report: s2.nbakaev.ru (128.199.50.77)

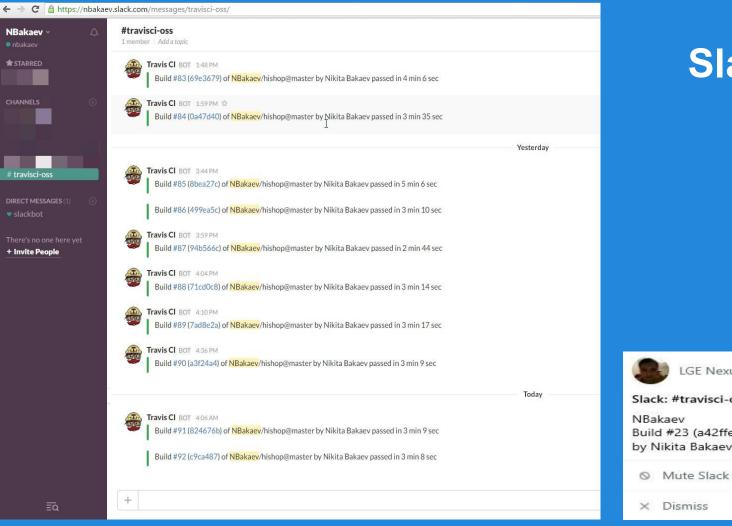
Assessed on: Thu, 28 Apr 2016 11:21:10 UTC | Hide | Clear cache

Scan Another »

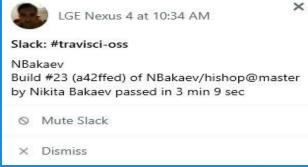


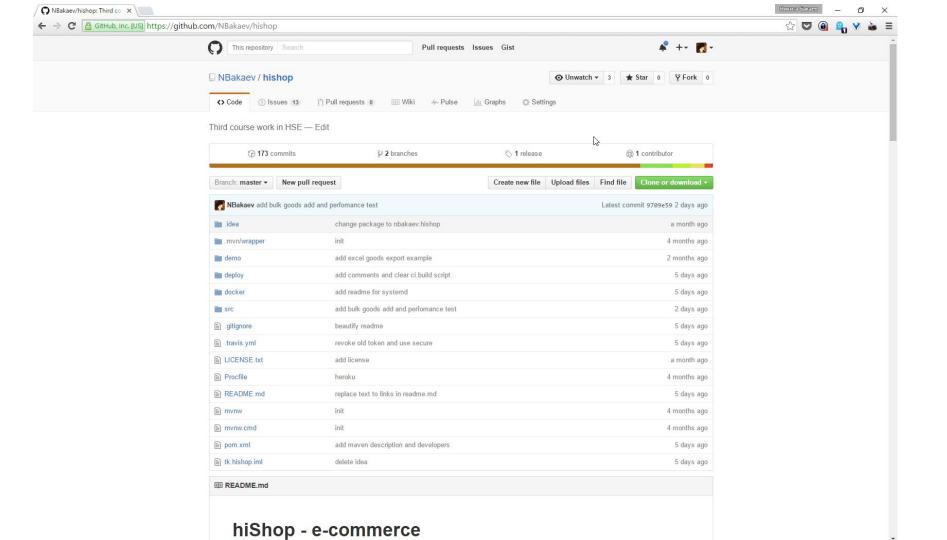


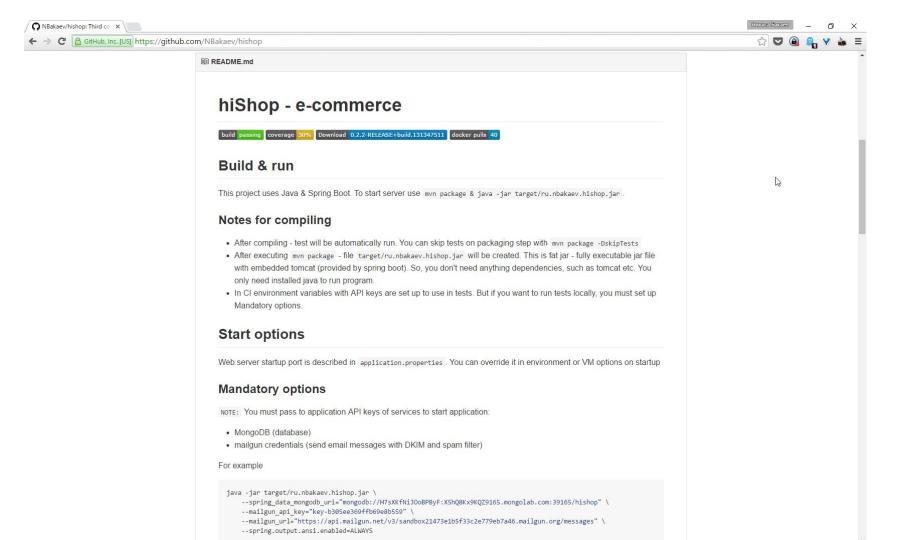




Slack







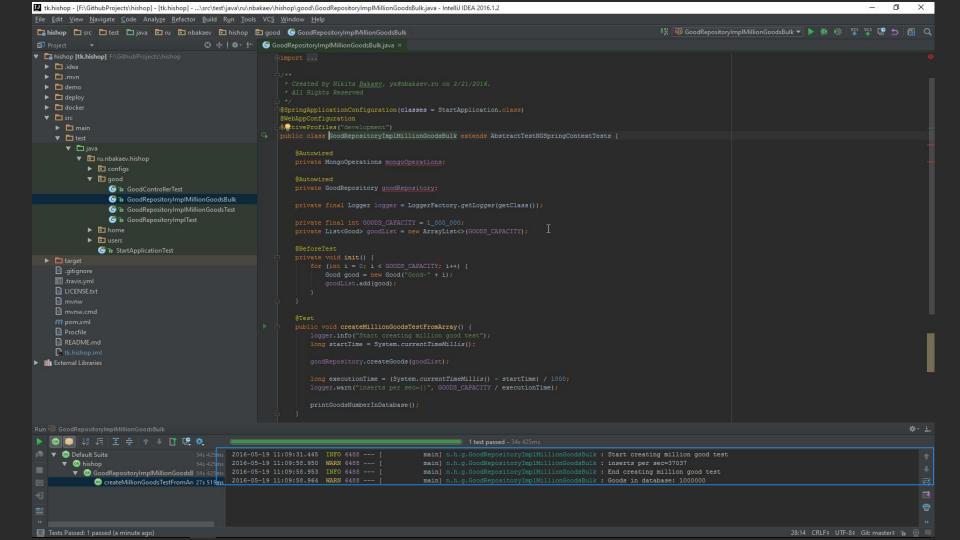
Performance

```
@WebAppConfiguration
@ActiveProfiles("development")
public class GoodRepositorvImplMillionGoodsBulk extends AbstractTestNGSpringContextTests {
    @Autowired
   private MongoOperations mongoOperations;
    MAutowired
    private GoodRepository goodRepository:
   private final Logger logger = LoggerFactory.getLogger(getClass());
   private final int GOODS CAPACITY = 1_000_000;
   private List<Good> goodList = new ArrayList<>(GOODS CAPACITY);
    // before this test we can have goods in database
    private long beforeTestExecutionGoods:
    @BeforeClass
   private void init()
        for (int i = 0; i < GOODS CAPACITY; i++) {
           Good good = new Good("Good-" + i);
           goodList.add(good);
                                                                                       * Print goods number in database
       beforeTestExecutionGoods = mongoOperations.count(new Query(new Criteria())
                                                                                     private void printGoodsNumberInDatabase() {
                                                                                         Criteria criteria = new Criteria():
    @Test
                                                                                         Query query = new Query(criteria);
    public void createMillionGoodsTestFromArrav() {
        logger.info("Start creating million good test");
                                                                                         logger.info("End creating million good test");
        long startTime = System.currentTimeMillis();
                                                                                         long goodsInDatabase = mongoOperations.count(query, Good.class);
        goodRepository.createGoods(goodList);
                                                                                         logger.warn("Goods in database: {}", goodsInDatabase);
        long executionTime = (System.currentTimeMillis() - startTime) / 1000;
                                                                                         Assert.assertEquals(goodsInDatabase, GOODS CAPACITY + beforeTestExecutionGoods);
        logger.warn("inserts per sec={}", GOODS CAPACITY / executionTime);
        printGoodsNumberInDatabase();
```

@SpringApplicationConfiguration(classes = StartApplication.class)

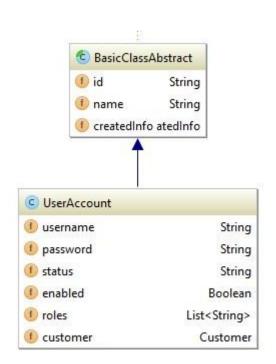
Add goods

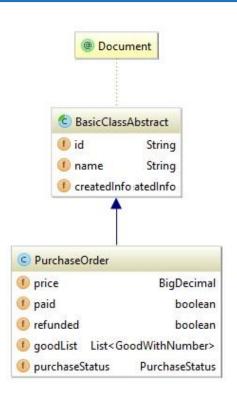
1 000 000 37 037 inserts 27 per/sec sec

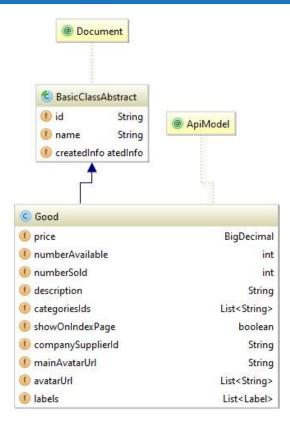


Deeper in the code

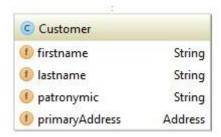
Domain models

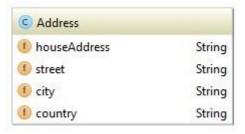


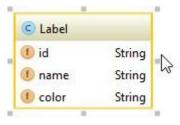


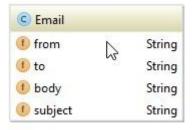


Domain models

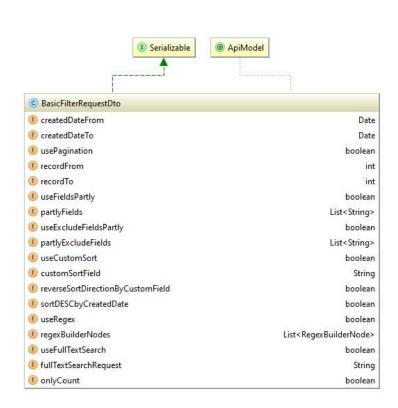








DTO



```
public abstract class DtoResponseResult {
    /**
     * All objects relevant to some search criteria
    * Different from returnedObjectsNumber
     * when used pagination
   private long relevantObjectsNumber;
   private long returnedObjectsNumber;
   private List<? extends BasicClassAbstract> resultedObjects = new ArrayList<>();
   public long getRelevantObjectsNumber() { return relevantObjectsNumber; }
   public void setRelevantObjectsNumber(long relevantObjectsNumber) {
       this.relevantObjectsNumber = relevantObjectsNumber;
   public long getReturnedObjectsNumber() { return returnedObjectsNumber; }
   public void setReturnedObjectsNumber(long returnedObjectsNumber) {
        this.returnedObjectsNumber = returnedObjectsNumber;
   public List<? extends BasicClassAbstract> getResultedObjects() { return resultedObjects; }
   public void setResultedObjects(List<? extends BasicClassAbstract> resultedObjects) {
        this.resultedObjects = resultedObjects;
```

MVC

@Controller

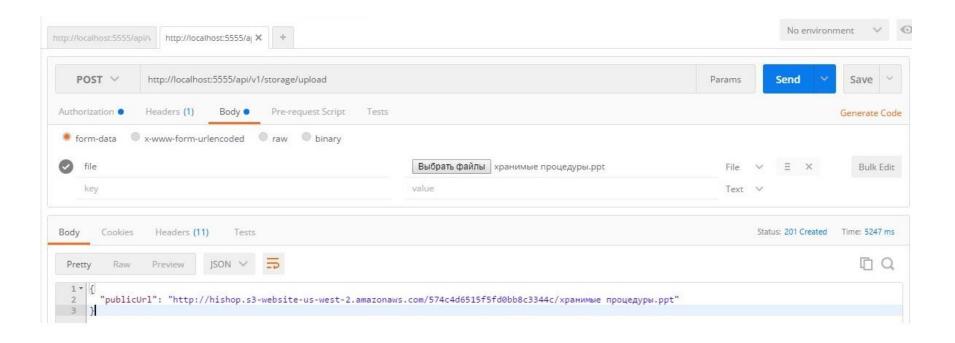
```
@RequestMapping("/api/v1/good")
@Api("Goods")
public class GoodController {
   private final GoodRepository goodRepository;
   private final GoodExcelExportService goodExcelExportService;
    @Autowired
   public GoodController(final GoodRepository goodRepository, final GoodExcelExportService goodExcelExportService) {
       this.goodRepository = goodRepository;
       this.goodExcelExportService = goodExcelExportService;
    @Secured({UserAccountRoles.ROLE_ADMIN})
    @RequestMapping(value = "", method = RequestMethod.POST)
    public
    @ResponseBody
    Good addGood(@RequestBody Good good, HttpServletRequest request) {
       goodRepository.createGood(good);
       return good;
    @RequestMapping(value = "", method = RequestMethod.GET)
    public
    @ResponseBody
    List(Good) getAllGoods() {
       return goodRepository.getAllGoods();
    @Secured({UserAccountRoles.ROLE ADMIN})
    @RequestMapping(value = "", method = RequestMethod.PUT)
    public
    @ResponseBody
    Good updateGood(@RequestBody Good good, HttpServletRequest request) {
       goodRepository.updateGood(good);
       return good;
    @Secured({UserAccountRoles.ROLE_ADMIN})
    @RequestMapping(value = "{id}", method = RequestMethod.DELETE)
    public void deleteGoodById(@PathVariable("id") String id) {
        goodRepository.deleteGoodById(id);
```

Data layer

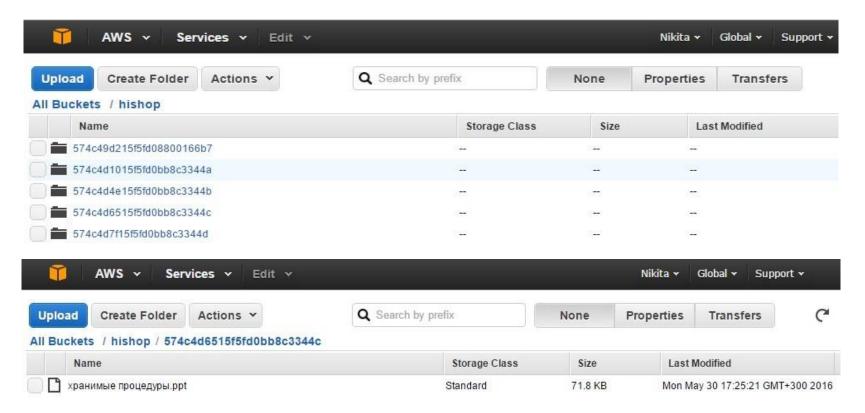
```
@Service
public class GoodRepositoryImpl implements GoodRepository {
   private final MongoOperations mongoTemplate;
   private final EntityFilterService entityFilterService;
    @Autowired
    public GoodRepositoryImpl(final MongoOperations mongoTemplate, final EntityFilterService entityFilterService) {
        this.mongoTemplate = mongoTemplate;
        this.entityFilterService = entityFilterService;
    @Override
   public List<Good> createGoods(List<Good> goods) {
        mongoTemplate.insert(goods, Good.class);
       return goods;
    @Override
   public Good createGood(Good good) {
       mongoTemplate.insert(good);
       return good;
    @Override
   public List<Good> getAllGoods() {
        Criteria criteria = new Criteria():
       Query query = new Query(criteria);
        return mongoTemplate.find(query, Good.class);
    @Override
    public Good updateGood(Good good) {
        mongoTemplate.save(good);
       return good;
    @Override
    public void deleteGoodById(String id) {
        Good good = new Good();
        good.setId(id);
        mongoTemplate.remove(good);
```

AWS S3

AWS S3: public bucket, CORS



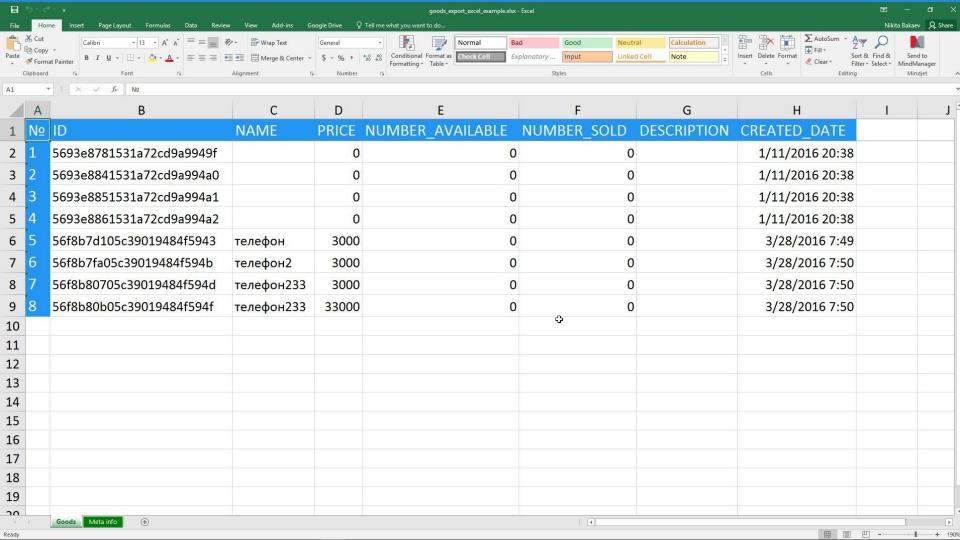
AWS S3: public bucket, CORS

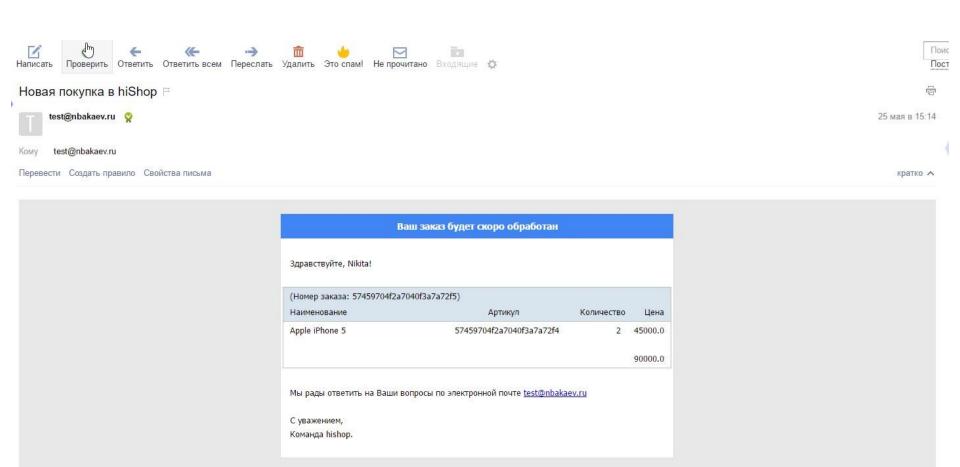


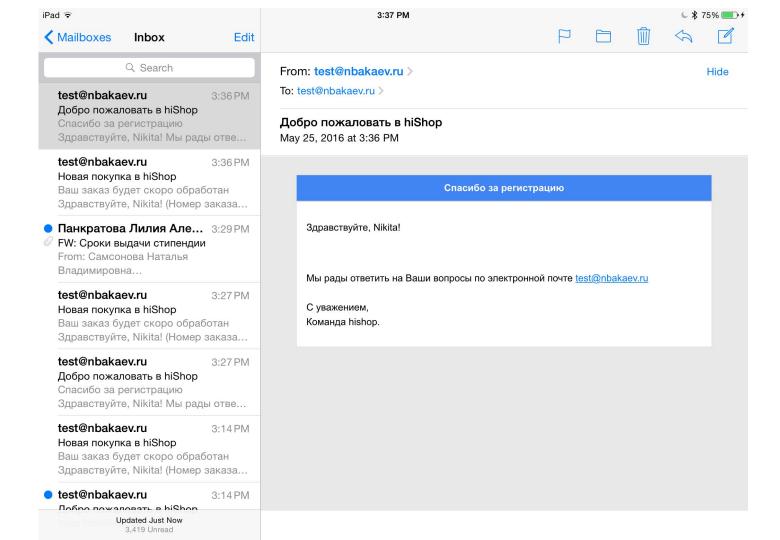
AWS S3: test: read from FS -> upload -> assert

```
@Test
public void testUploadToAmazonS3() throws Exception {
   // file name of real file in file system in resource folder
    String uploadFileName = "test upload.jpg";
   byte[] uploadFilenameBytes = IOUtils.toByteArray(new ClassFathResource(uploadFileName).getInputStream());
   MockMultipartFile file = new MockMultipartFile("file", uploadFileName, null, new ClassPathResource(uploadFileName).getInputStream());
   // make request to our server
   byte[] result = mockMvc.perform(fileUpload("/api/v1/storage/upload")
            .file(file).with(user("test2@nbakaev.ru").roles("USER", "ADMIN")))
            .andExpect(status().is(201)).andReturn().getResponse().getContentAsByteArray();
    StorageDocumentMeta storageDocumentMeta = objectMapper.readValue(result, StorageDocumentMeta.class);
   Assert.assertNotNull(storageDocumentMeta);
   Assert.assertNotNull(storageDocumentMeta.getPublicUrl());
   // get real request to avs s3 and assert to content of file in our FS
   Assert.assertEquals(IOUtils.toByteArray(new URL(storageDocumentMeta.getPublicUrl())), uploadFilenameBytes);
```

Excel & Templates







What's next?

What's next? 1/4

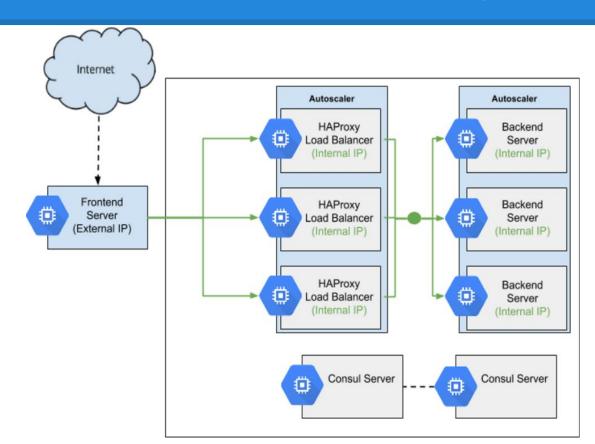
Backend: high availability cluster, auto scaling, container orchestration (kubernetes)

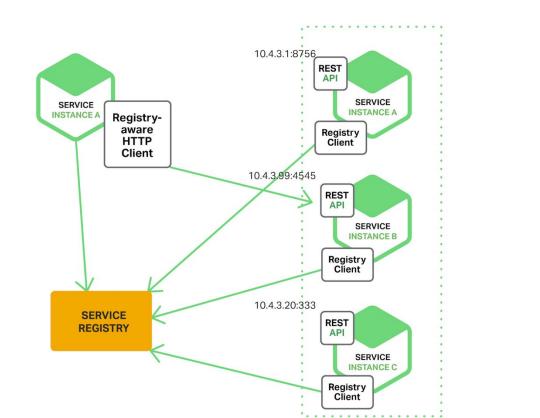
Database: sharding, replica set ...more features

What's next? 2/4

External configuration: consul, recommendation, machine learning for goods

auto scaling, service discovery, load balancing





Purchase -> microservice with RDBMS (to have transactions)

i18n / i10n

What's next?

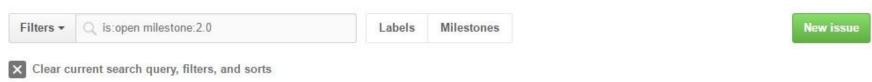
3/4

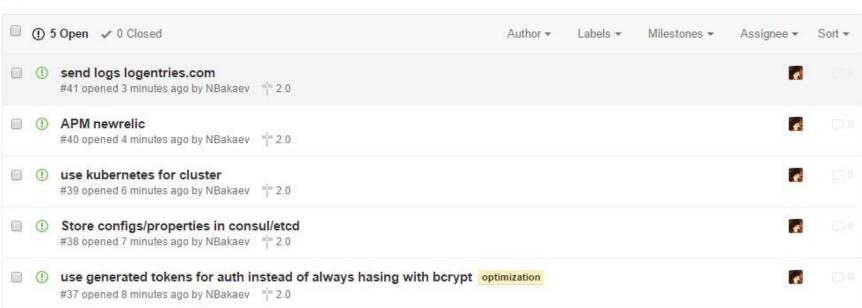
Templates in html render to .doc/.pdf
Easier
more powerful than Jaspersoft Studio

Custom fields

MongoDB schemaless
full-text search, detailed queries, ranges

• • •





DEMO

Questions