The QuoteServices App Case Study: Zippy Microservice Structure & Functionality (Part 1)

Douglas C. Schmidt
d.schmidt@vanderbilt.edu
www.dre.vanderbilt.edu/~schmidt

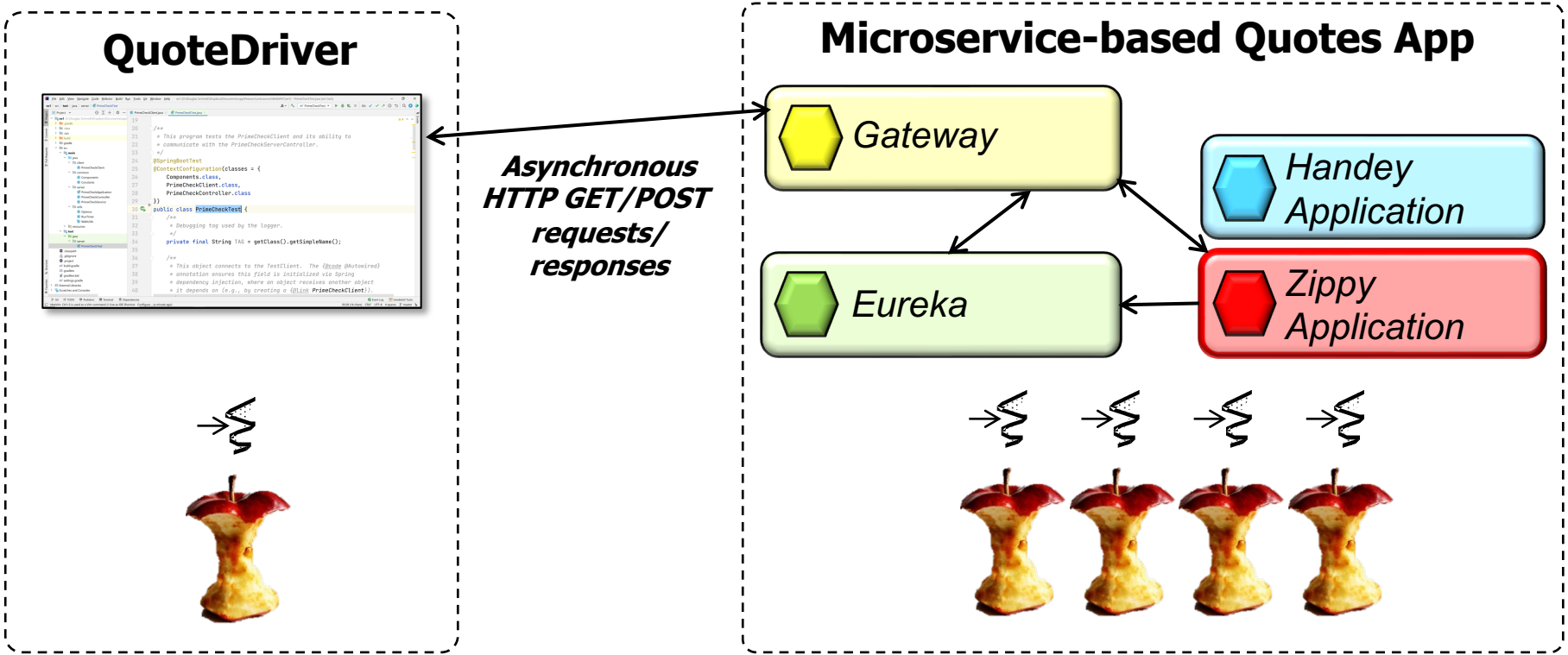
Professor of Computer Science

Institute for Software Integrated Systems

Vanderbilt University
Nashville, Tennessee, USA

Learning Objectives in this Part of the Lesson

- Understand the structure & functionality of the ZippyController/ZippyService microservice & how it encapsulates the Jakarta Persistence API (JPA)



This microservice also uses Project Reactor reactive types (Flux)

Structure & Functionality of the ZippyApplication

Structure & Functionality of the ZippyApplication

- Provides the entry point into the Spring WebFlux-based version of the Zippy Quote microservice

```
@SpringBootApplication
@EntityScan(basePackageClasses =
                {Quote.class})
@EnableJpaRepositories(basePackageClasses =
                  {ZippyQuoteRepository.class})
public class ZippyApplication
       extends BaseApplication {



  public static void main(String[] args) {
    run(ZippyApplication.class, args);
  }
}
```

See zippymicroservice/src/main/java/edu/vandy/quoteservices/microservice/ZippyApplication.java

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}
```

BaseApplication defines the run() method used by both the HandeyApplication & ZippyApplication

See WebFlux/ex3/common/src/main/java/edu/vandy/quoteservices/common

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  public static void main(String[] args) {
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  }
}
```

These annotations enable this microservice to use the JPA

See springframework/data/jpa/repository/config/EnableJpaRepositories.html

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public class ZippyApplication
       extends BaseApplication {
```

The main entry-point method calls the BaseApplication helper method to build & run the Zippy microservice & register with the Eureka discovery service

```
   public static void main(String[] args) {
      run(ZippyApplication.class, args);
   }
}
```

Structure & Functionality of the ZippyController

Structure & Functionality of the ZippyController

- ZippyController maps HTTP GET & POST requests to endpoint handlers

```
@RestController
public class ZippyController {
   @Autowired
   ApplicationContext applicationContext;

   @Autowired
   ZippyService mService;

   ...
```

See zippymicroservice/src/main/java/edu/vandy/quoteservices/microservice/ZippyController.java

Structure & Functionality of the ZippyController

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public class ZippyController {
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  ApplicationContext applicationContext;

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  ...
```

This annotation ensures that request handling methods in the controller class all automatically serialize return objects into HttpResponse objects

See www.baeldung.com/spring-controller-vs-restcontroller

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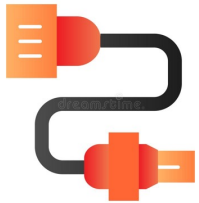

These fields are auto-wired by Spring's dependency injection framework

See www.baeldung.com/spring-autowire

Structure & Functionality of the ZippyController

- ZippyController maps HTTP GET & POST requests to endpoint handlers

```
@RestController
public class ZippyController {
   ...
   @GetMapping("/")
   public ResponseEntity<String> info() {

      return ResponseEntity
         .ok(applicationContext.getId()
             + " is alive and running at "
             + Thread.currentThread()
             + "\n");
   }
   ...
```

A GET request used to test Eureka connectivity

See spring.io/projects/spring-cloud-netflix

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      return ResponseEntity
         .ok(applicationContext.getId()
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             + Thread.currentThread()
             + "\n");
   }
   ...
```

Return a String with info about the microservice

Structure & Functionality of the ZippyController

- ZippyController maps HTTP GET & POST requests to endpoint handlers

```
@RestController
public class ZippyController {
   ...
   @GetMapping(GET_ALL_QUOTES)
   public Flux<Quote> getAllQuotes()
   { return mService.getAllQuotes(); }

   @PostMapping(POST_QUOTES)
   public Flux<Quote> postQuotes(@RequestBody List<Integer>
            quoteIds) { return mService.postQuotes(quoteIds); }

   @PostMapping(POST_SEARCHES)
   public Flux<Quote> search(@RequestBody List<String> queries)
   { return mService.search(queries); }
   ...
```

These methods handle GET & POST HTTP requests by forwarding to the service

See quoteservices/microservice/ZippyController.java

Structure & Functionality of the ZippyController

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   { return mService.search(queries); }
   ...
```

These methods return Flux objects based on service responses

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   ...
   @GetMapping(GET_ALL_QUOTES)
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   public Flux<Quote> postQuotes(@RequestBody List<Integer>
            quoteIds) { return mService.postQuotes(quoteIds); }

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   public Flux<Quote> search(@RequestBody List<String> queries)
   { return mService.search(queries); }
   ...
```

These annotations ensure the HTTP GET & POST requests are properly transformed into Java method calls

Structure & Functionality of the ZippyService

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- ZippyService defines implementation methods called by ZippyController

```
@Service
public class ZippyService {
   @Autowired
   private ZippyQuoteRepository mRepository;

   ...
```

See quoteservices/microservices/zippy/ZippyService.java

Structure & Functionality of the ZippyService

- ZippyService defines implementation methods called by ZippyController

```
@Service
public class ZippyService {
   @Autowired
   private ZippyQuoteRepository mRepository;

   ...
```

This annotation indicates the class implements "business logic" & enables auto-detection & wiring of dependent classes via classpath scanning

See www.baeldung.com/spring-component-repository-service

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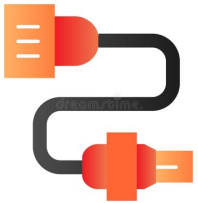

This field is auto-wired by Spring's dependency injection framework

See www.baeldung.com/spring-autowire

Structure & Functionality of the ZippyService

- ZippyService defines implementation methods called by ZippyController

```
@Service
public class ZippyService {
  public Flux<Quote> postQuotes(List<Integer> quoteIds) {
    return Flux.fromIterable(mRepository.findAllById(quoteIds));
  }

  public Flux<Quote> search(List<String> queries) {
    return Flux.fromIterable(queries).parallel()...;
  }

  public Flux<Quote> searchEx(List<String> queries) {
    return Flux.fromIterable(mRepository
                .findAllByQuoteContainingAllIn(queries));
  } ...
```

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public class ZippyService {
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  public Flux<Quote> searchEx(List<String> queries) {
    return Flux.fromIterable(mRepository
                .findAllByQuoteContainingAllIn(queries));
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```

All methods return the Flux reactive type

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  public Flux<Quote> searchEx(List<String> queries) {
    return Flux.fromIterable(mRepository
                .findAllByQuoteContainingAllIn(queries));
  } ...
```

All methods forward to the ZippyQuoteRepository

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                .findAllByQuoteContainingAllIn(queries));
  }...
```

This method does a bit more processing

See upcoming part of lesson on "*Implementing the ZippyService*"

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```
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public class ZippyService {
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    return Flux.fromIterable(mRepository
                .findAllByQuoteContainingAllIn(queries));
  } ...
```

Each List is encapsulated by a Flux, but this is a limited hybrid approach..

End of the QuoteServices App Case Study: Zippy MicroService Structure & Functionality (Part 1)