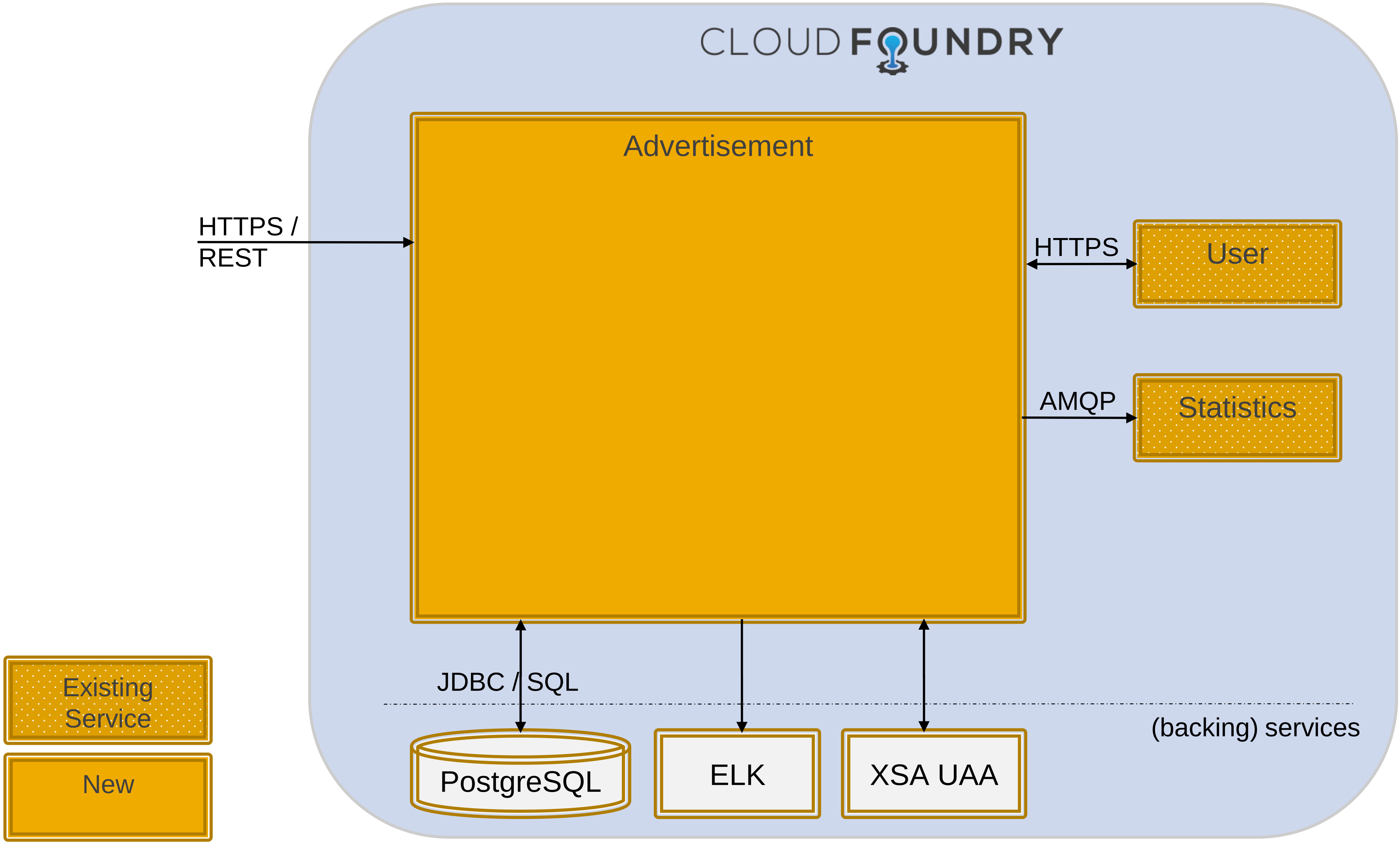


CLOUD FOUNDRY

Advertisement

HTTPS / REST

HTTPS

User

AMQP

Statistics

JDBC / SQL

(backing) services

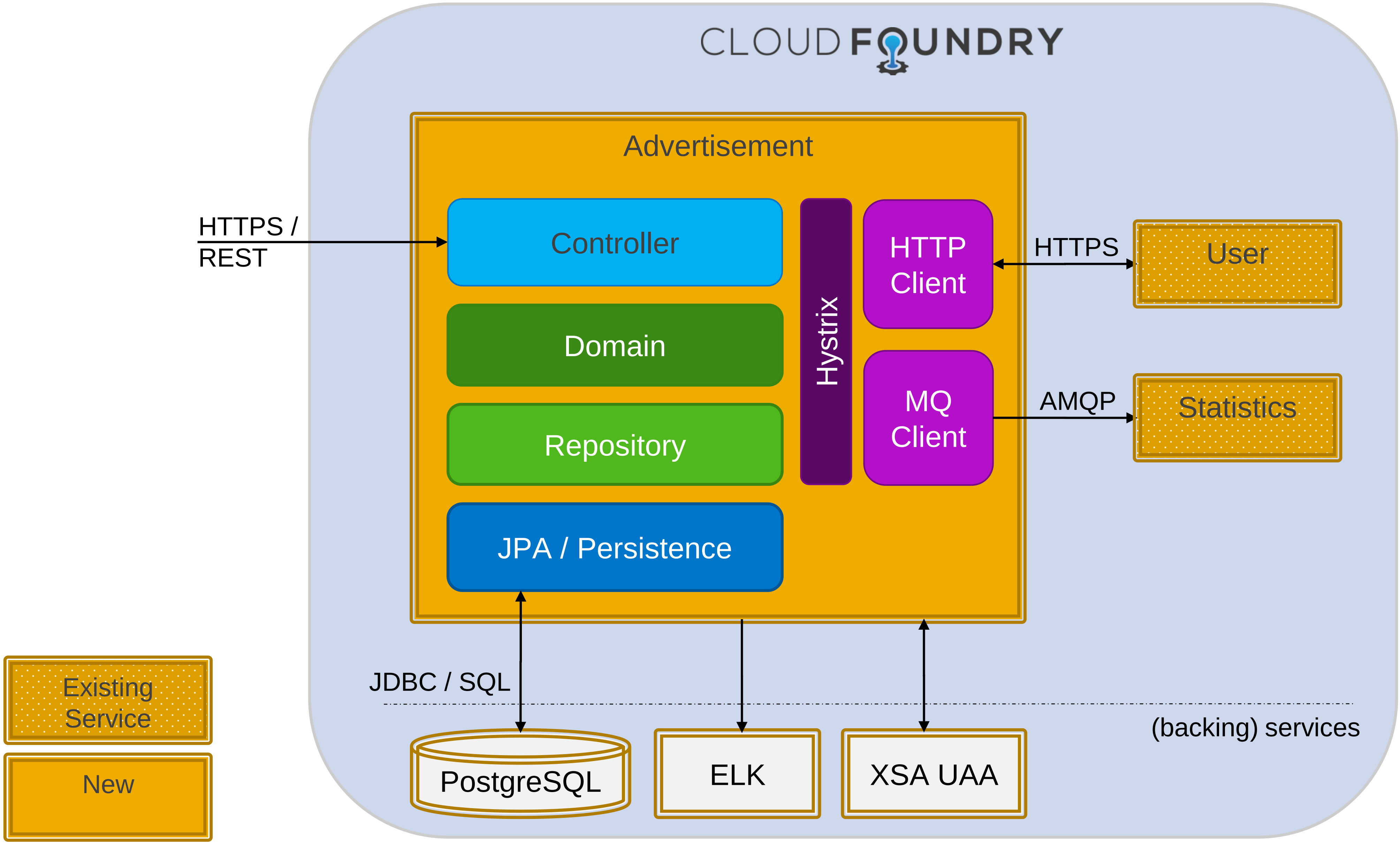
PostgreSQL

ELK

XSA UAA

Existing Service

New



CLOUDFOUNDRY

Advertisement

HTTPS / REST

Controller

Domain

Repository

JPA / Persistence

Hystrix

HTTP Client

MQ Client

HTTPS

User

AMQP

Statistics

JDBC / SQL

(backing) services

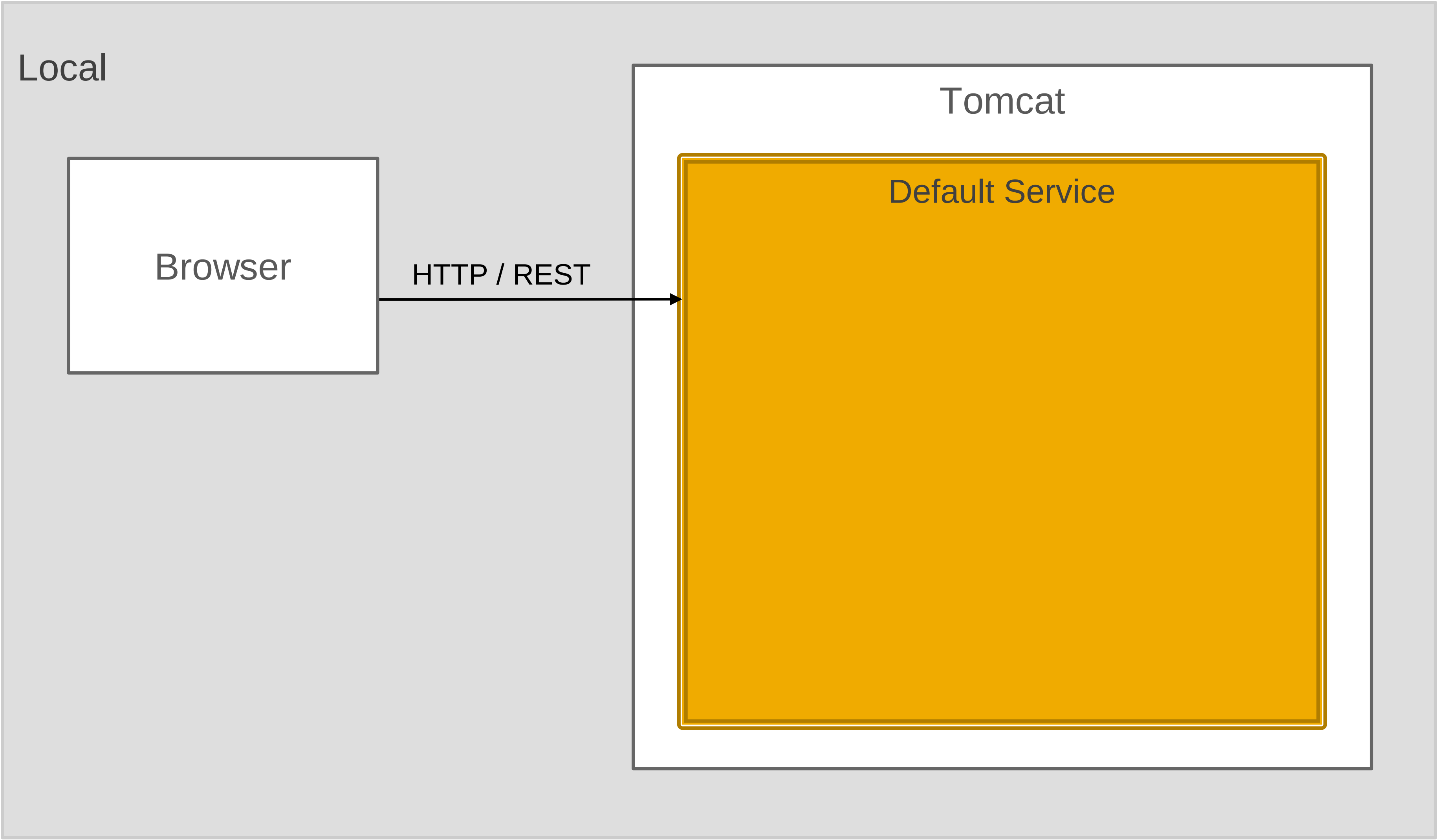
PostgreSQL

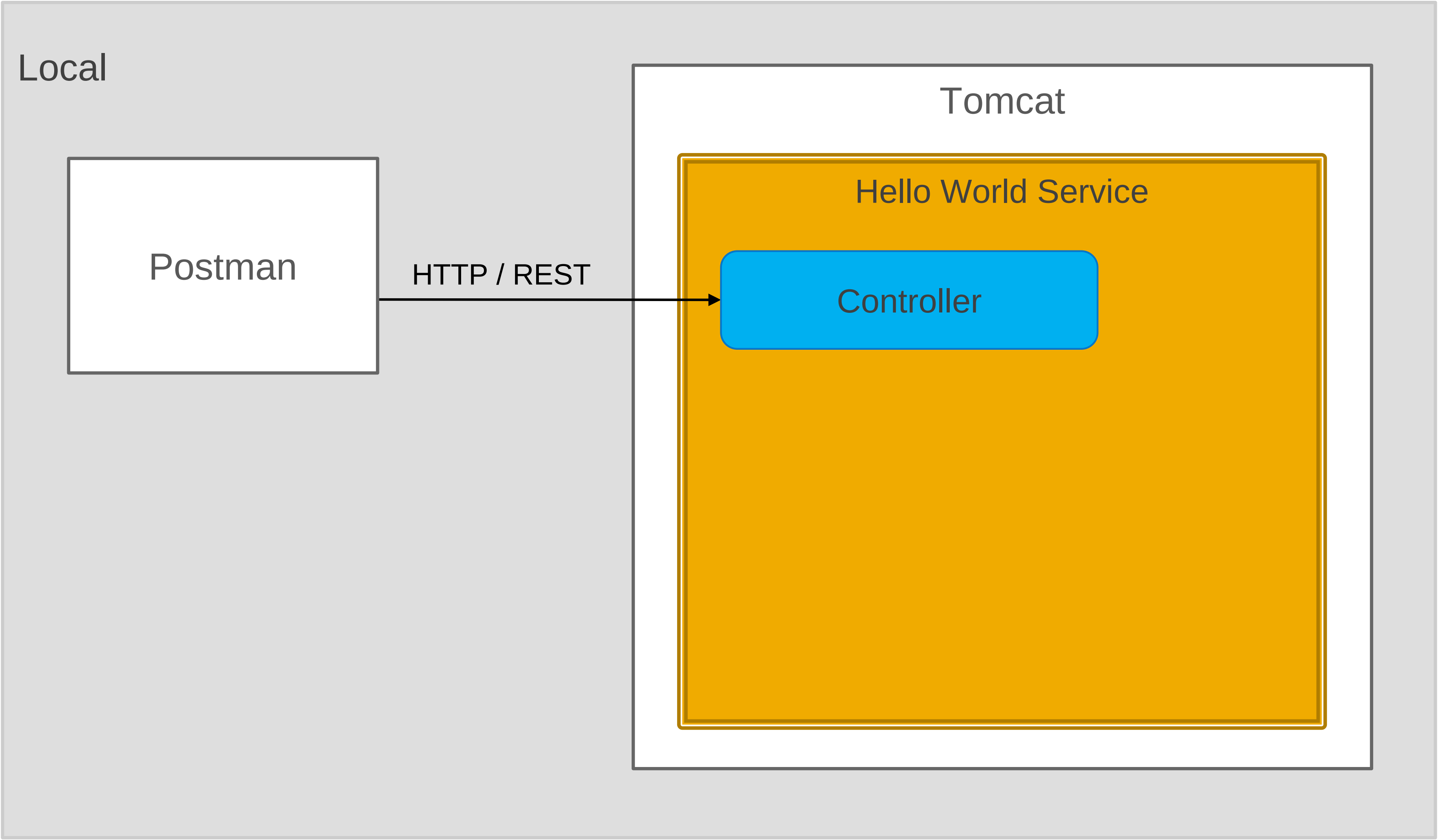
ELK

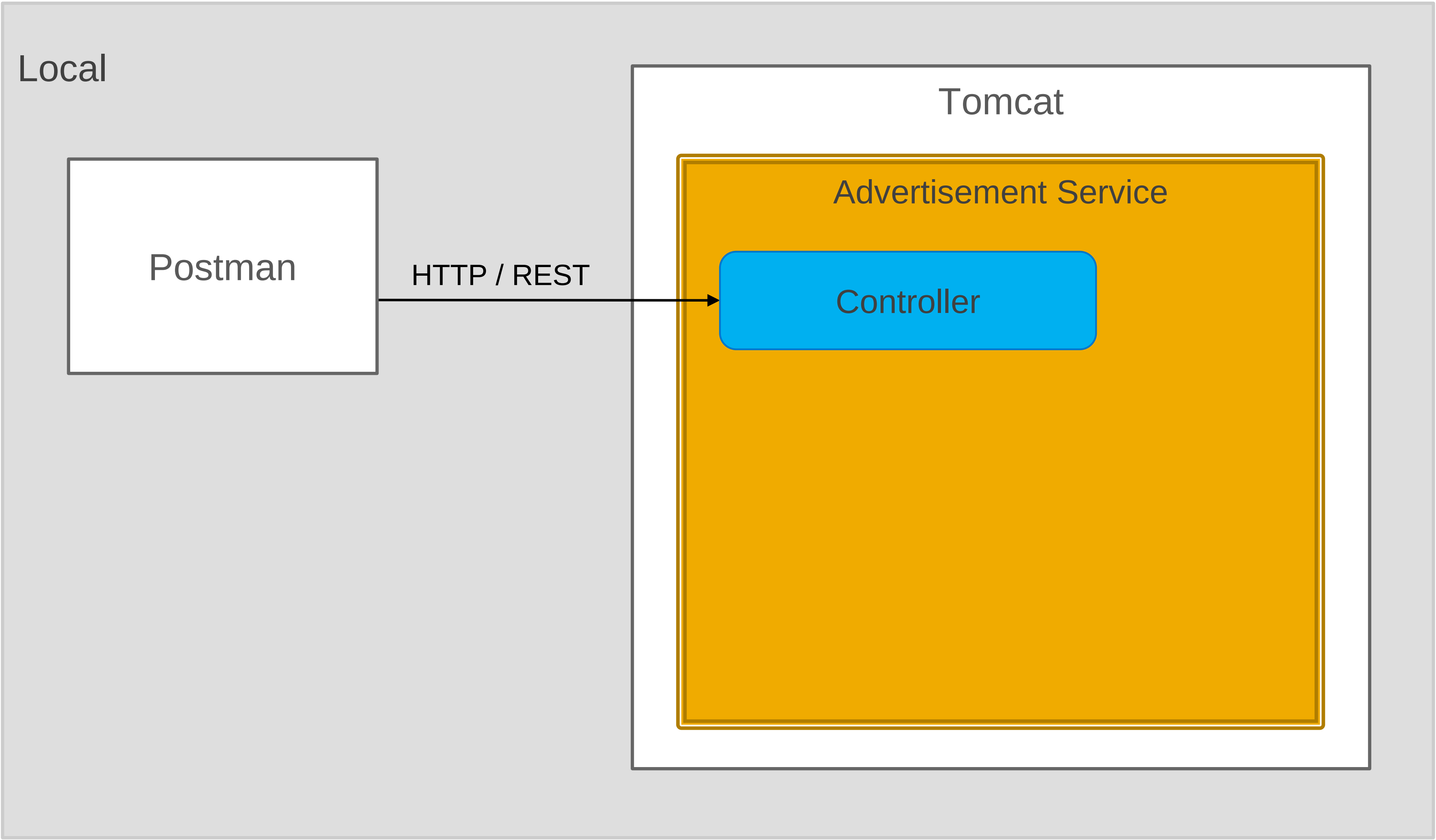
XSA UAA

Existing Service

New


Local
Tomcat
Browser
HTTP / REST
Default Service


Local
Tomcat
Hello World Service
Postman
HTTP / REST
Controller



Local

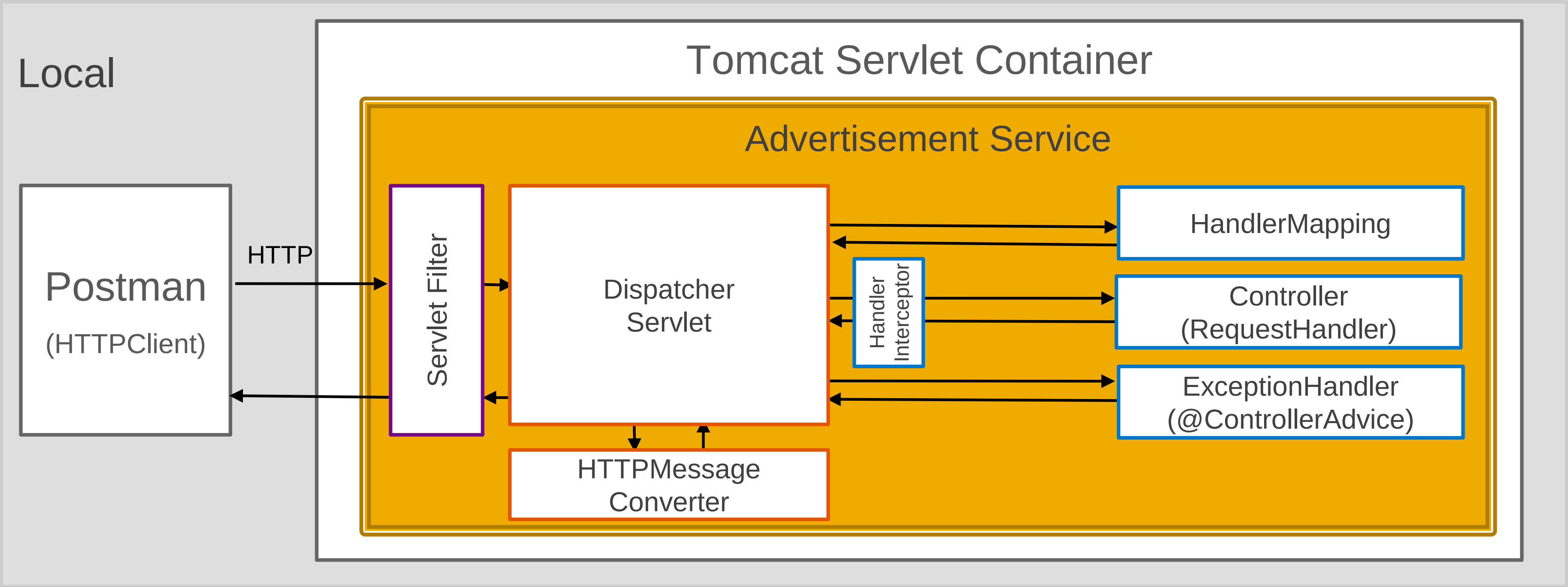
Postman

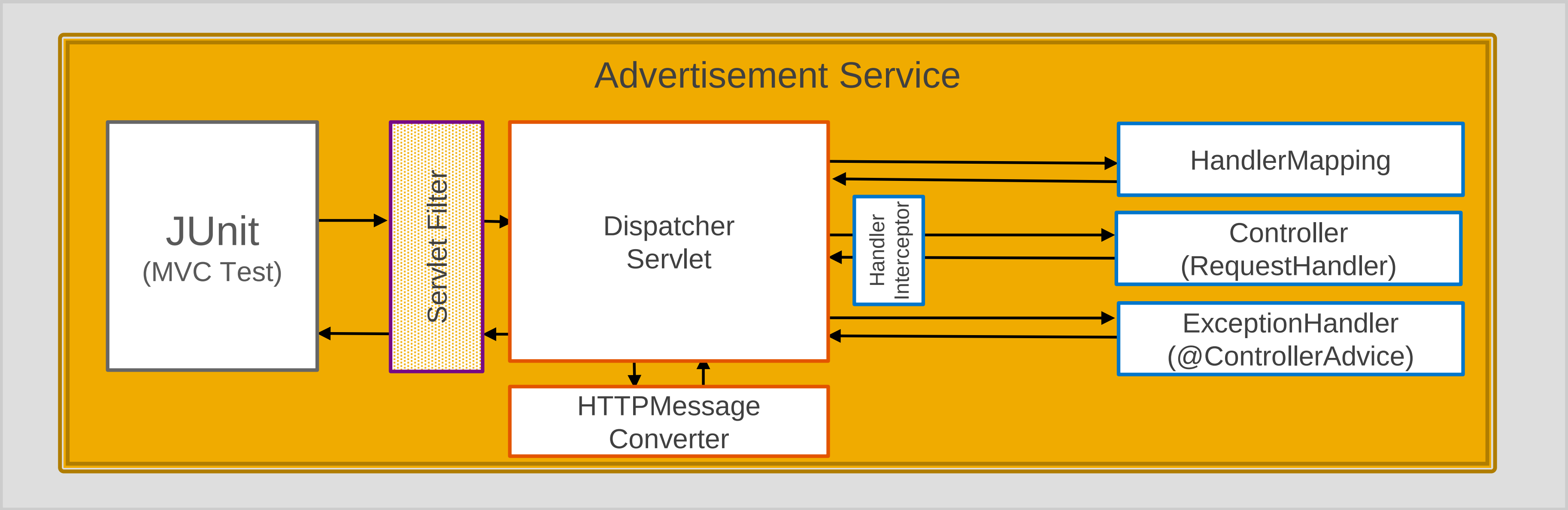
HTTP / REST

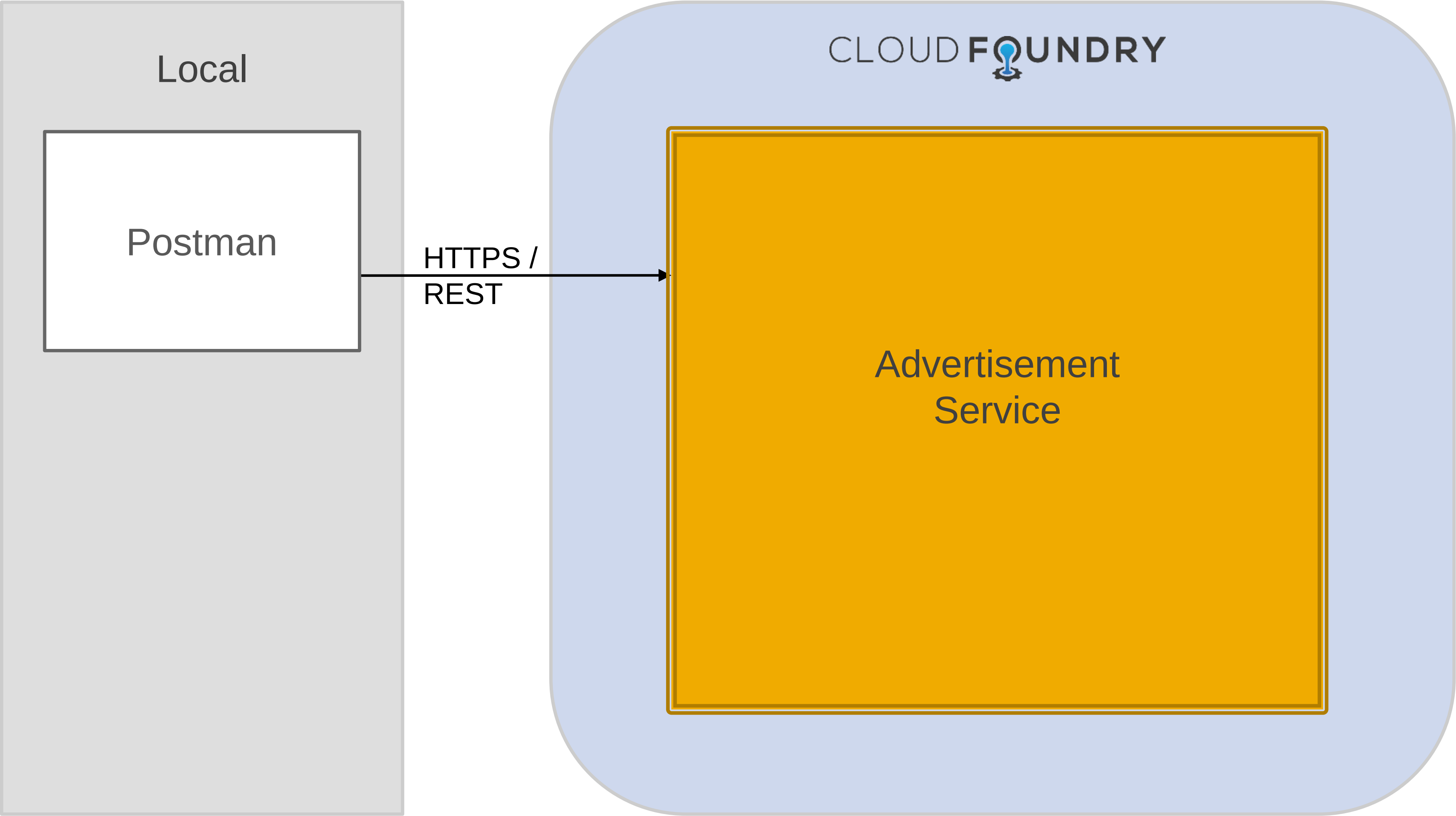
Tomcat

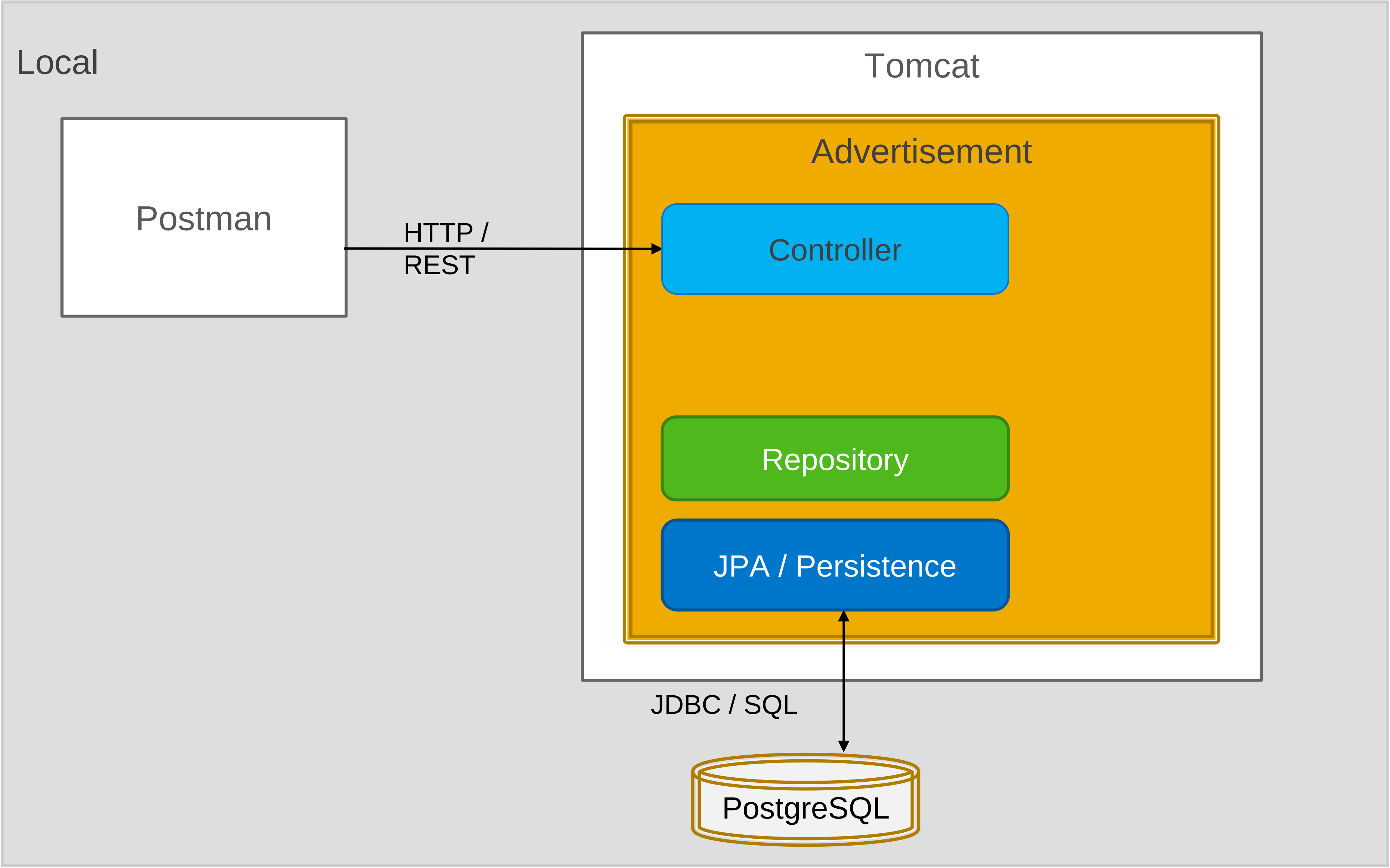
Advertisement Service

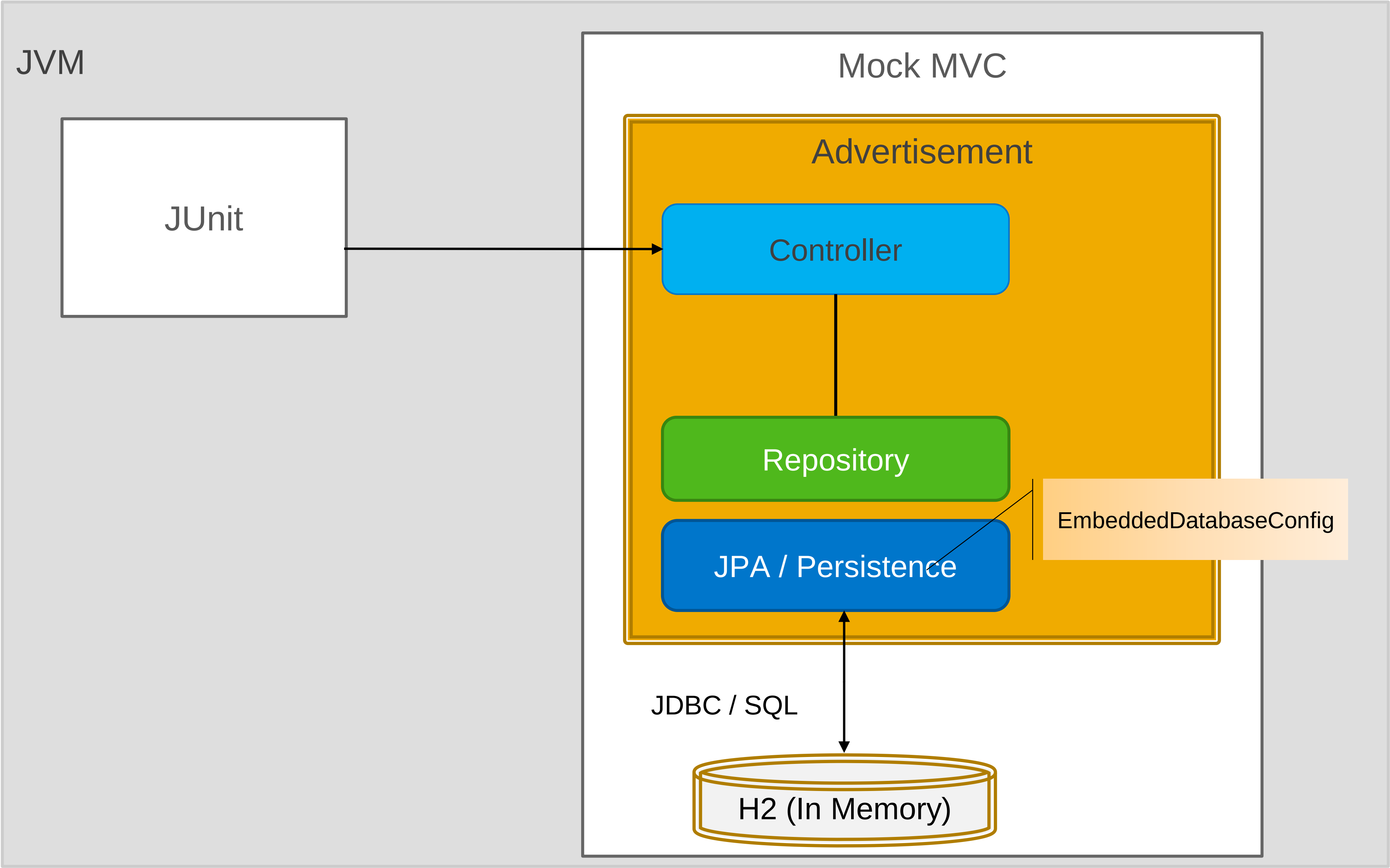
Controller

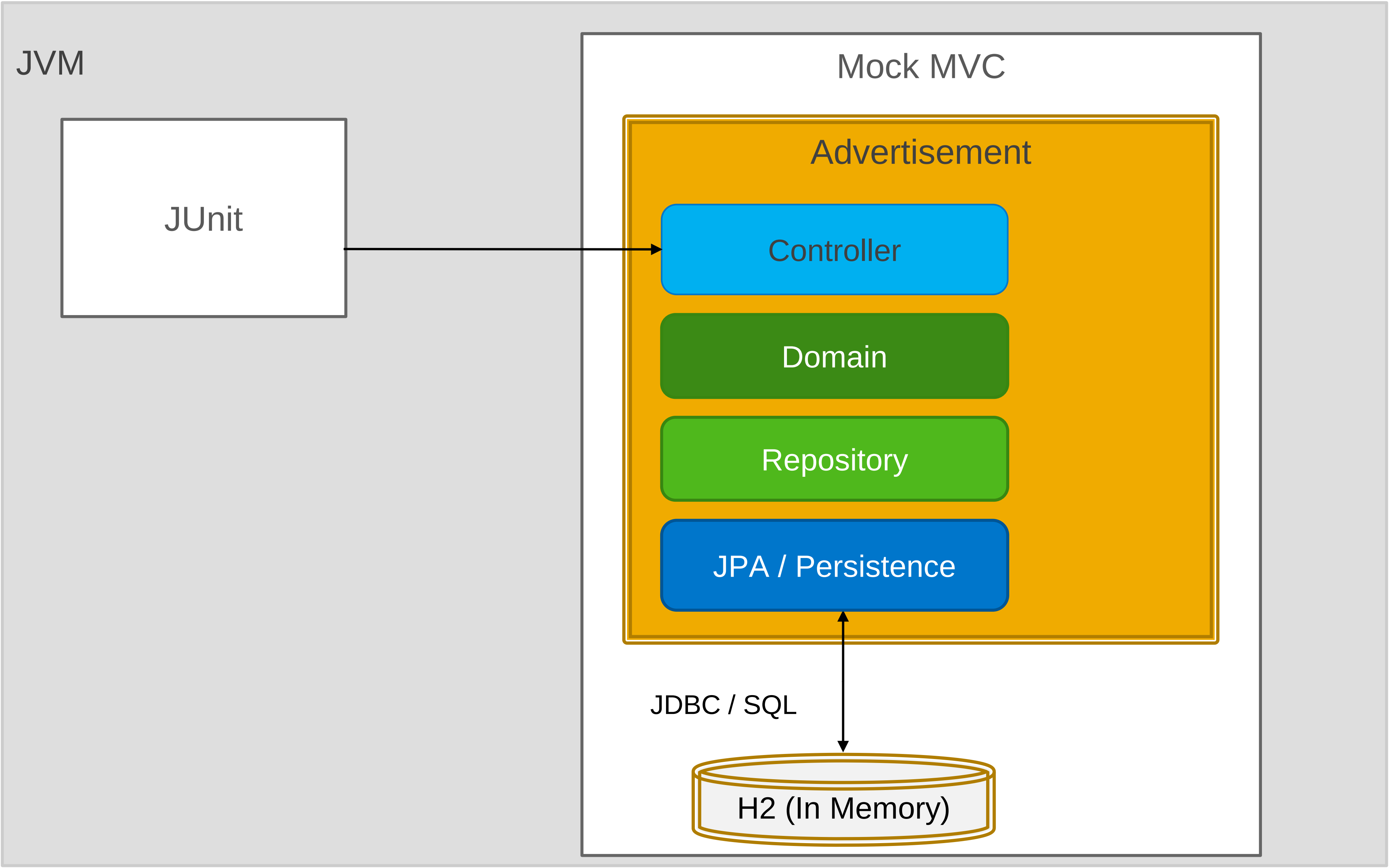

Local
Tomcat Servlet Container
Advertisement Service
Postman
(HTTPClient)
HTTP
Servlet Filter
Dispatcher Servlet
Handler Interceptor
HandlerMapping
Controller (RequestHandler)
ExceptionHandler (@ControllerAdvice)
HTTPMessage Converter

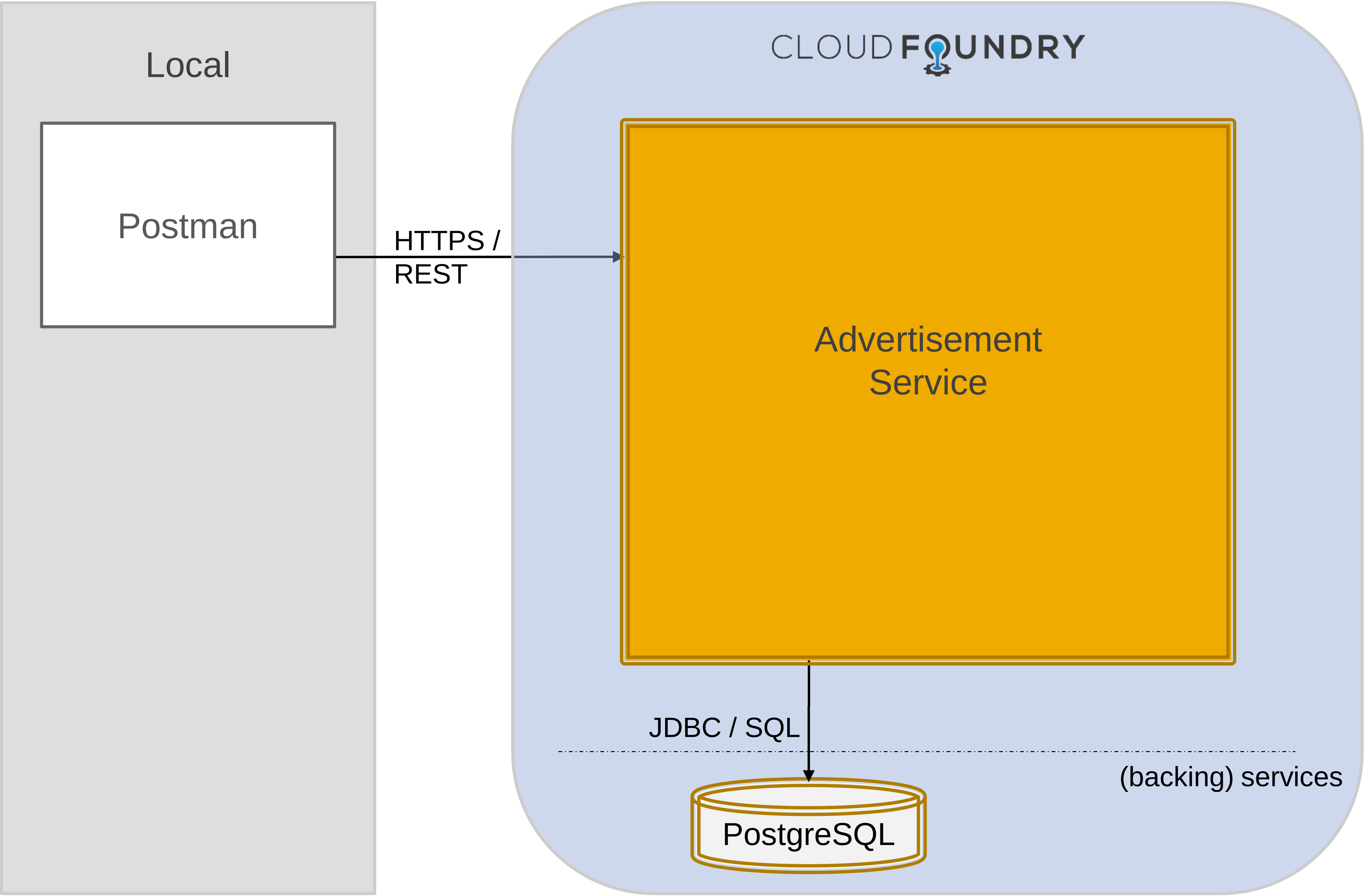

Advertisement Service
JUnit
(MVC Test)
Servlet Filter
Dispatcher Servlet
Handler Interceptor
HandlerMapping
Controller (RequestHandler)
ExceptionHandler (@ControllerAdvice)
HTTPMessage Converter


Local
Postman
HTTPS / REST
CLOUD FOUNDRY
Advertisement Service


Local
Tomcat
Postman
Advertisement
HTTP /
REST
Controller
Repository
JPA / Persistence
JDBC / SQL
PostgreSQL


JVM
Mock MVC
JUnit
Advertisement
Controller
Repository
EmbeddedDatabaseConfig
JPA / Persistence
JDBC / SQL
H2 (In Memory)


JVM
Mock MVC
JUnit
Advertisement
Controller
Domain
Repository
JPA / Persistence
JDBC / SQL
H2 (In Memory)



Local

Postman

HTTPS / REST

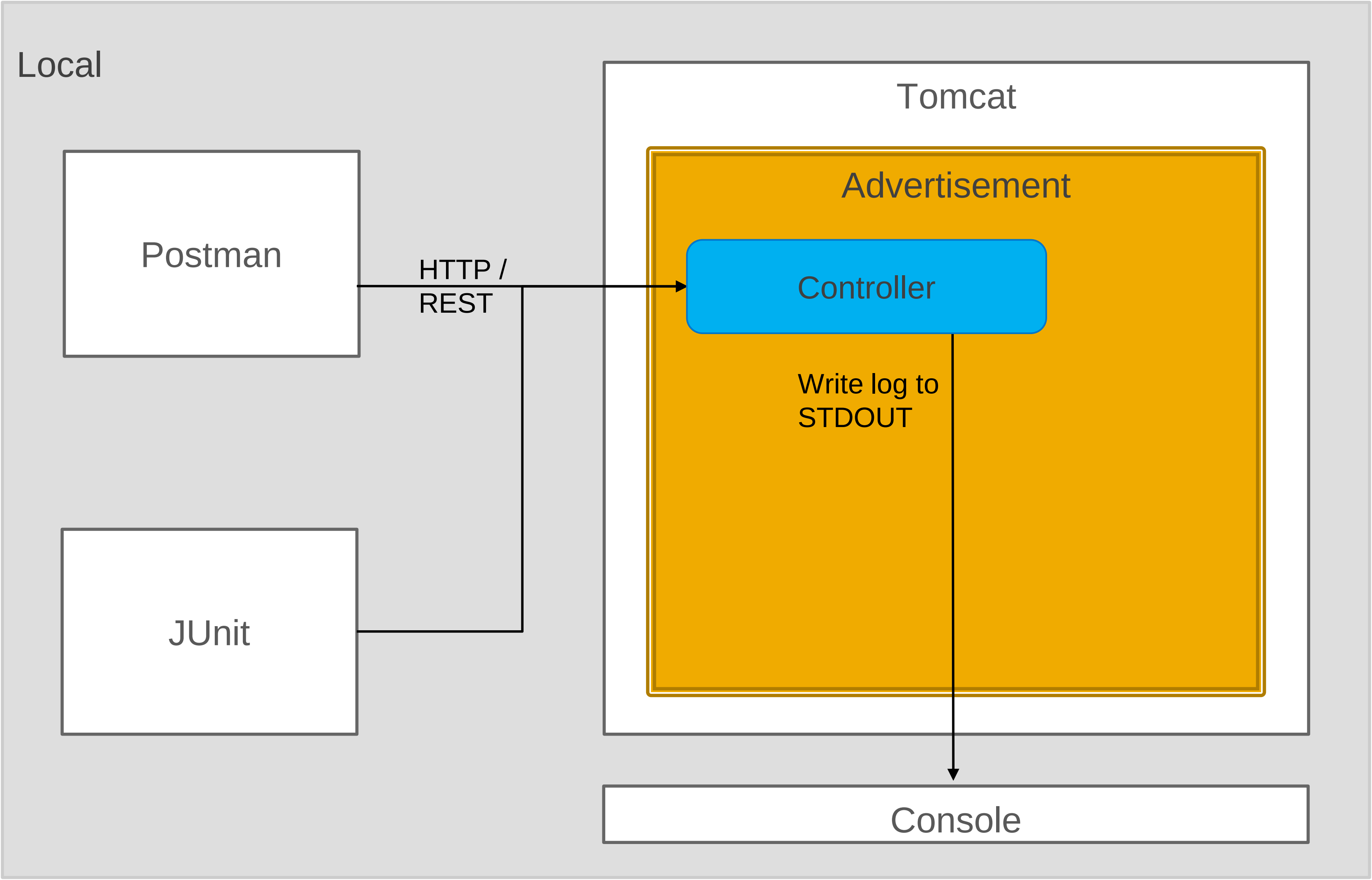
CLOUD FOUNDRY

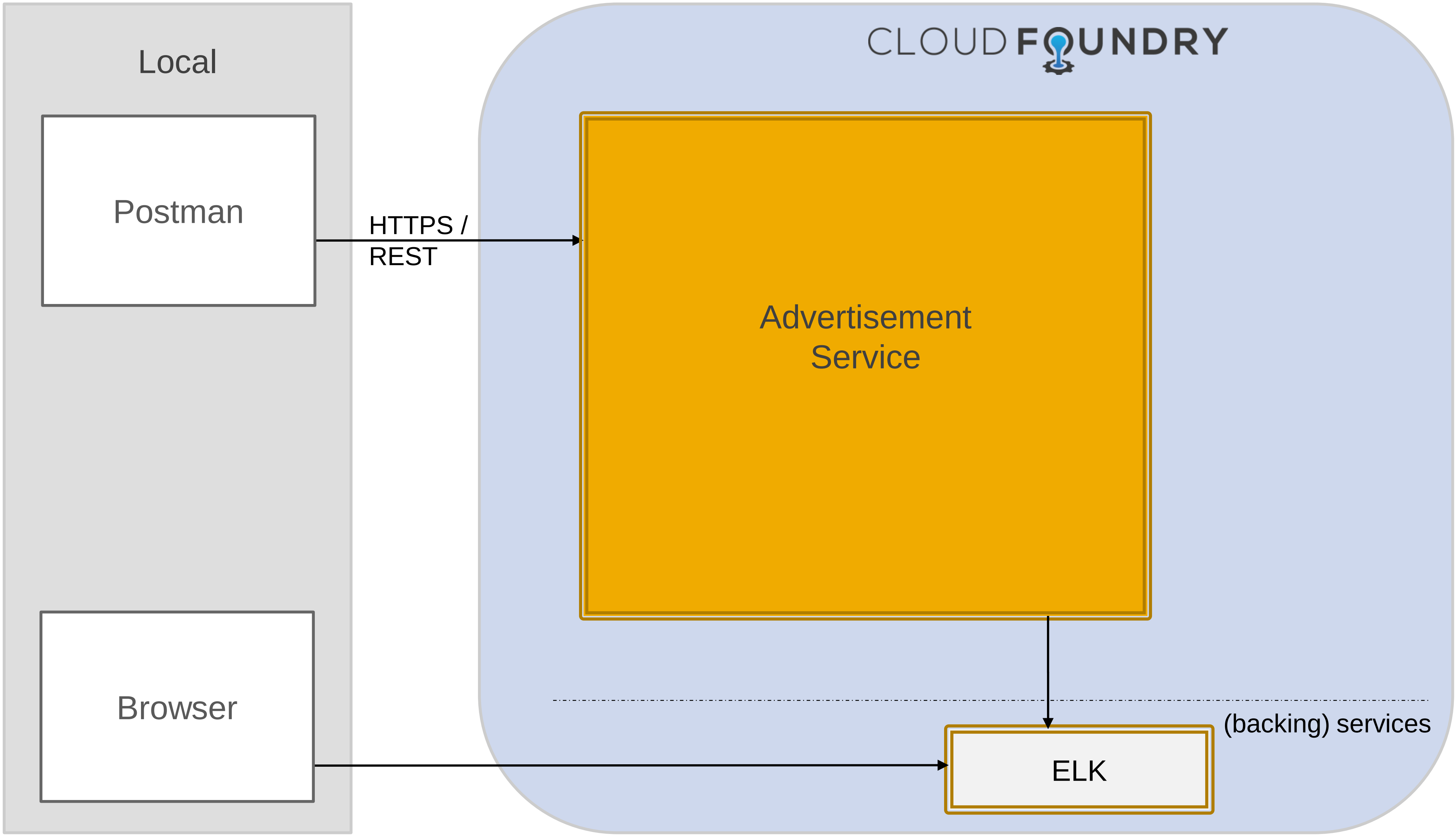
Advertisement Service

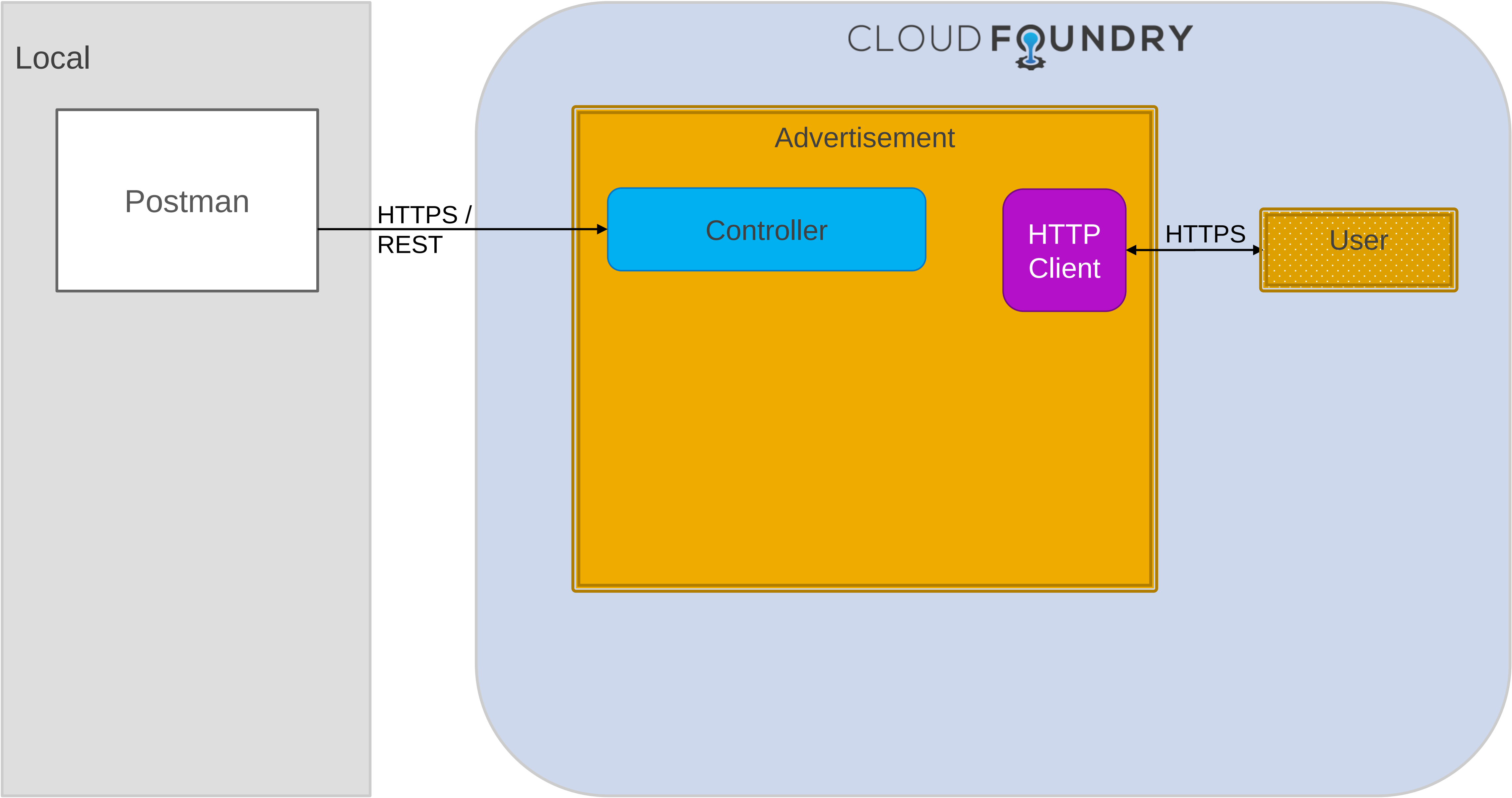
JDBC / SQL

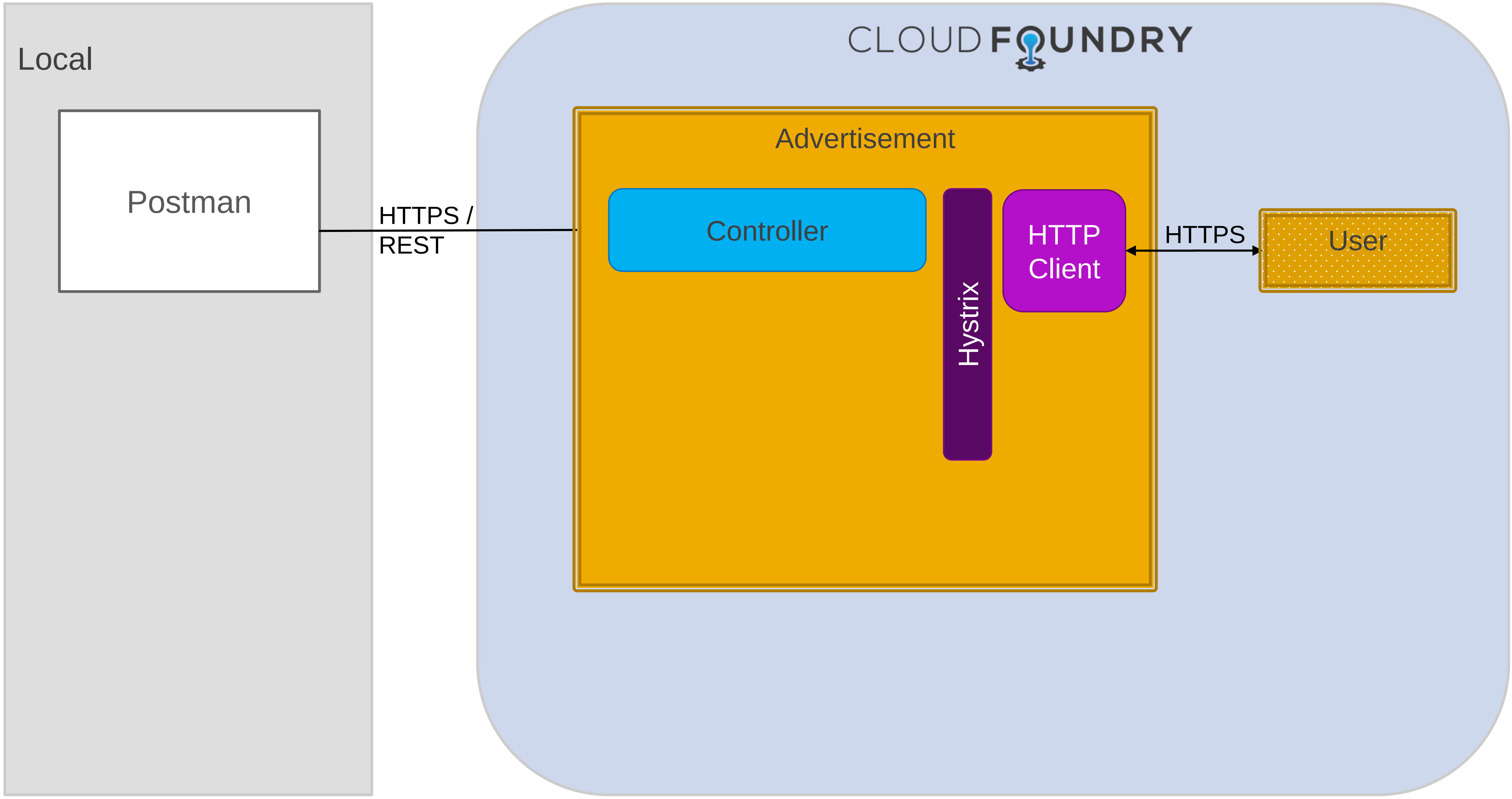
(backing) services

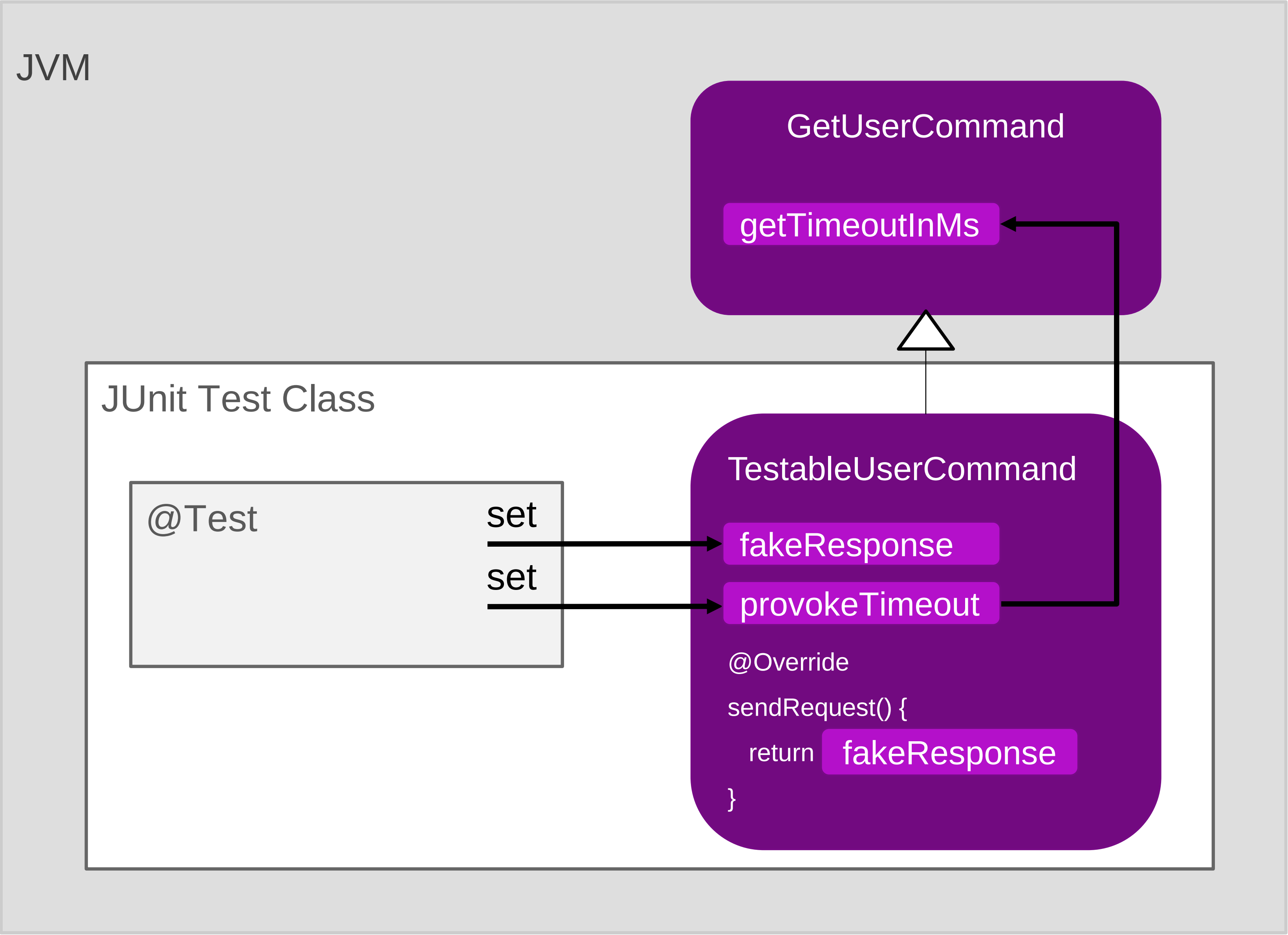
PostgreSQL

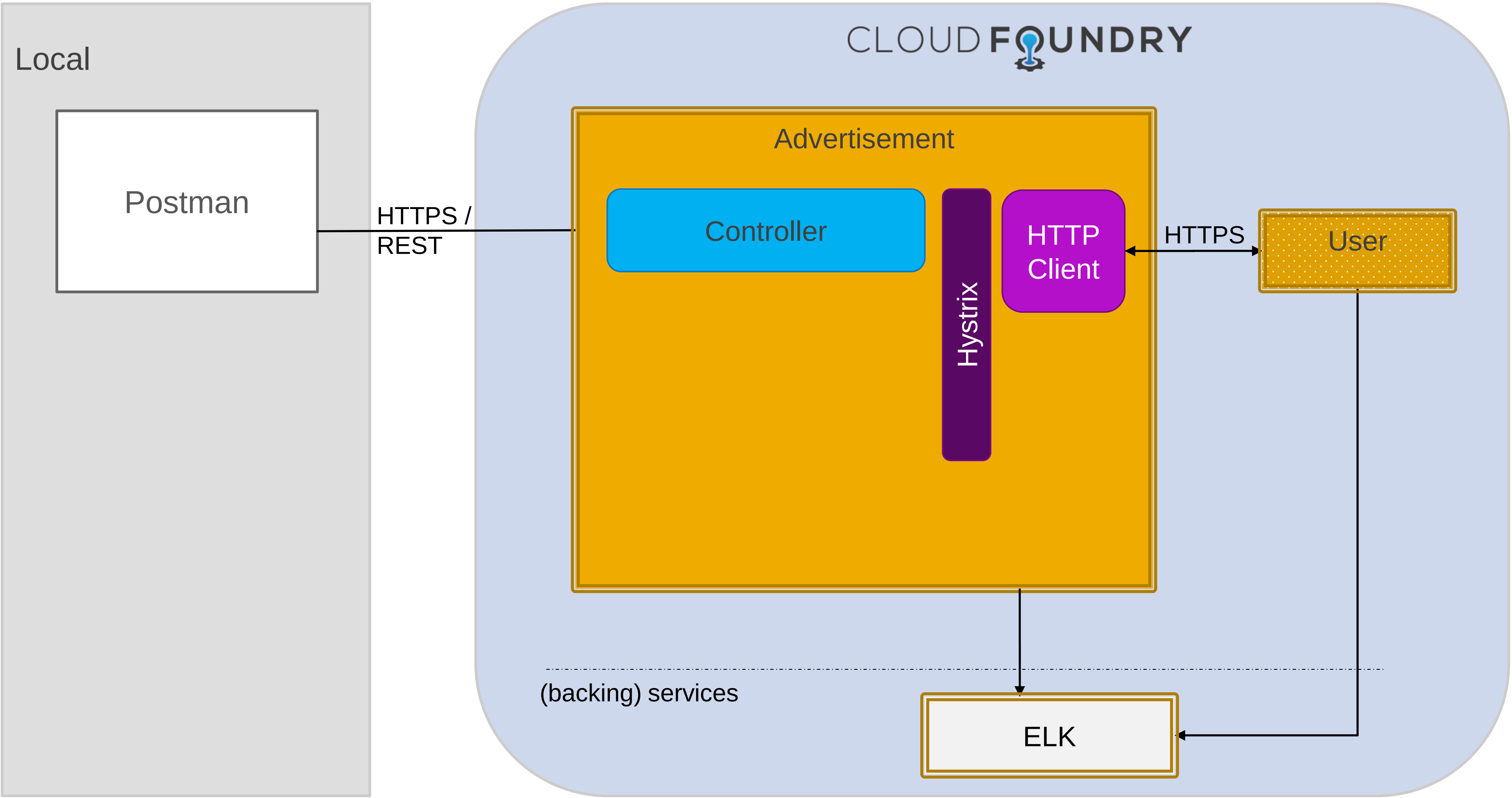

Local
Tomcat
Advertisement
Postman
HTTP / REST
Controller
Write log to STDOUT
JUnit
Console

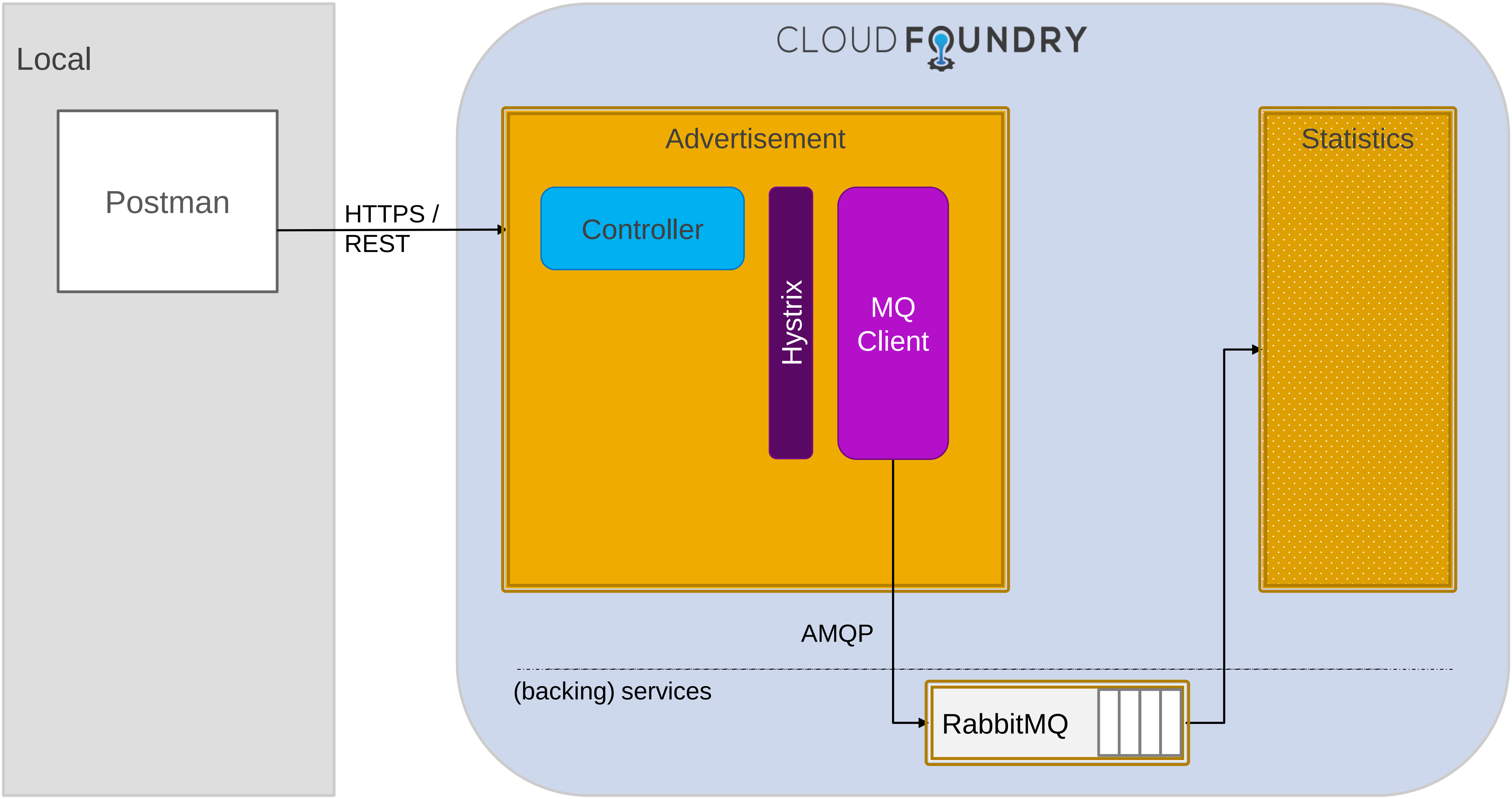

Local
Postman
Browser
HTTPS / REST
CLOUD FOUNDRY
Advertisement Service
(backing) services
ELK


Local
Postman
HTTPS /
REST
CLOUD FOUNDRY
Advertisement
Controller
HTTP
Client
HTTPS
User


Local
Postman
HTTPS /
REST
CLOUD FOUNDRY
Advertisement
Controller
Hystrix
HTTP
Client
HTTPS
User


JVM
GetUserCommand
getTimeoutInMs
JUnit Test Class
@Test
set
set
TestableUserCommand
fakeResponse
provokeTimeout
@Override
sendRequest() {
return fakeResponse
}


Local
Postman
HTTPS / REST
CLOUD FOUNDRY
Advertisement
Controller
Hystrix
HTTP Client
HTTPS
User
(backing) services
ELK



Local

Postman

HTTPS / REST

CLOUD FOUNDRY

Advertisement

Controller

Hystrix

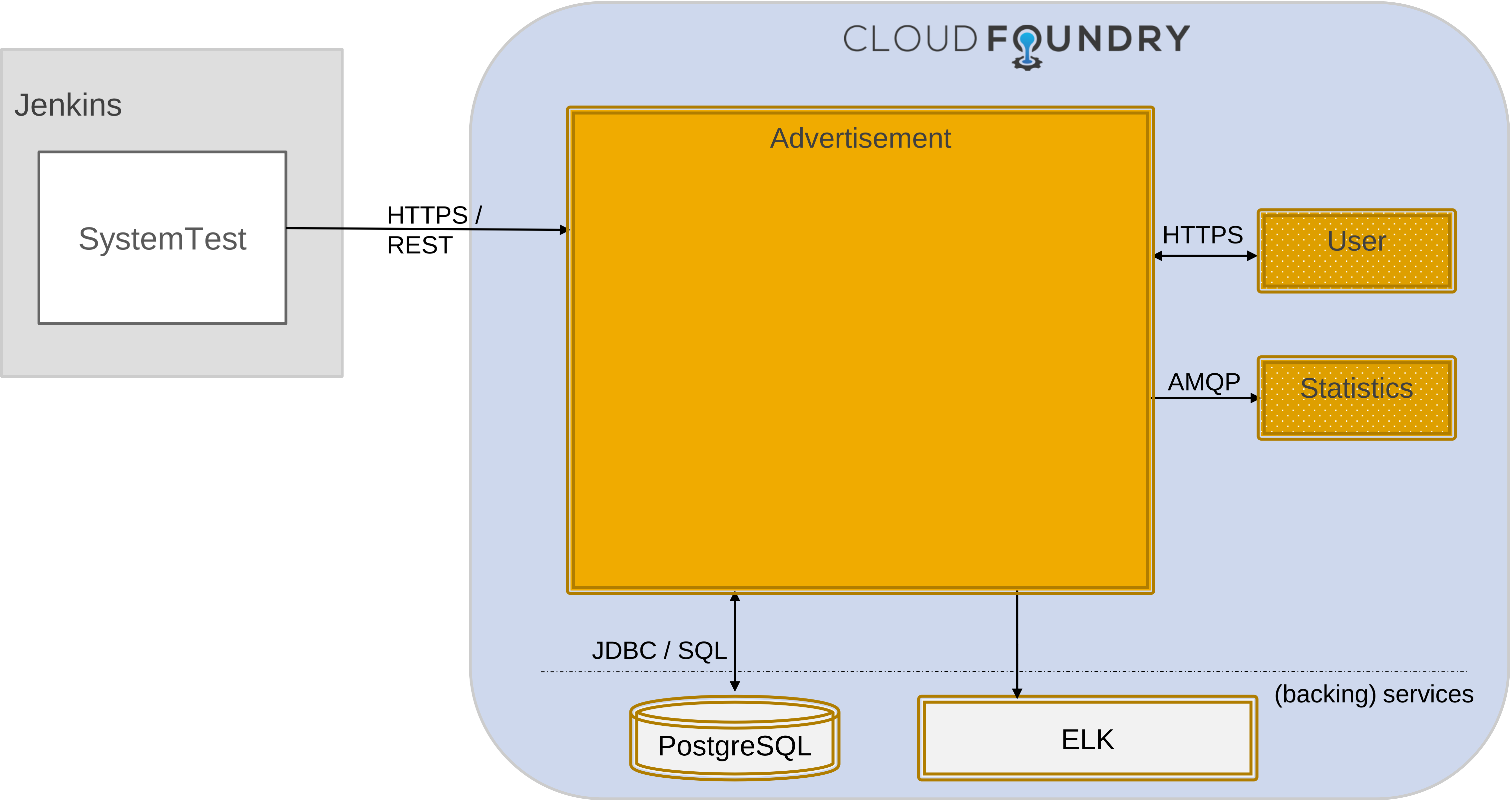
MQ Client

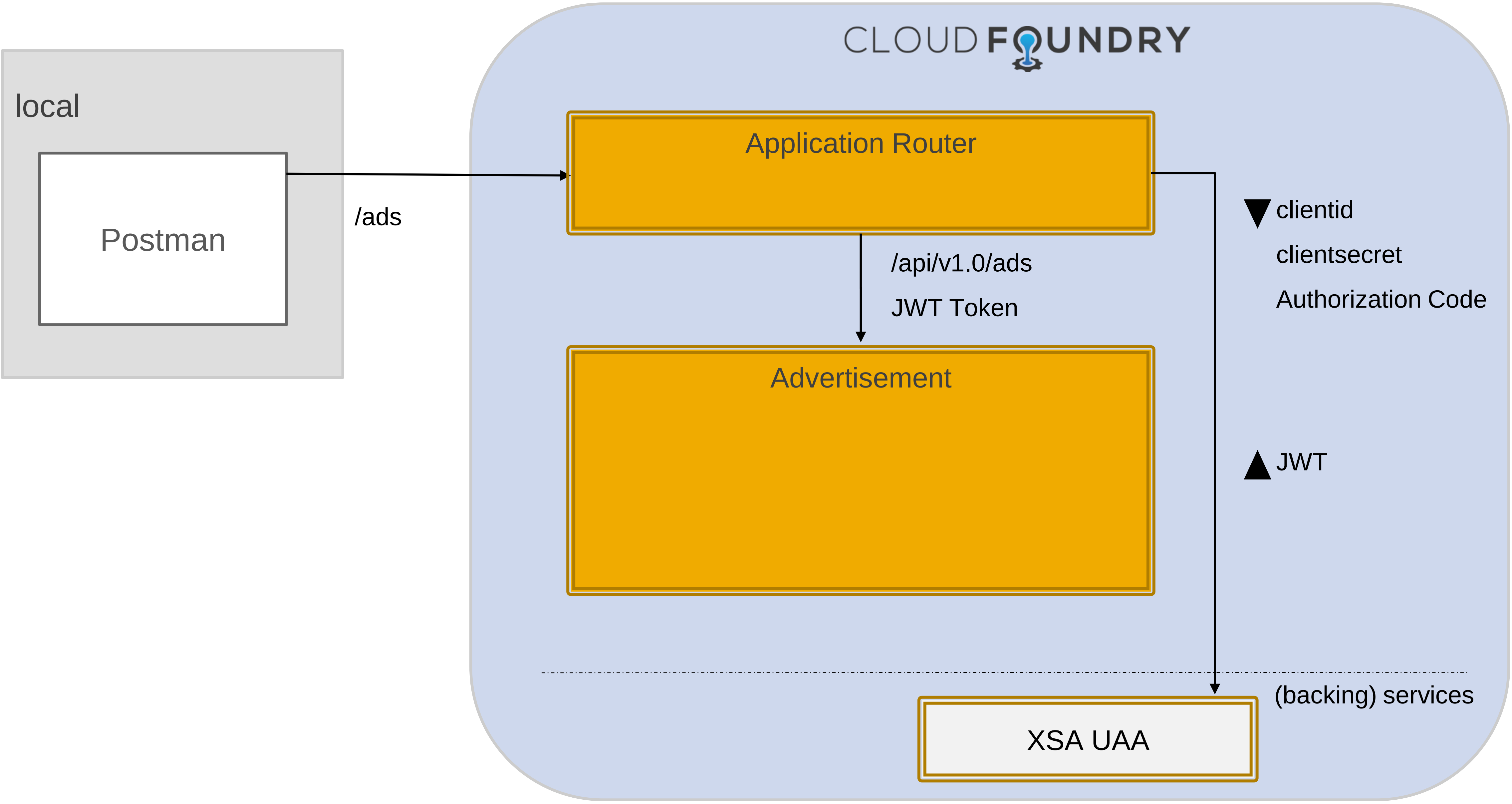
Statistics

AMQP

(backing) services

RabbitMQ


CLOUD FOUNDRY
Jenkins
SystemTest
HTTPS /
REST
Advertisement
HTTPS
User
AMQP
Statistics
JDBC / SQL
(backing) services
PostgreSQL
ELK



local

Postman

/ads

CLOUD FOUNDRY

Application Router

/api/v1.0/ads

JWT Token

Advertisement

▼ clientid

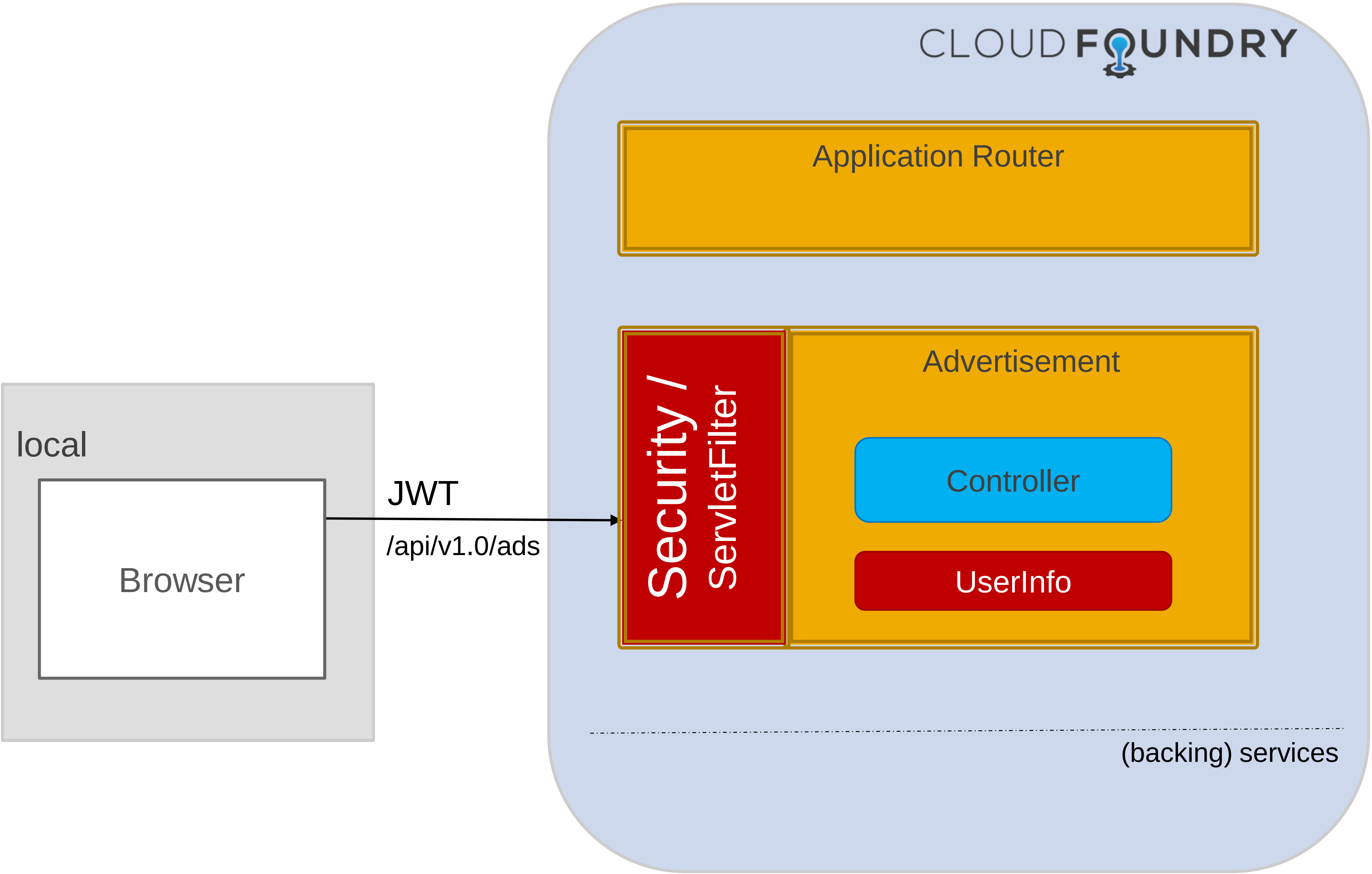
clientsecret

Authorization Code

▲ JWT

(backing) services

XSA UAA



CLOUD FOUNDRY

Application Router

Security / ServletFilter

Advertisement

Controller

UserInfo

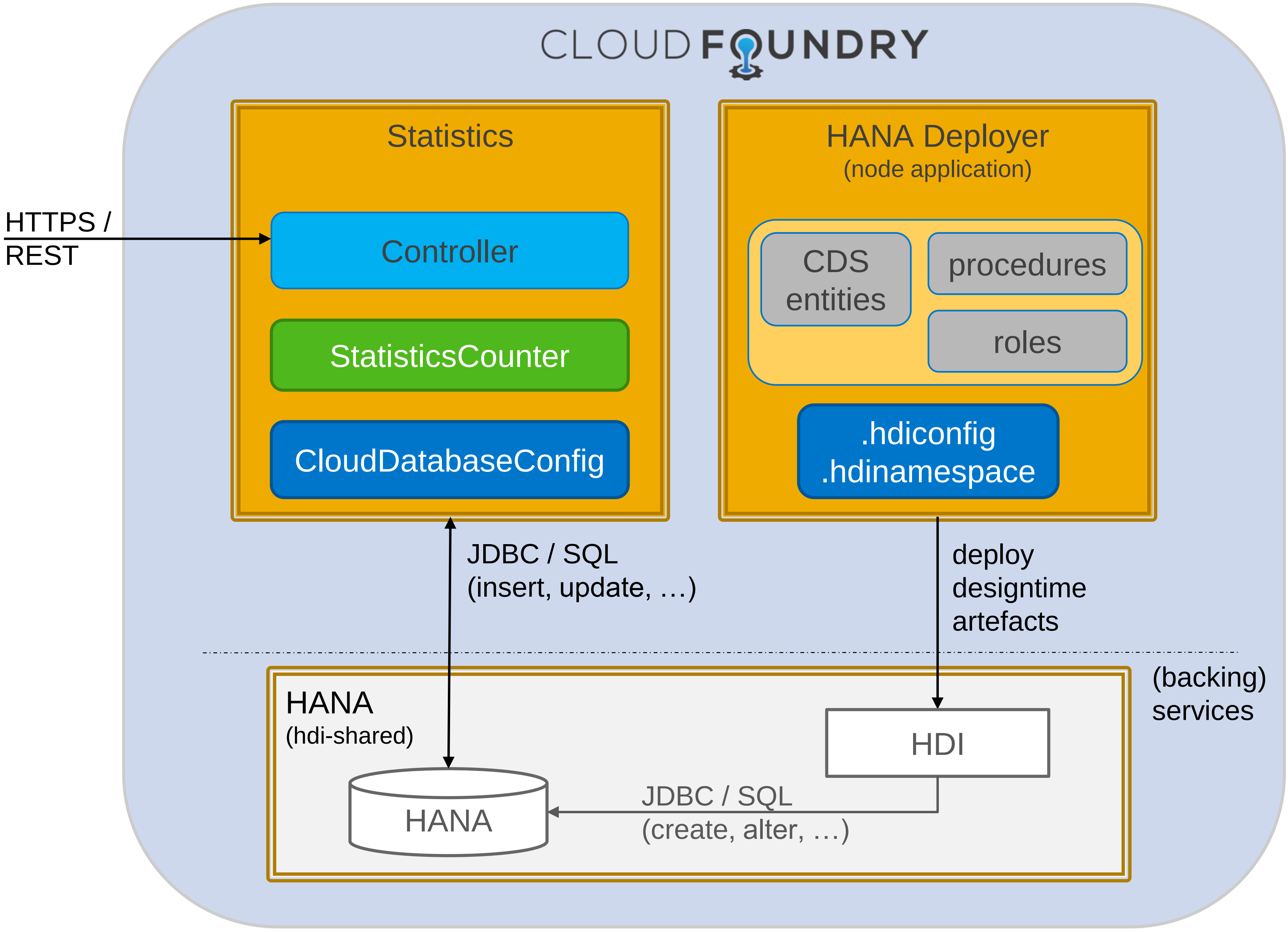
local

Browser

JWT

/api/v1.0/ads

(backing) services


CLOUD FOUNDRY

HTTPS / REST

Statistics

Controller

StatisticsCounter

CloudDatabaseConfig

HANA Deployer (node application)

CDS entities

procedures

roles

.hdiconfig .hdinamespace

JDBC / SQL (insert, update, …)

deploy designtime artefacts

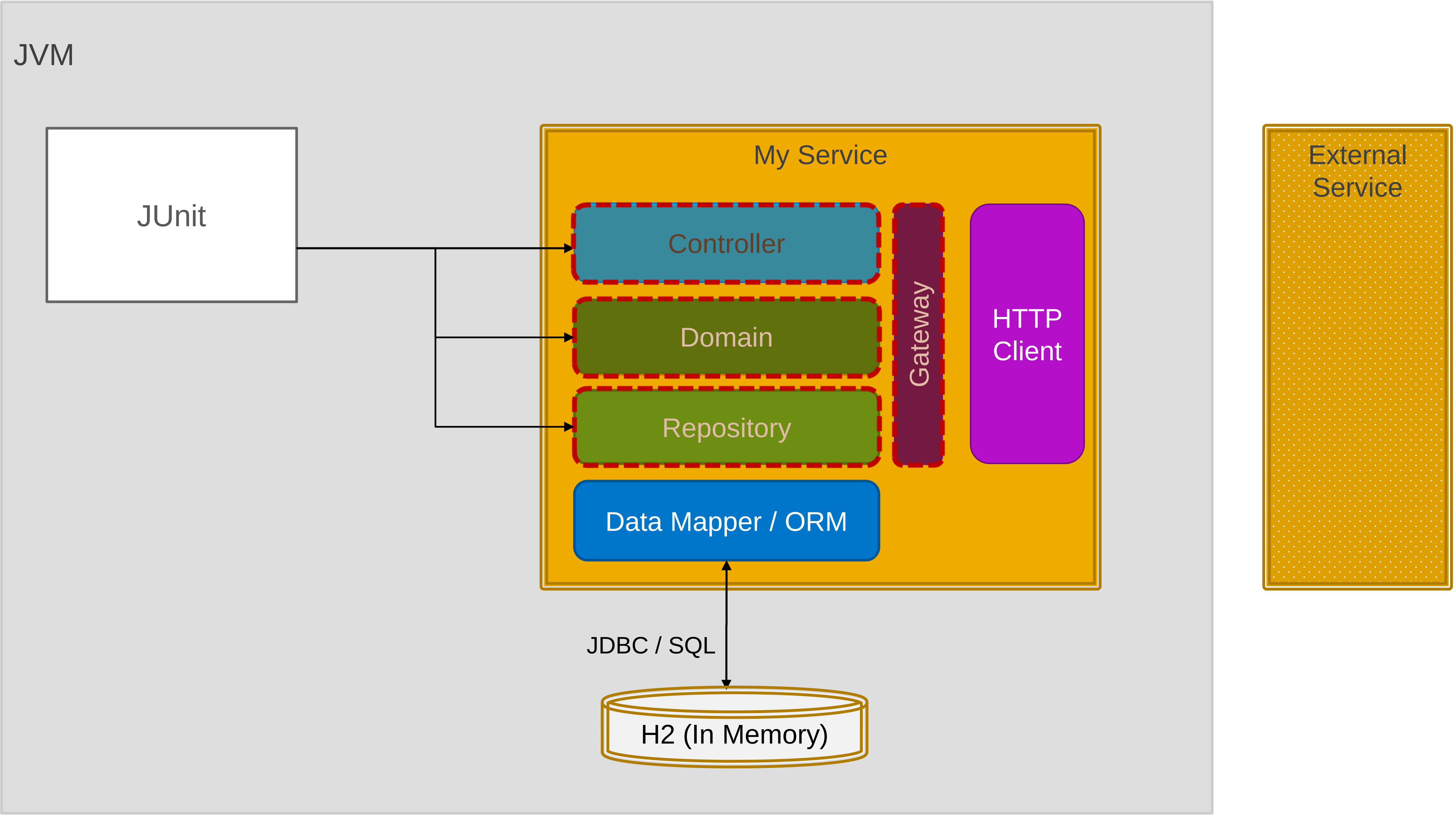
(backing) services

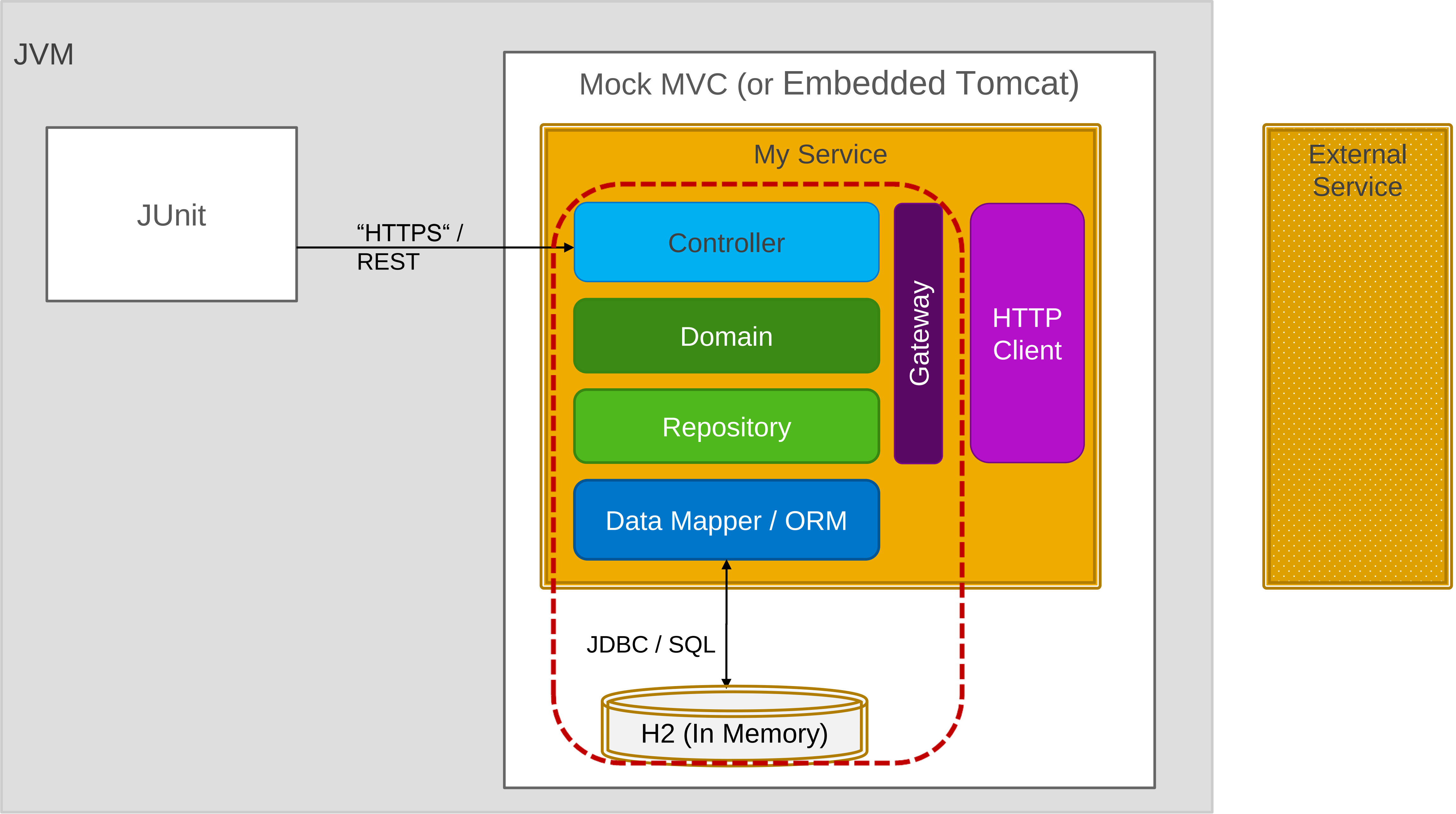
HANA (hdi-shared)

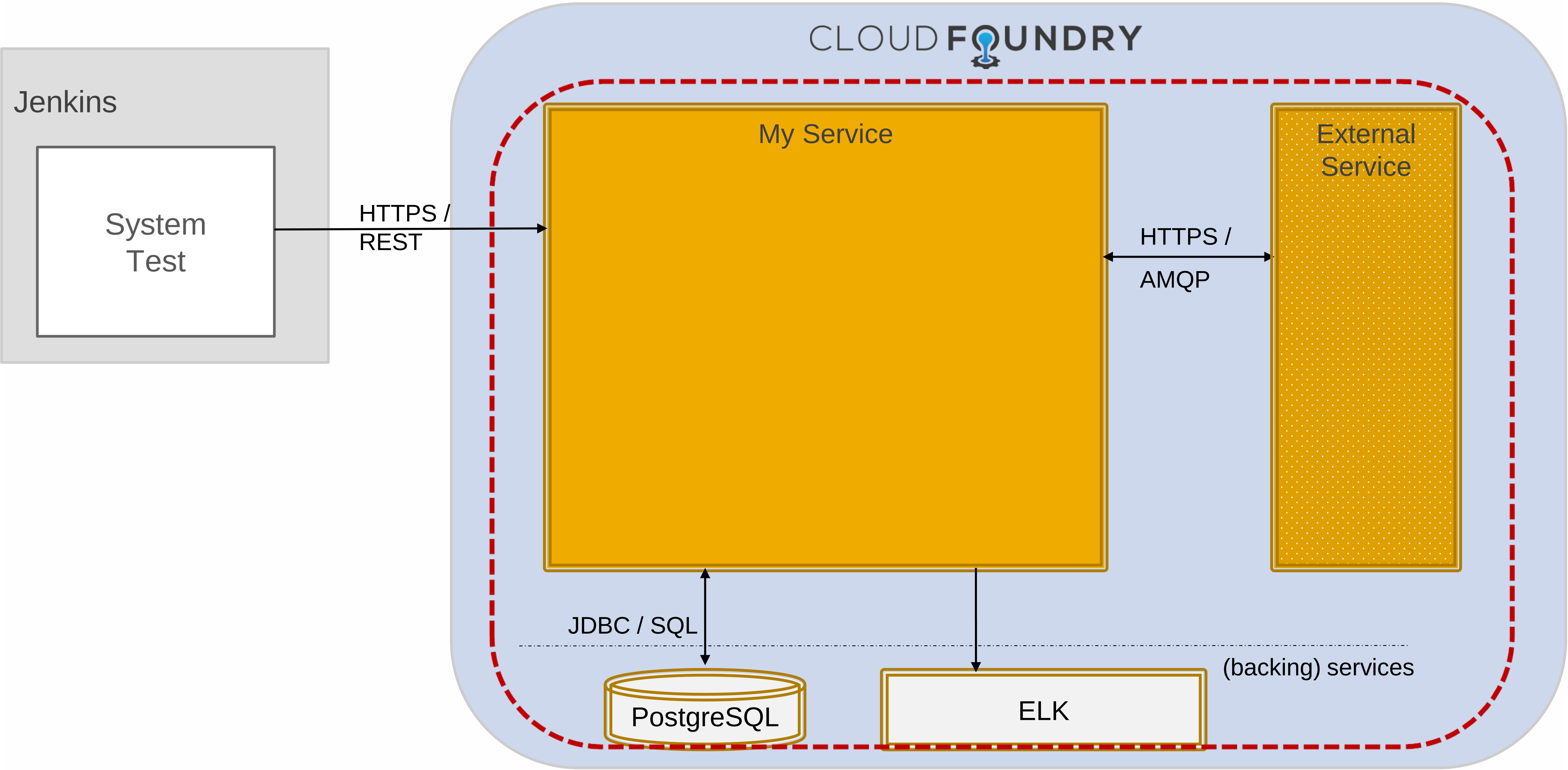
HDI

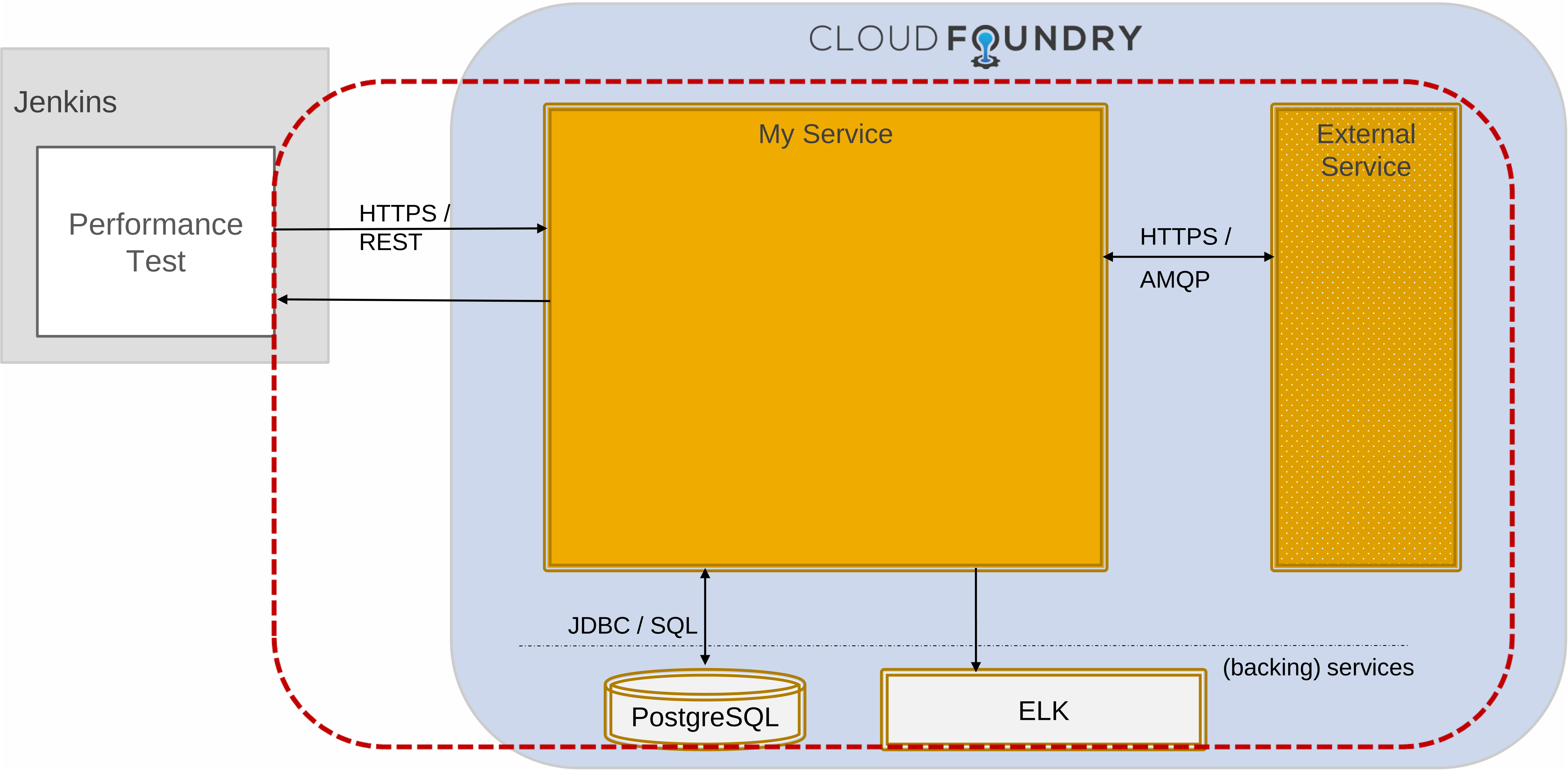
HANA

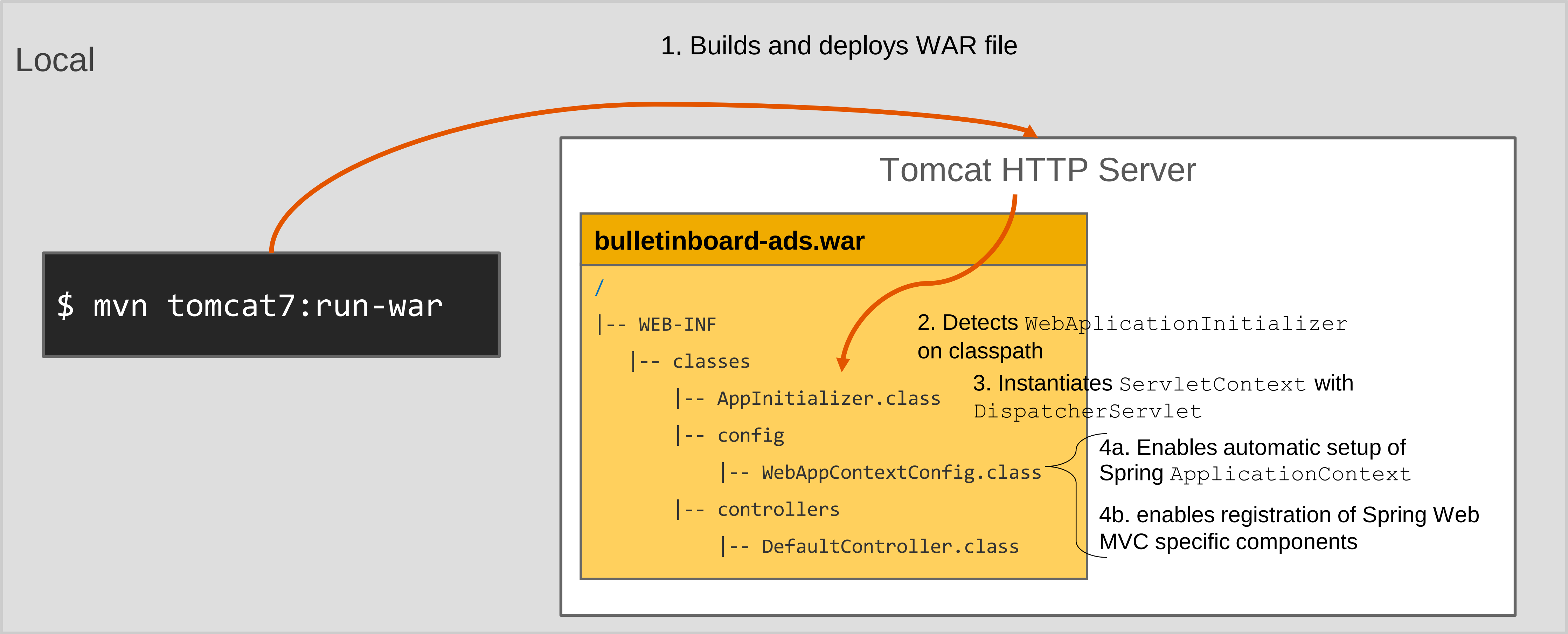
JDBC / SQL (create, alter, …)


JVM
JUnit
My Service
Controller
Domain
Repository
Gateway
HTTP Client
Data Mapper / ORM
JDBC / SQL
H2 (In Memory)
External Service


JVM
Mock MVC (or Embedded Tomcat)
JUnit
“HTTPS“ / REST
My Service
Controller
Domain
Repository
Data Mapper / ORM
Gateway
HTTP Client
JDBC / SQL
H2 (In Memory)
External Service


CLOUD FOUNDRY
Jenkins
System Test
HTTPS / REST
My Service
External Service
HTTPS / AMQP
JDBC / SQL
(backing) services
PostgreSQL
ELK


CLOUD FOUNDRY
Jenkins
Performance Test
HTTPS / REST
My Service
External Service
HTTPS / AMQP
JDBC / SQL
(backing) services
PostgreSQL
ELK



Local

1. Builds and deploys WAR file

```
$ mvn tomcat7:run-war
```

Tomcat HTTP Server

bulletinboard-ads.war

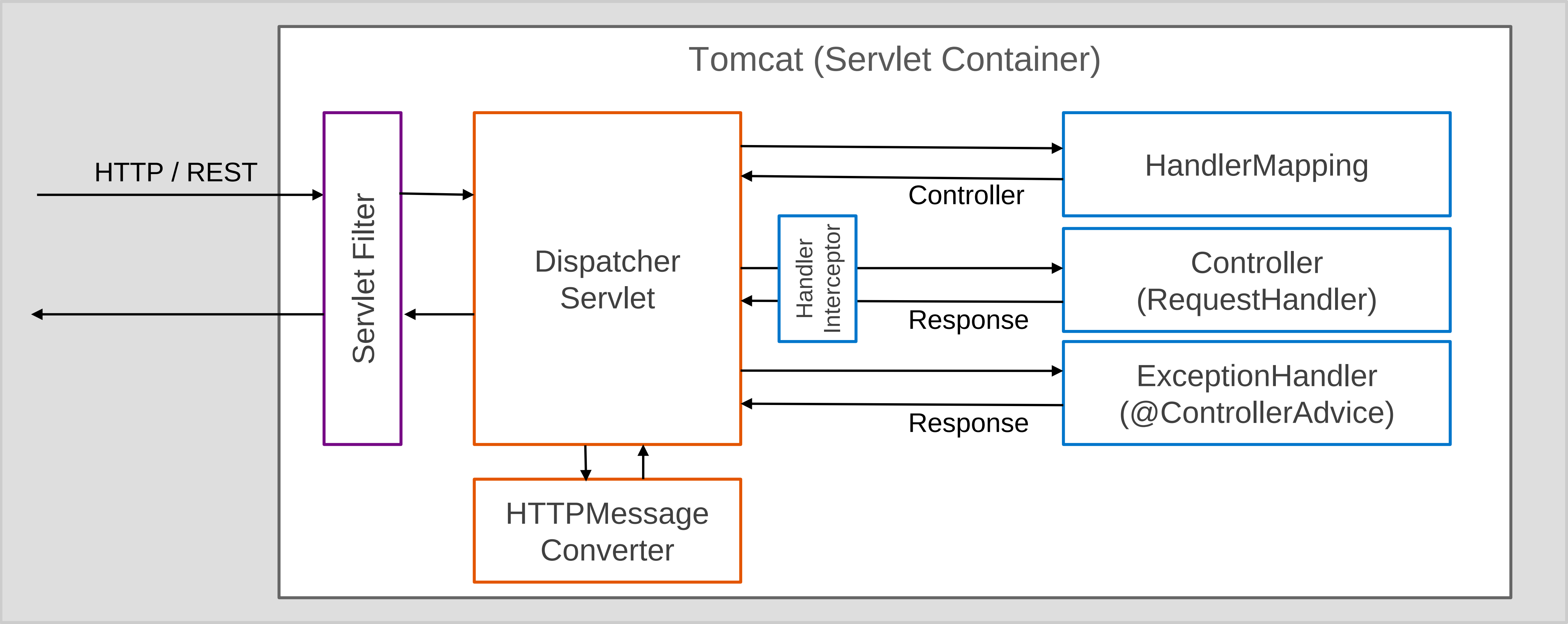
```
/
|-- WEB-INF
    |-- classes
        |-- AppInitializer.class
        |-- config
            |-- WebAppContextConfig.class
        |-- controllers
            |-- DefaultController.class
```

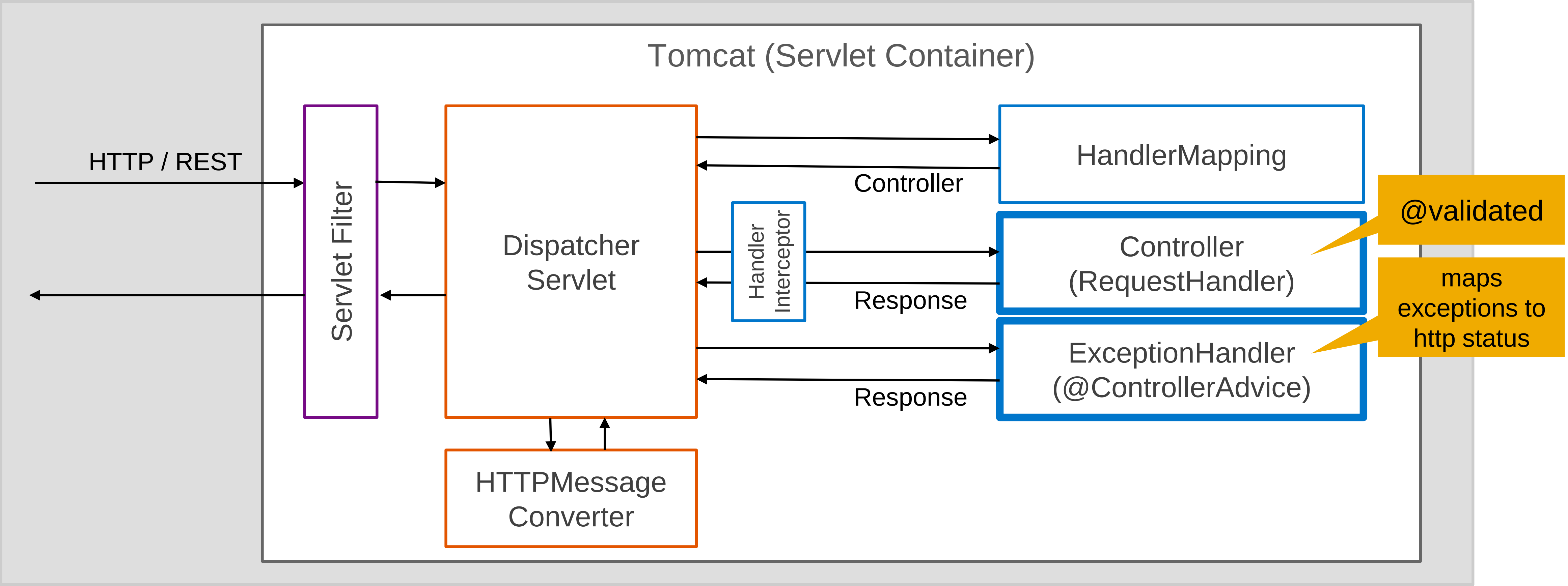
2. Detects `WebAplicationInitializer` on classpath

3. Instantiates `ServletContext` with `DispatcherServlet`

4a. Enables automatic setup of Spring `ApplicationContext`

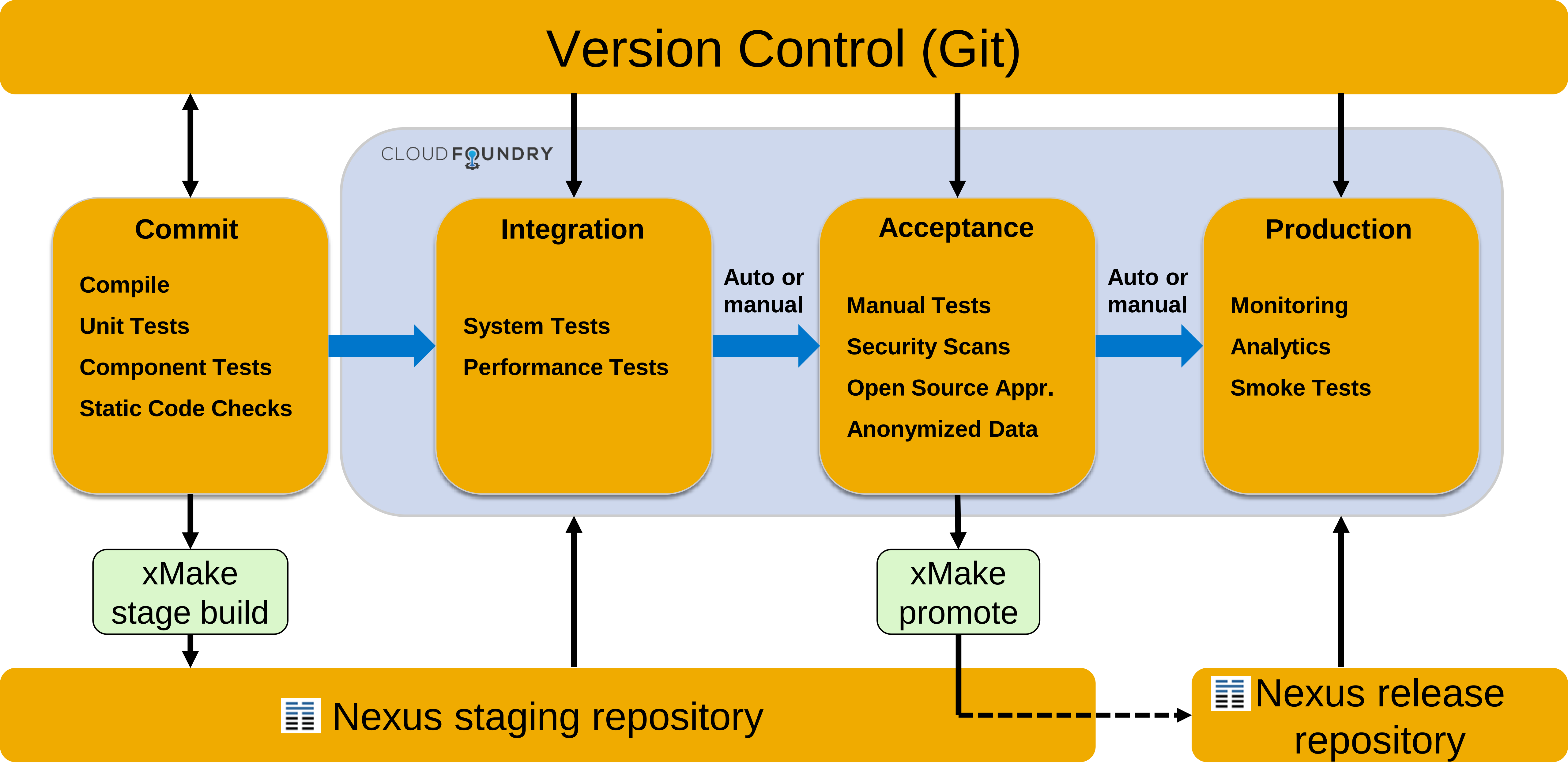
4b. enables registration of Spring Web MVC specific components


Tomcat (Servlet Container)
HTTP / REST
Servlet Filter
Dispatcher Servlet
HandlerMapping
Controller
Handler Interceptor
Controller (RequestHandler)
Response
ExceptionHandler (@ControllerAdvice)
Response
HTTPMessage Converter



@validated

maps exceptions to http status



Version Control (Git)

CLOUD FOUNDRY

Commit

- Compile
- Unit Tests
- Component Tests
- Static Code Checks

Integration

- System Tests
- Performance Tests

Auto or manual

Acceptance

- Manual Tests
- Security Scans
- Open Source Appr.
- Anonymized Data

Auto or manual

Production

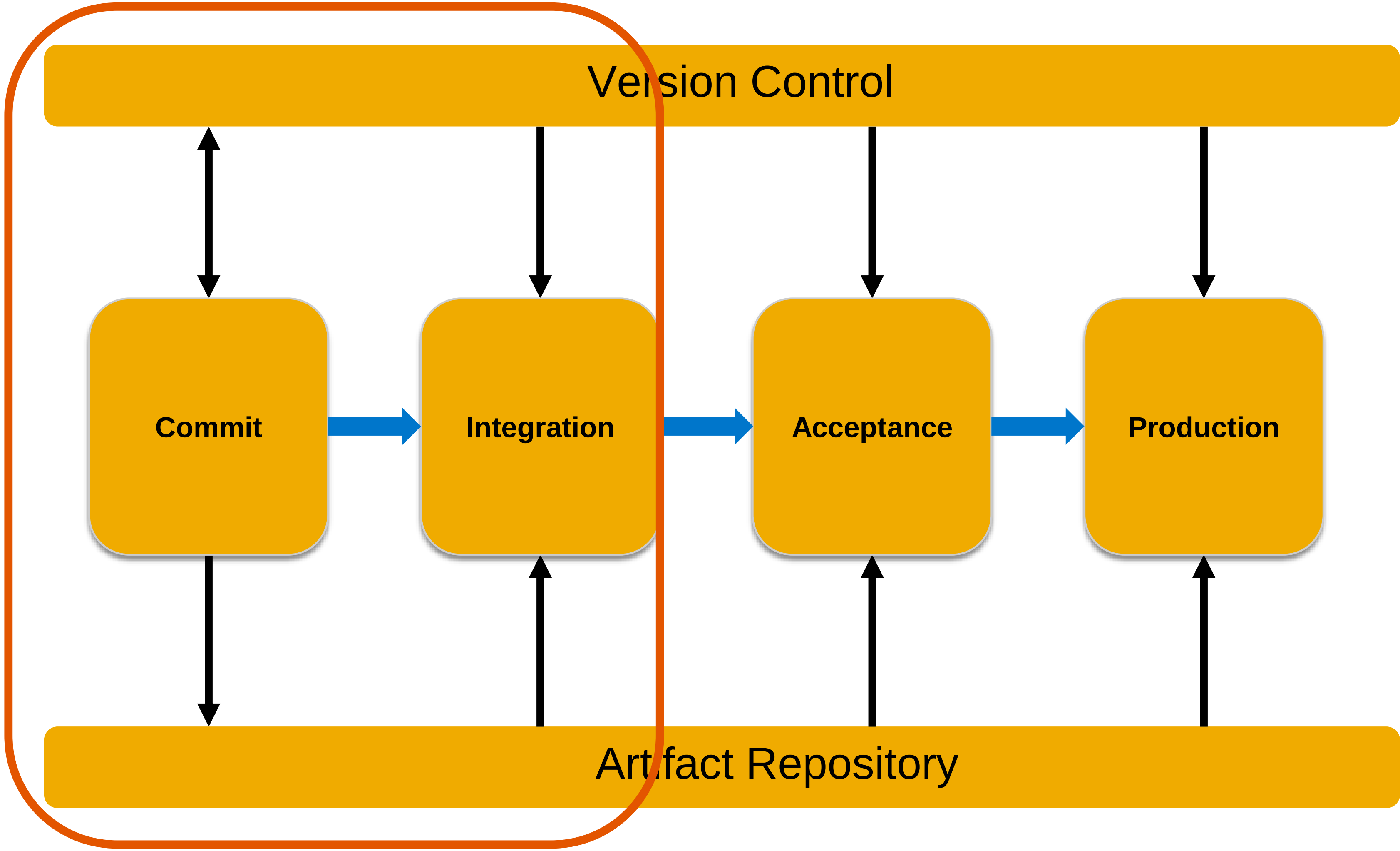
- Monitoring
- Analytics
- Smoke Tests

xMake stage build

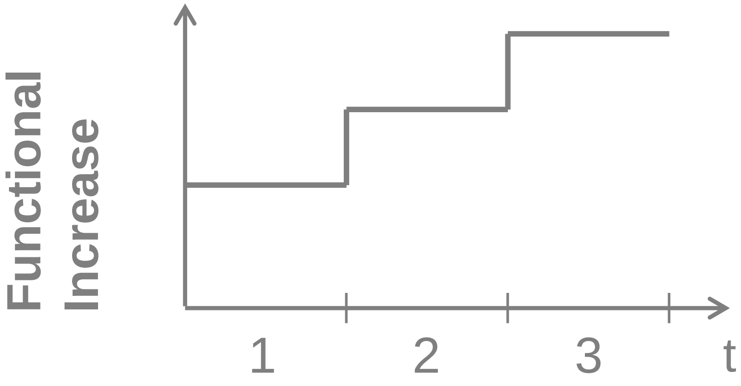
xMake promote

Nexus staging repository

Nexus release repository

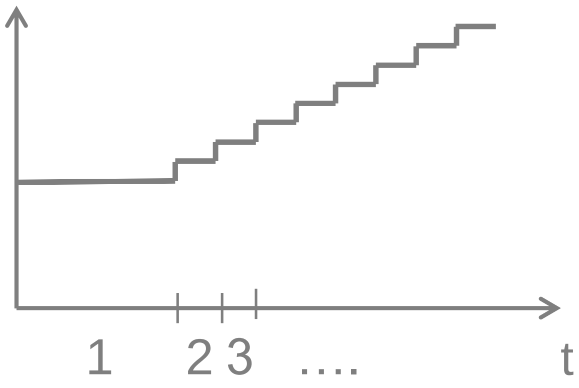

Version Control
Commit
Integration
Acceptance
Production
Artifact Repository

On Premise Applications



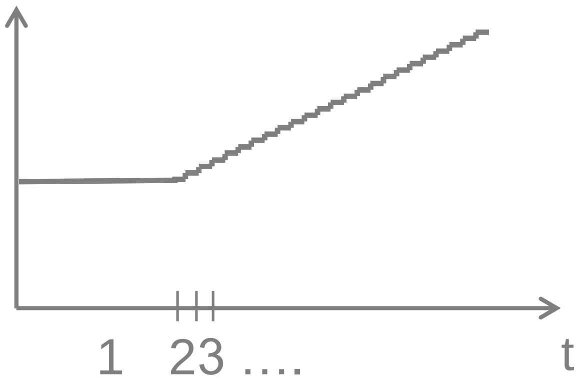
Major (Yearly) Releases

On Premise / Cloud Applications today

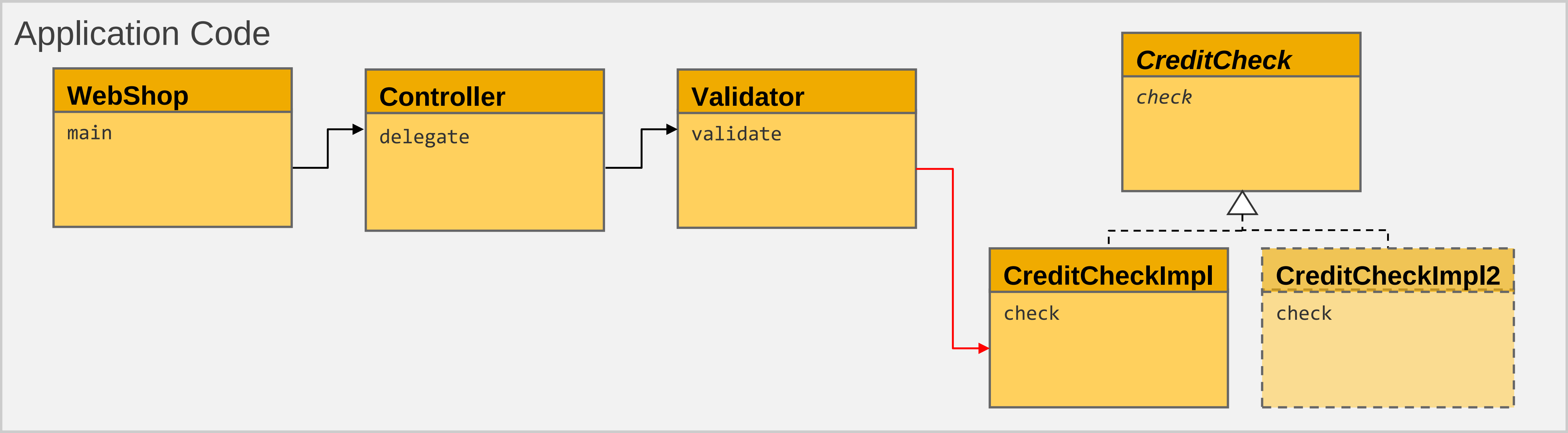


Quarterly Shipments

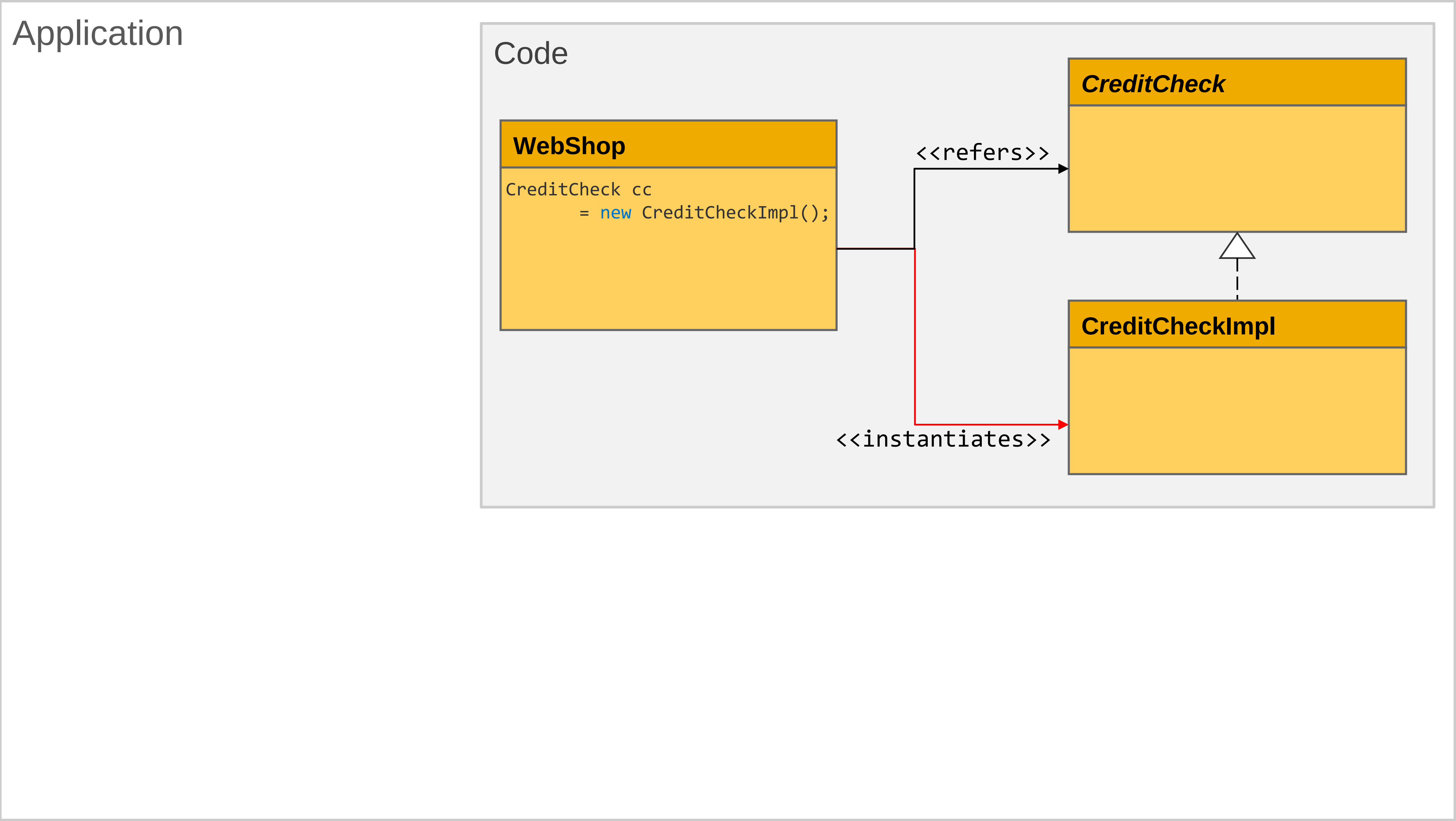
Cloud Applications in the future



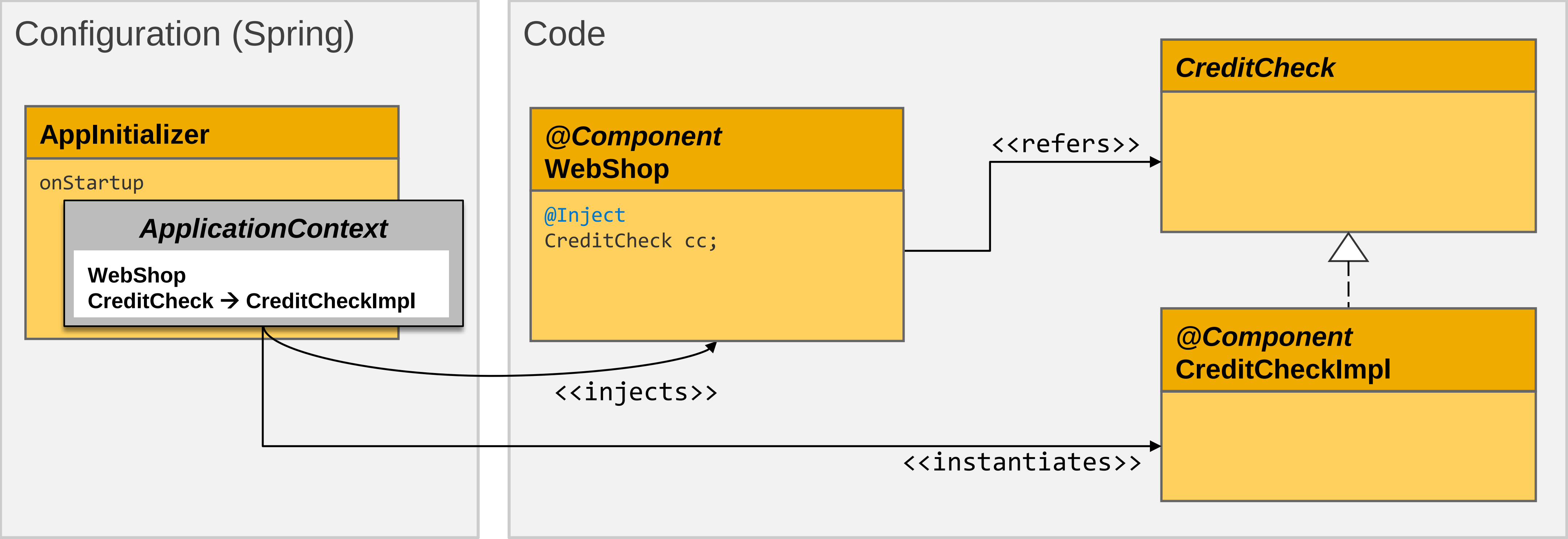
Quasi Continuous Delivery



Application Code
WebShop
main
Controller
delegate
Validator
validate
CreditCheck
check
CreditCheckImpl
check
CreditCheckImpl2
check



```
CreditCheck cc
        = new CreditCheckImpl();
```



Configuration (Spring)

AppInitializer

onStartup

ApplicationContext

WebShop
CreditCheck → CreditCheckImpl

Code

@Component
WebShop

```
@Inject
CreditCheck cc;
```

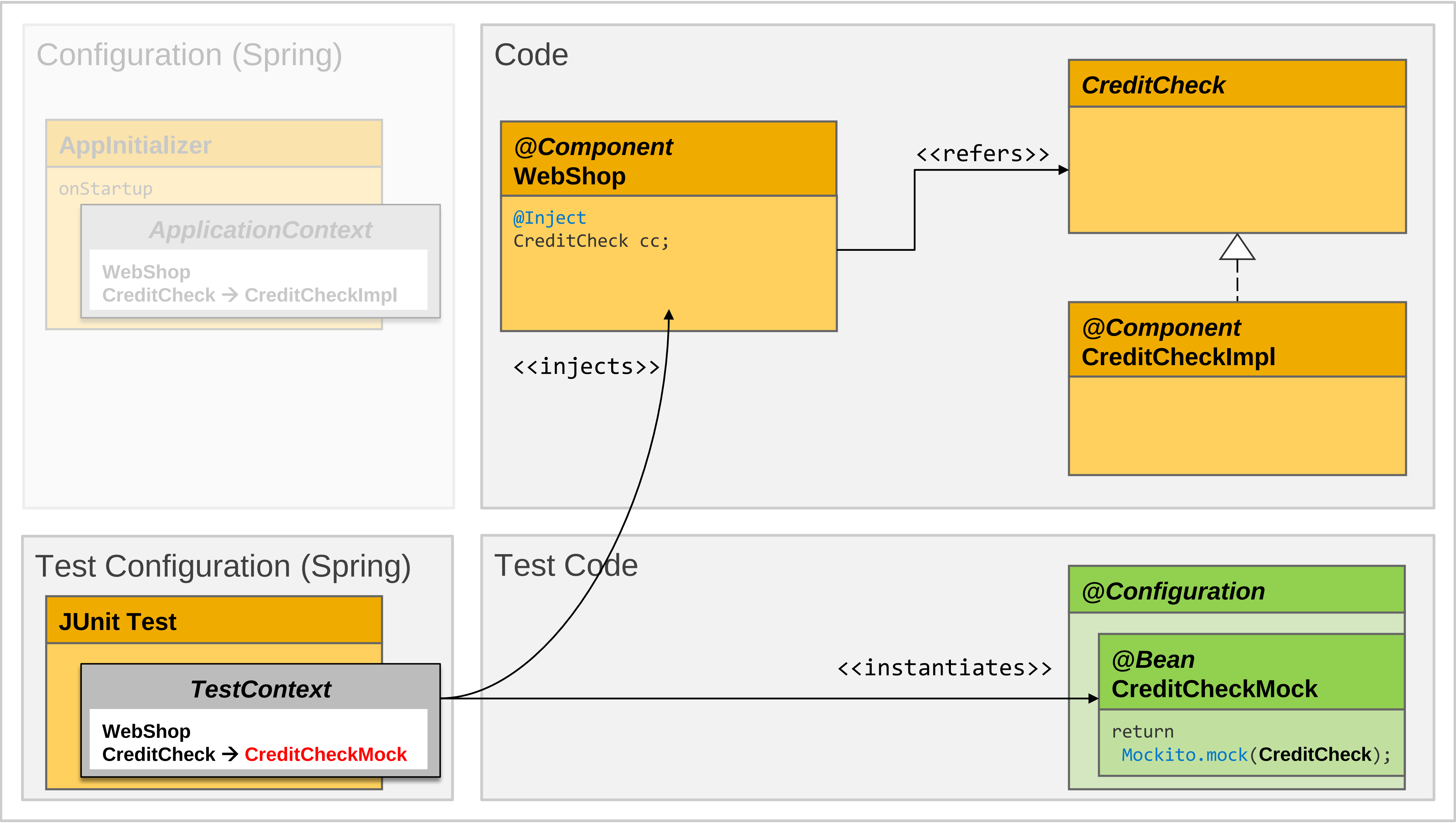
CreditCheck

@Component
CreditCheckImpl

<<refers>>

<<injects>>

<<instantiates>>



Configuration (Spring)

AppInitializer

onStartup

ApplicationContext

WebShop
CreditCheck → CreditCheckImpl

Code

@Component
WebShop

```
@Inject
CreditCheck cc;
```

<<refers>>

CreditCheck

@Component
CreditCheckImpl

<<injects>>

Test Configuration (Spring)

JUnit Test

TestContext

WebShop
CreditCheck → CreditCheckMock

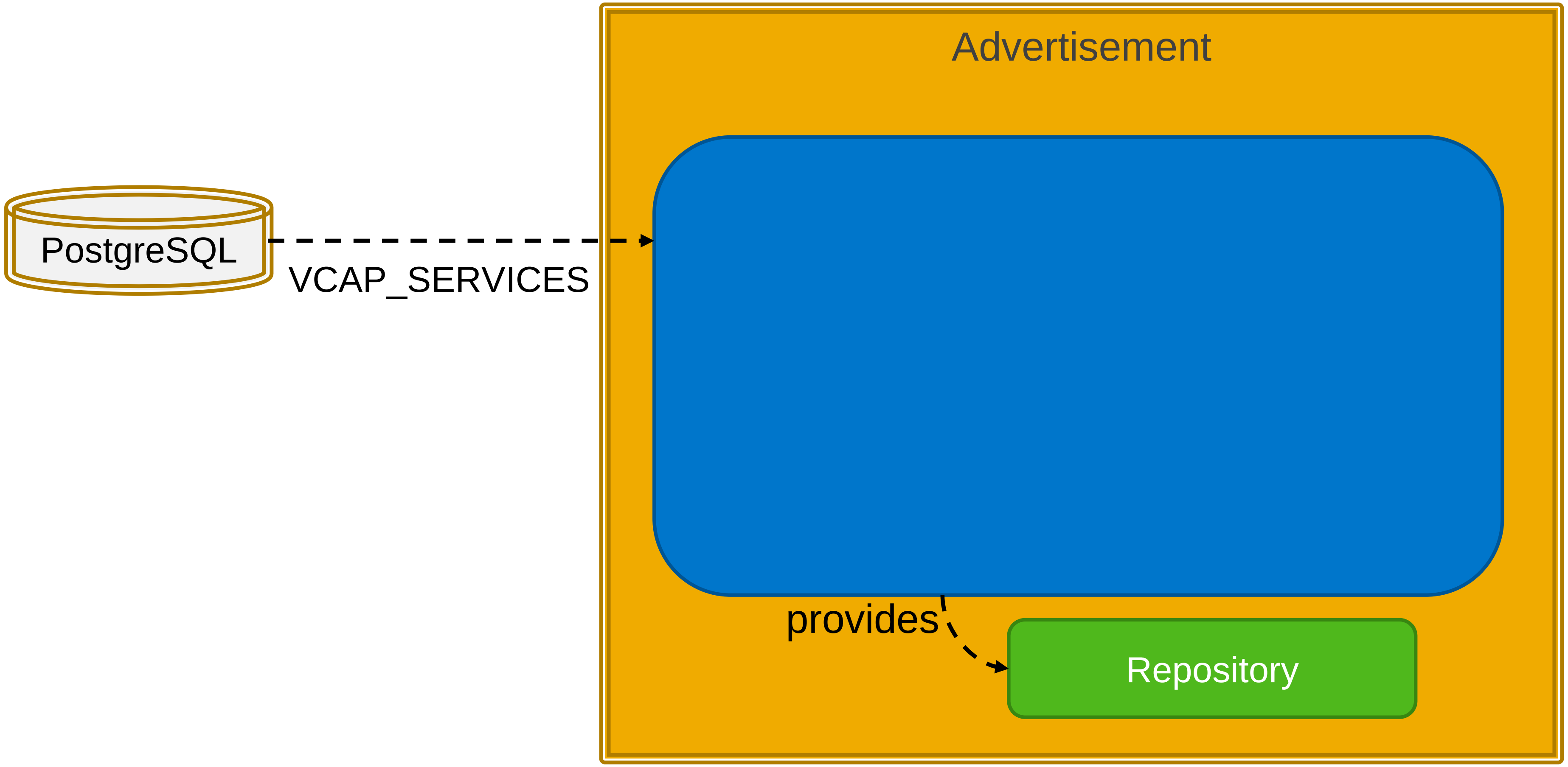
Test Code

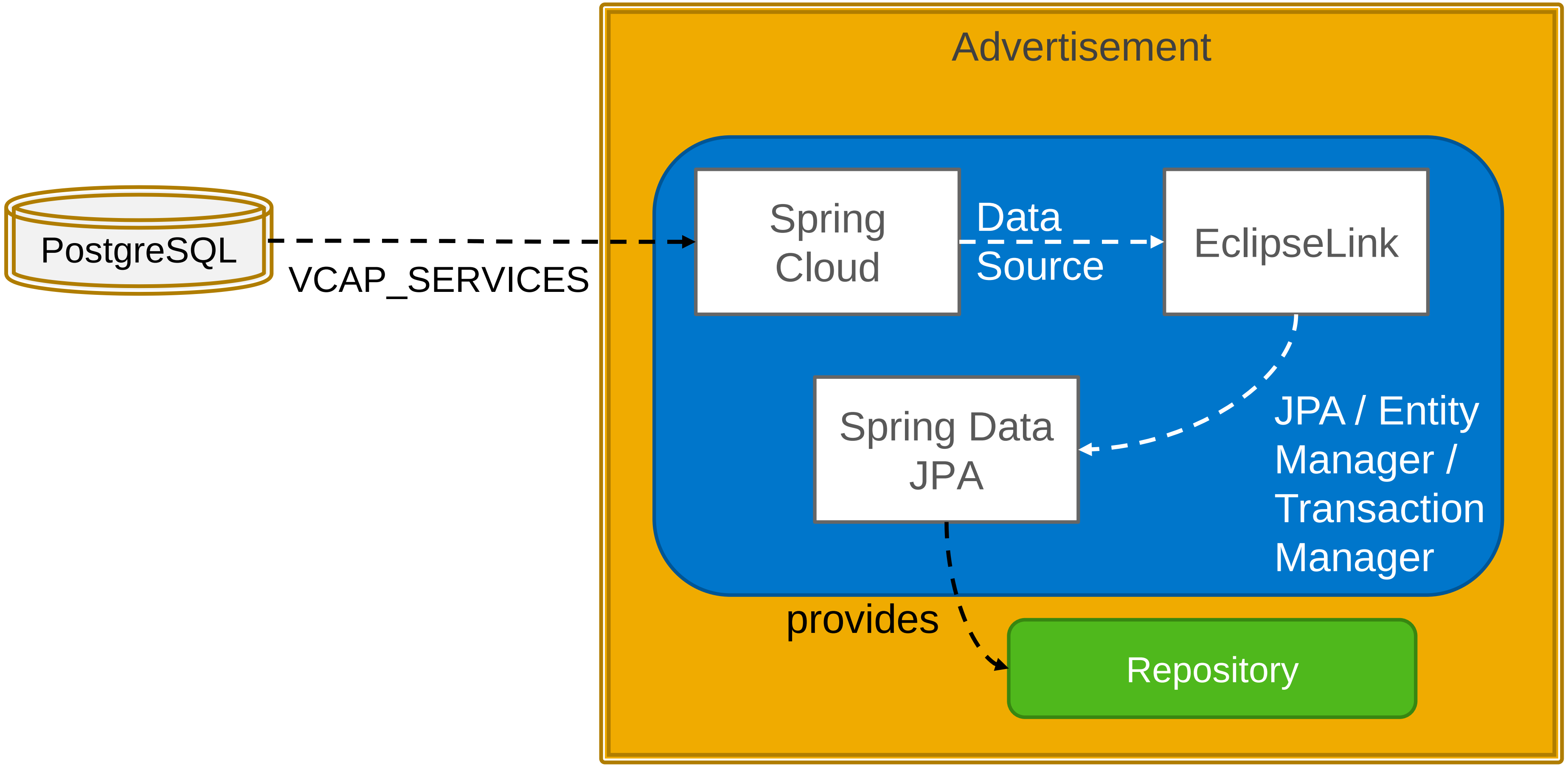
<<instantiates>>

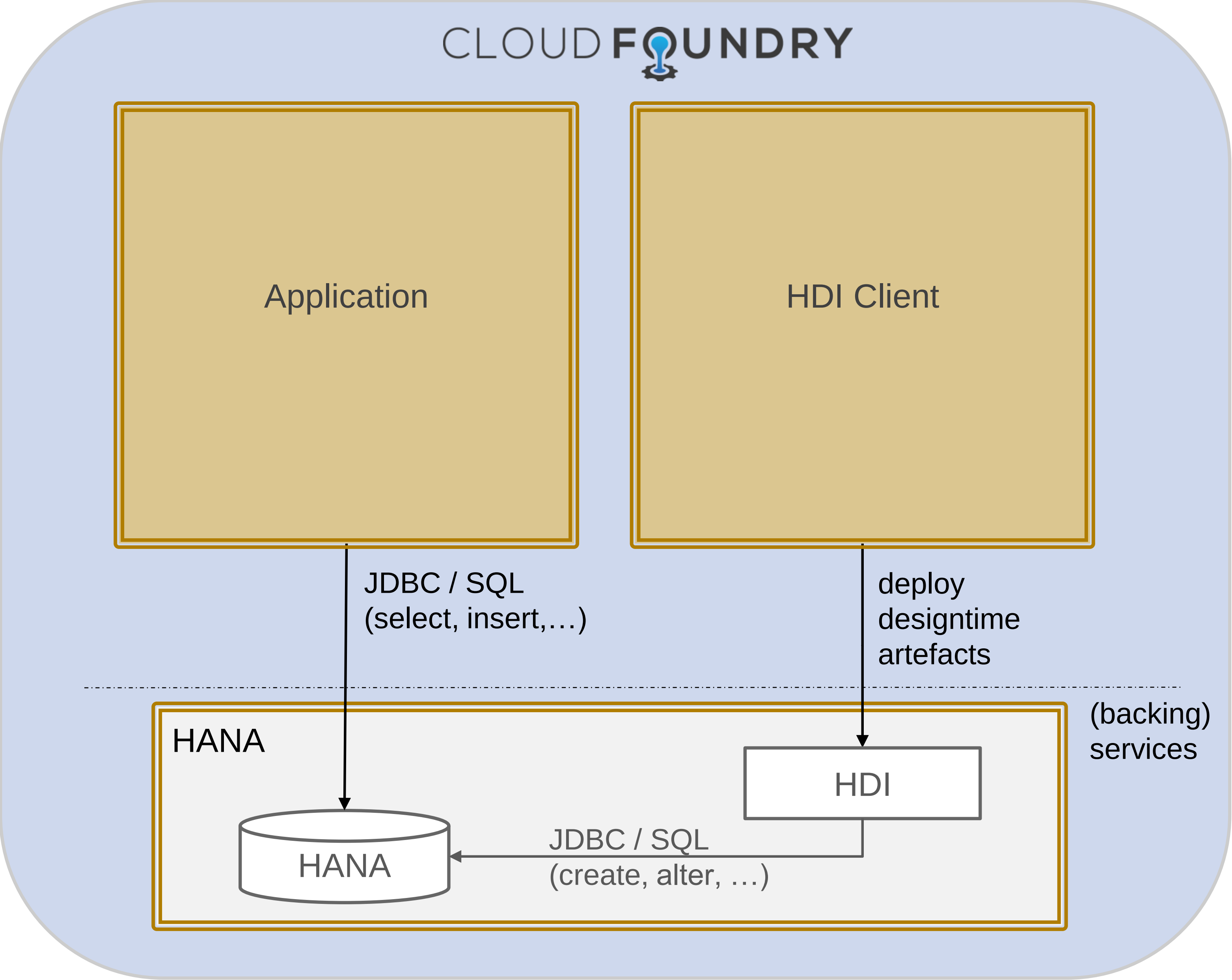
@Configuration

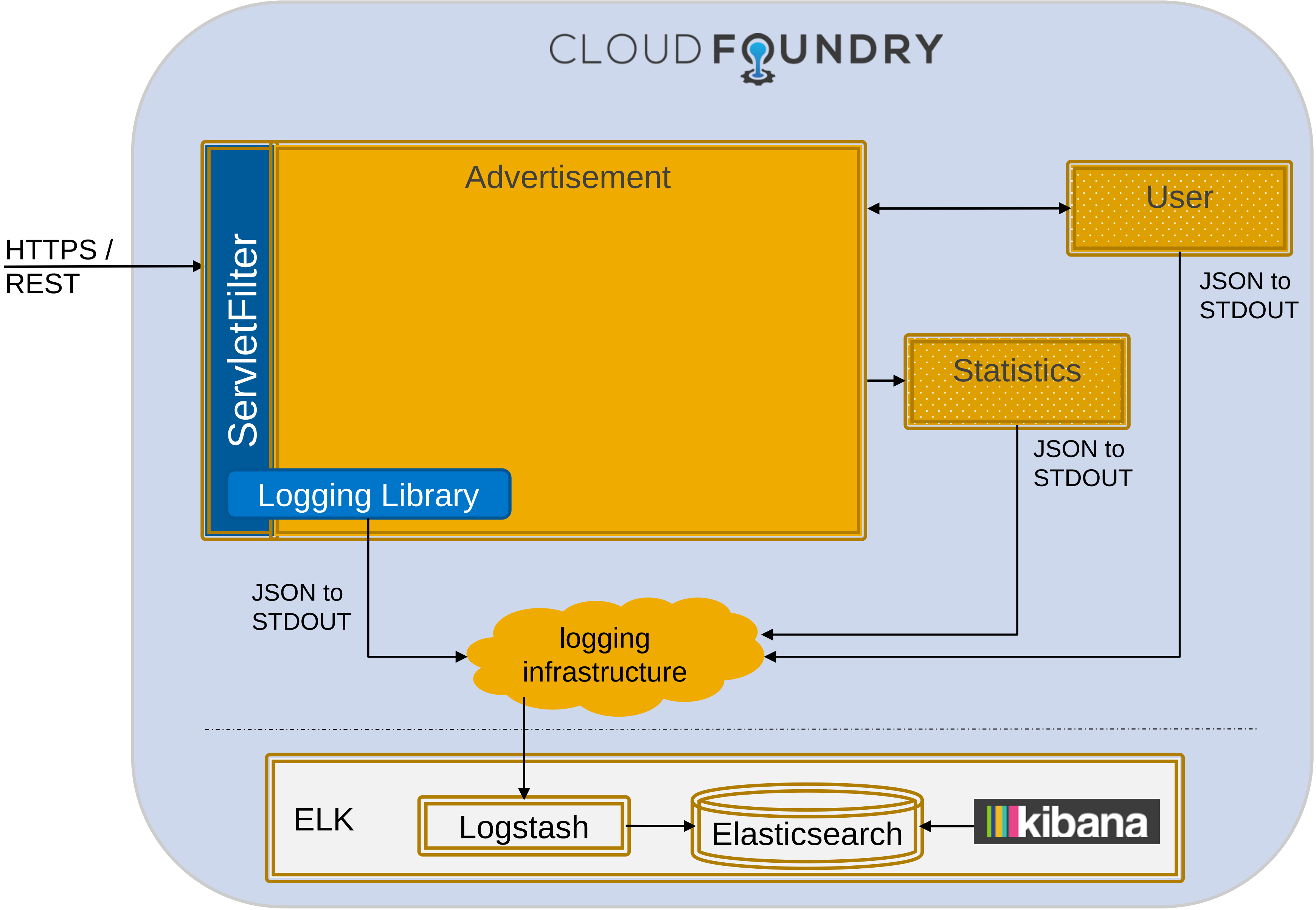
@Bean
CreditCheckMock

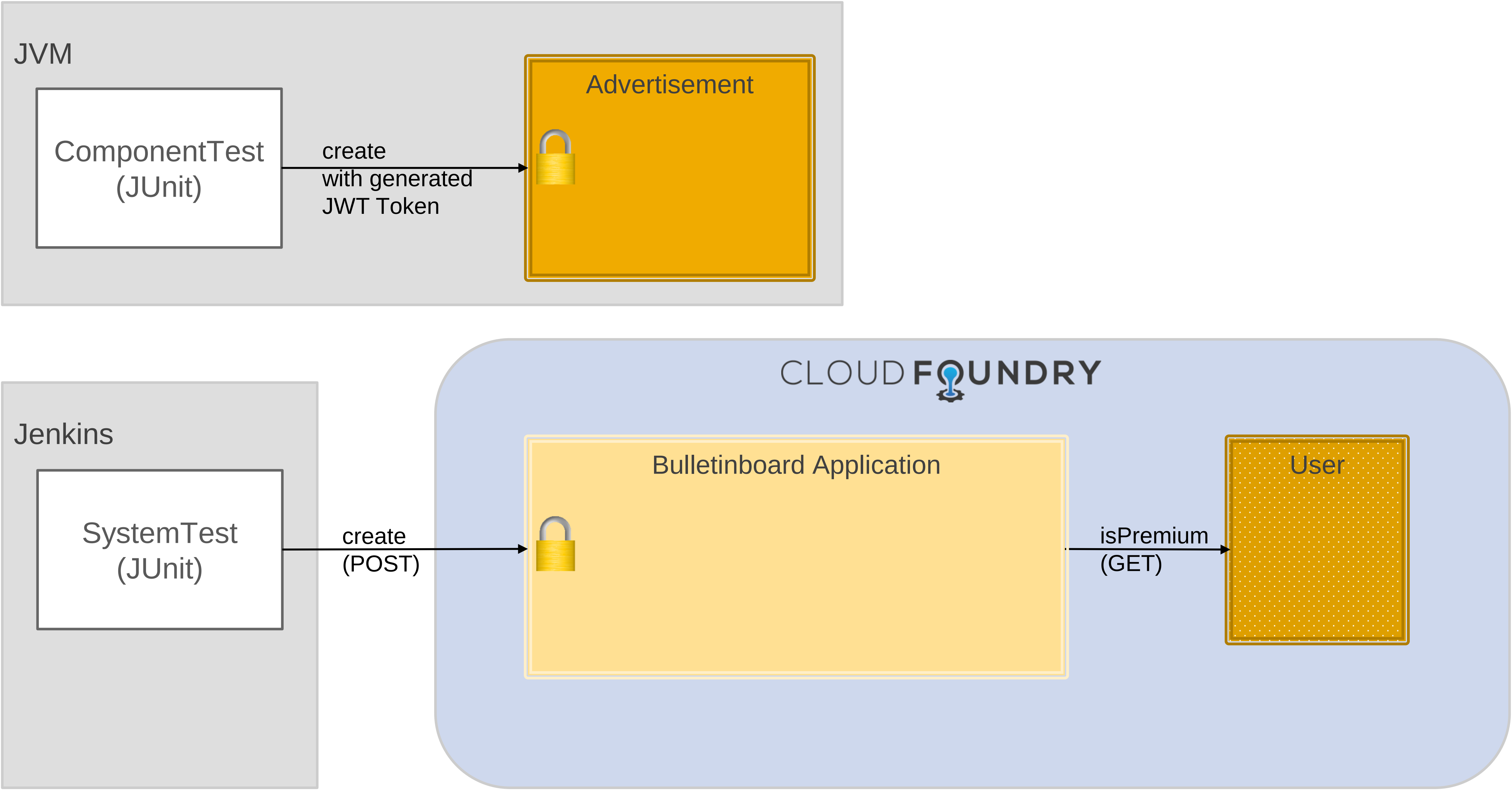
```
return
 Mockito.mock(CreditCheck);
```

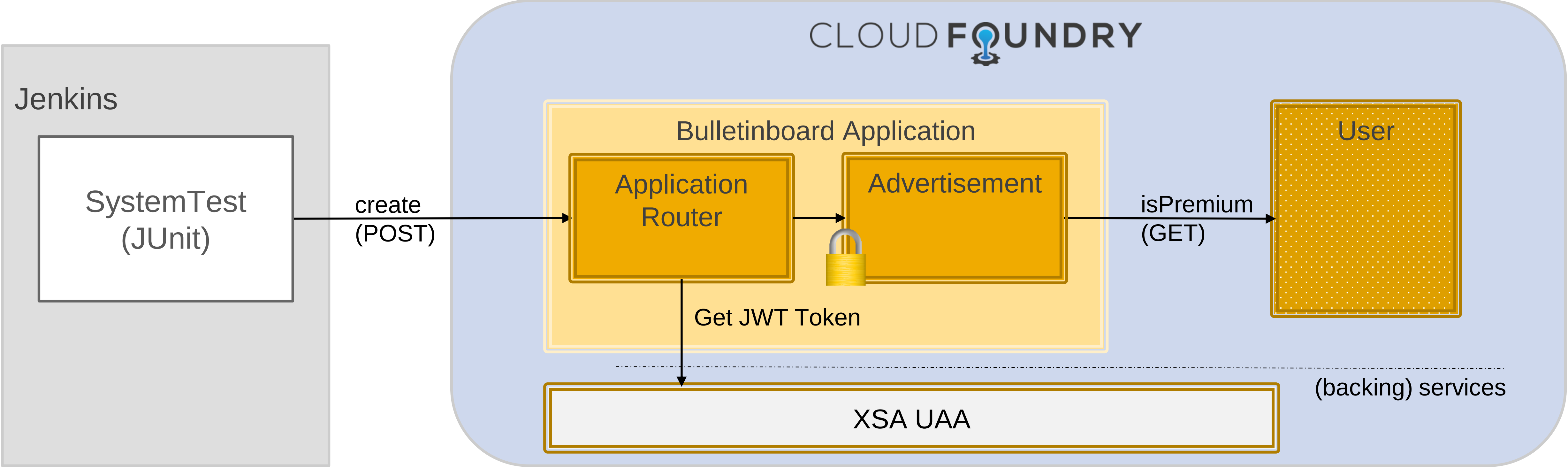

Advertisement
PostgreSQL
VCAP_SERVICES
provides
Repository

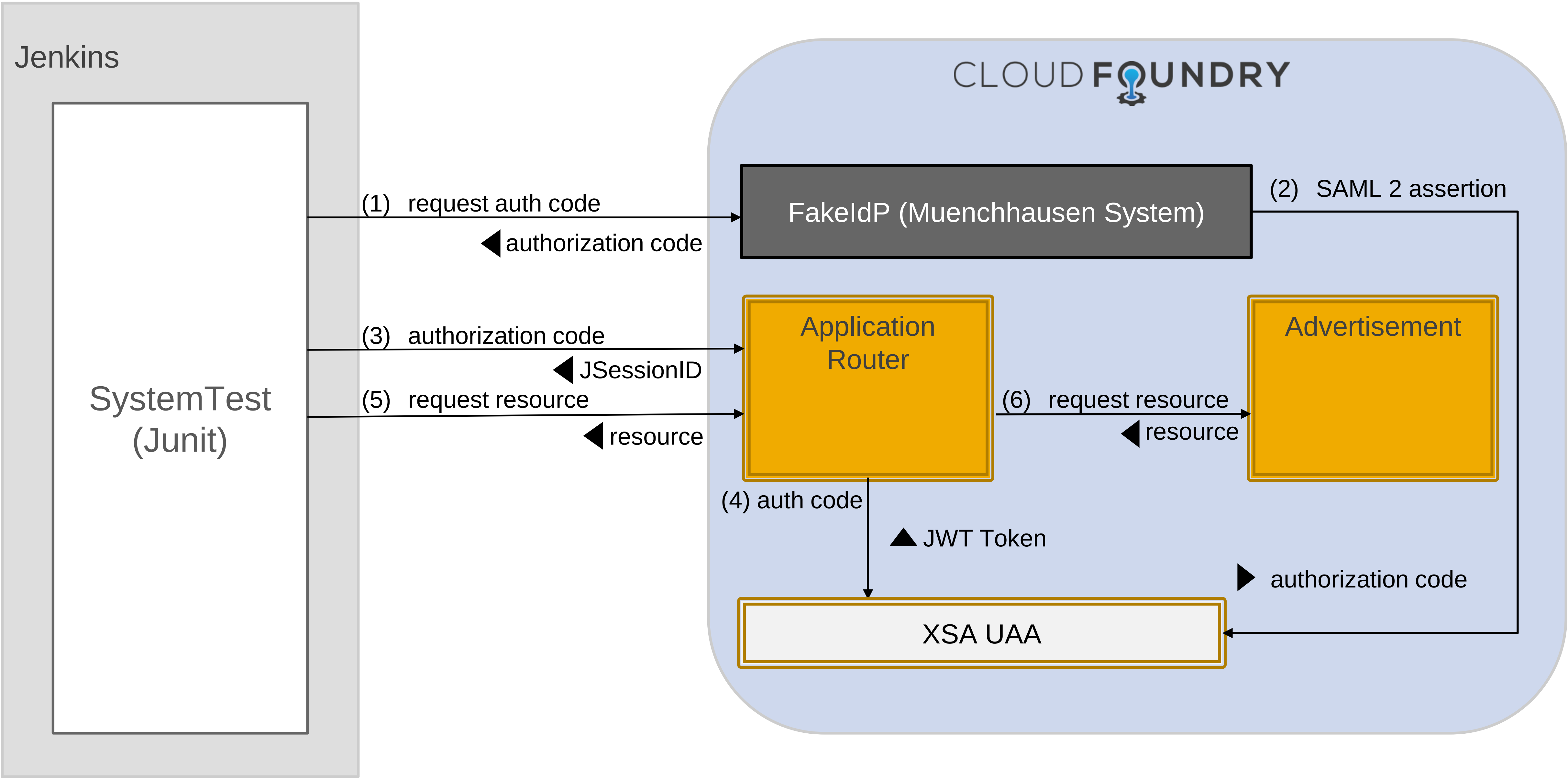

Advertisement
PostgreSQL
VCAP_SERVICES
Spring Cloud
Data Source
EclipseLink
Spring Data JPA
JPA / Entity Manager / Transaction Manager
provides
Repository

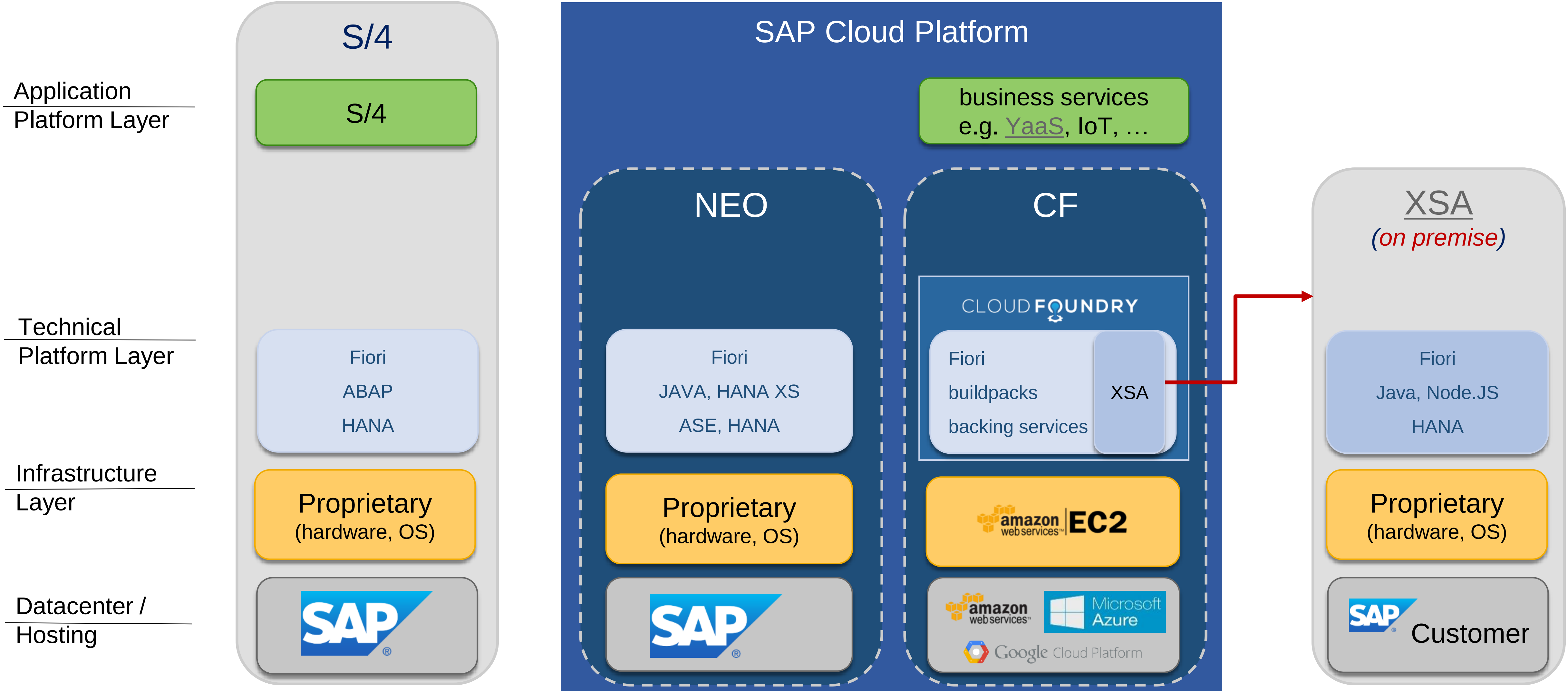

CLOUD FOUNDRY
Application
HDI Client
JDBC / SQL
(select, insert,…)
deploy
designtime
artefacts
(backing)
services
HANA
HDI
JDBC / SQL
(create, alter, …)
HANA


CLOUD FOUNDRY
HTTPS / REST
ServletFilter
Advertisement
Logging Library
User
Statistics
JSON to STDOUT
JSON to STDOUT
JSON to STDOUT
logging infrastructure
ELK
Logstash
Elasticsearch
kibana


JVM
ComponentTest (JUnit)
create
with generated
JWT Token
Advertisement
CLOUD FOUNDRY
Jenkins
SystemTest (JUnit)
create
(POST)
Bulletinboard Application
isPremium
(GET)
User


Jenkins
SystemTest (JUnit)
create (POST)
CLOUD FOUNDRY
Bulletinboard Application
Application Router
Advertisement
isPremium (GET)
User
Get JWT Token
(backing) services
XSA UAA


Jenkins
SystemTest
(Junit)
CLOUD FOUNDRY
FakeIdP (Muenchhausen System)
(1) request auth code
authorization code
(2) SAML 2 assertion
(3) authorization code
JSessionID
(5) request resource
resource
Application
Router
Advertisement
(6) request resource
resource
(4) auth code
JWT Token
authorization code
XSA UAA



Application Platform Layer

Technical Platform Layer

Infrastructure Layer

Datacenter / Hosting

S/4

S/4

Fiori

ABAP

HANA

Proprietary
(hardware, OS)

SAP

SAP Cloud Platform

business services
e.g. YaaS, IoT, …

NEO

Fiori

JAVA, HANA XS

ASE, HANA

Proprietary
(hardware, OS)

SAP

CF

CLOUD FOUNDRY

Fiori

buildpacks

backing services

XSA

amazon web services EC2

amazon web services

Microsoft Azure

Google Cloud Platform

XSA
(on premise)

Fiori

Java, Node.JS

HANA

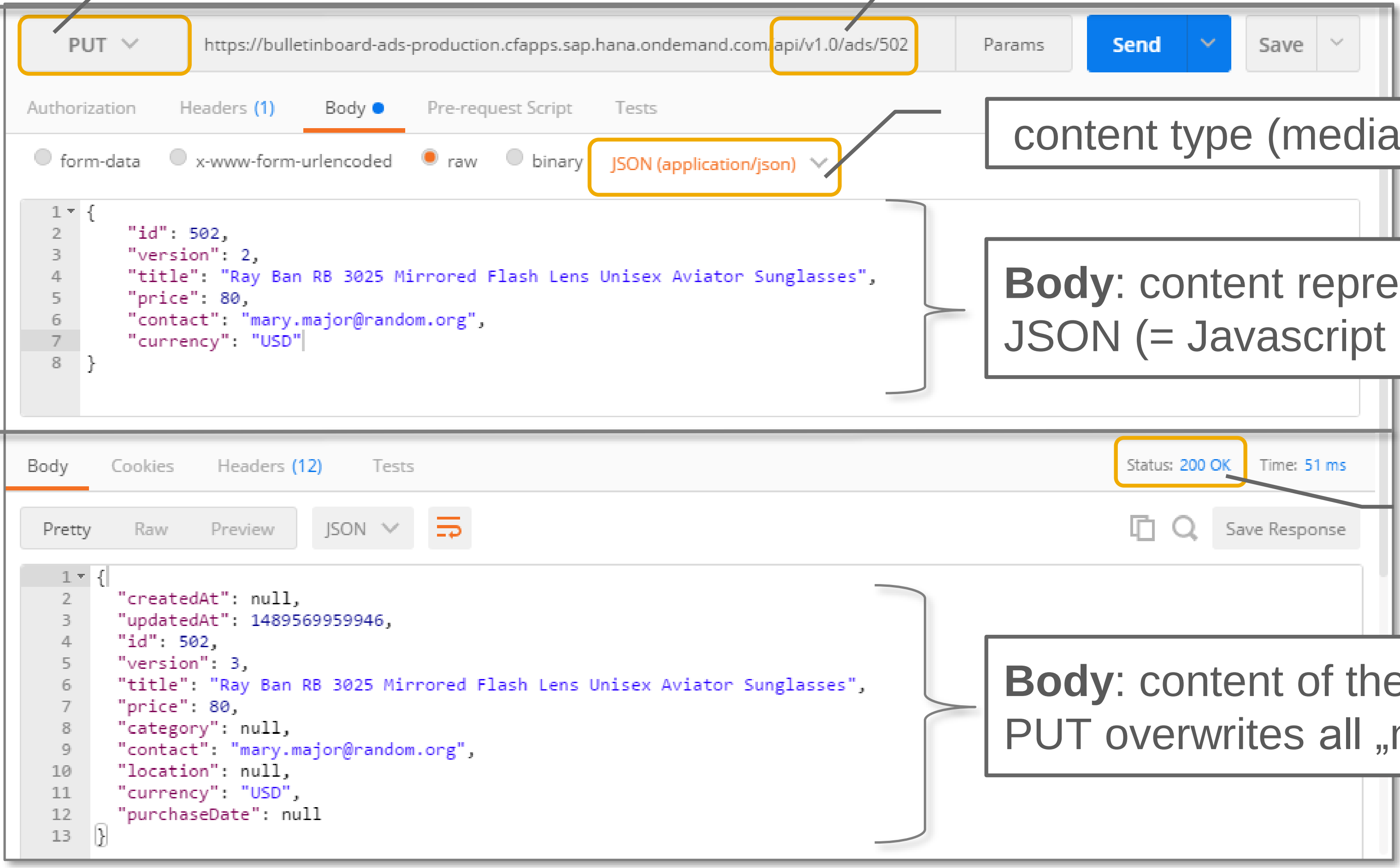
Proprietary
(hardware, OS)

SAP Customer

http method

resource id

Request



PUT https://bulletinboard-ads-production.cfapps.sap.hana.ondemand.com/api/v1.0/ads/502

JSON (application/json)

```
{
    "id": 502,
    "version": 2,
    "title": "Ray Ban RB 3025 Mirrored Flash Lens Unisex Aviator Sunglasses",
    "price": 80,
    "contact": "mary.major@random.org",
    "currency": "USD"
}
```

Response

Status: 200 OK Time: 51 ms

```
{
  "createdAt": null,
  "updatedAt": 1489569959946,
  "id": 502,
  "version": 3,
  "title": "Ray Ban RB 3025 Mirrored Flash Lens Unisex Aviator Sunglasses",
  "price": 80,
  "category": null,
  "contact": "mary.major@random.org",
  "location": null,
  "currency": "USD",
  "purchaseDate": null
}
```

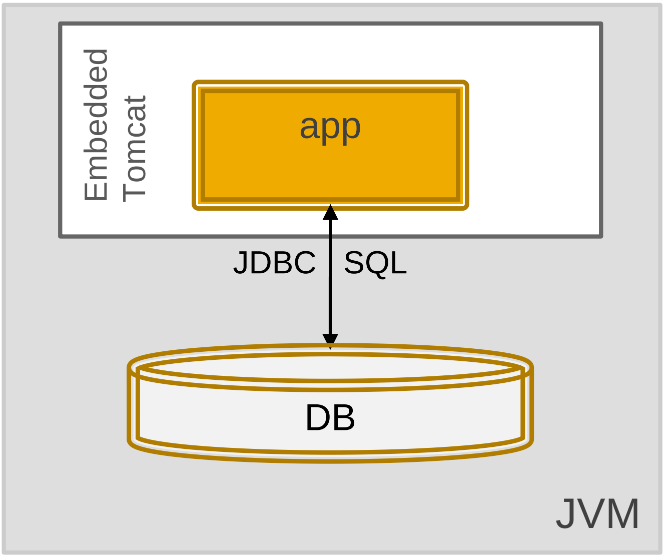
content type (media type)

Body: content representation
JSON (= Javascript Object Notation)

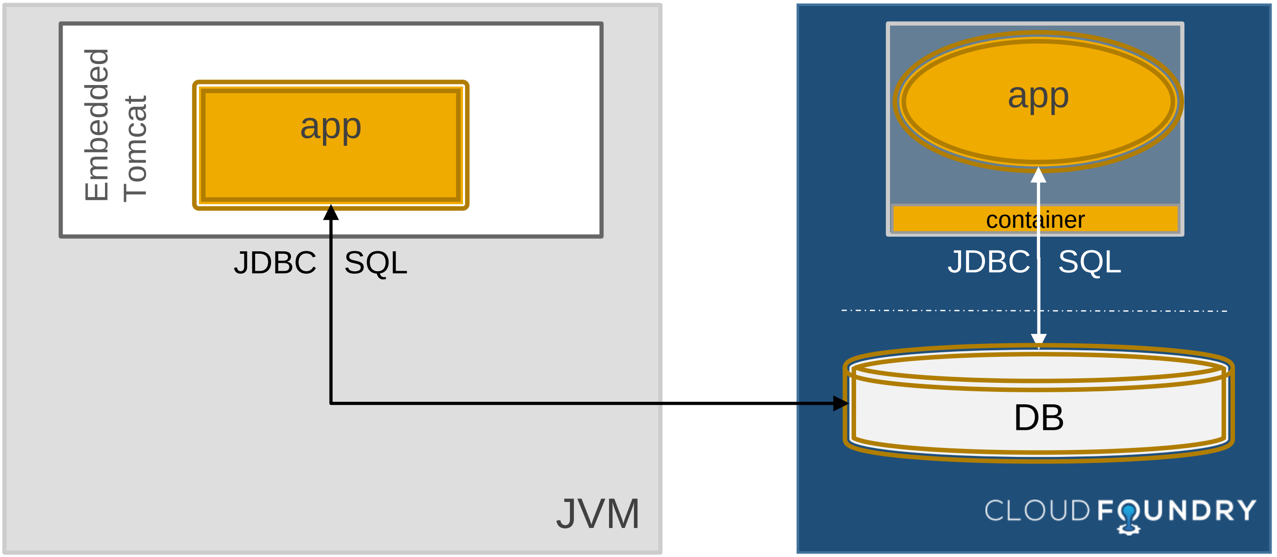
http status code

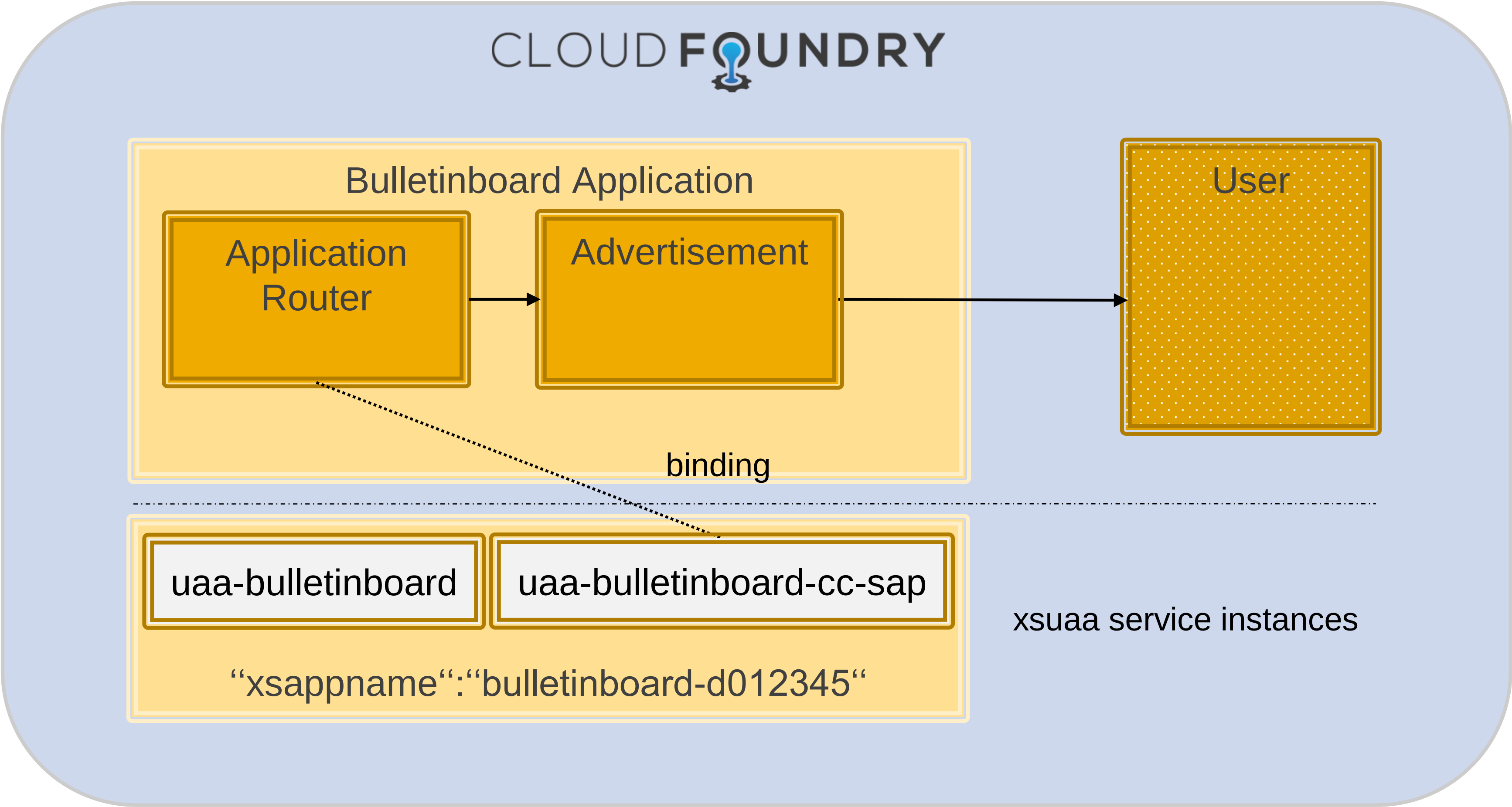
Body: content of the updated resource
PUT overwrites all „modifiable“ fields

1.


Embedded Tomcat
app
JDBC
SQL
DB
JVM

2.


Embedded Tomcat
app
JDBC
SQL
JVM
app
container
JDBC
SQL
DB
CLOUD FOUNDRY



CLOUD FOUNDRY

Bulletinboard Application

Application Router

Advertisement

User

binding

uaa-bulletinboard

uaa-bulletinboard-cc-sap

“xsappname“:“bulletinboard-d012345“

xsuaa service instances