



BUILD AND DEPLOY A CLOUD NATIVE MICROSERVICE TO THE ORACLE CLOUD

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About Me

- Currently
 - Developer Advocate @ Oracle
- Previously
 - AT&T
 - Booz, Allen & Hamilton
- 16 Years Full-Stack
 - Java, Groovy, Grails, ColdFusion
 - JavaScript, Angular, Node

Agenda

- Create a simple Micronaut app
- Set up CI/CD via GitHub Actions
- Distributed configuration via Oracle Cloud Vault
- Configure application
- Add CRUD support
- More...



```
1 assertEquals(OCI, OCI);
2 String oci ="Oracle Cloud Infrastructure";
```

What is “natively cloud native”?

- Minimum start-up times
 - Sub 500ms on JDK 14
- Low memory consumption
 - 290MB on JDK 14
- Environment aware
 - Cloud instance metadata
- Distributed configuration
- Service discovery
 - Consul
 - Eureka
- Distributed tracing
 - Zipkin
 - Jaeger
- Serverless functions

<https://objectcomputing.com/news/2020/04/07/micronaut-vs-quarkus-vs-spring-boot-performance-jdk-14>

<https://docs.micronaut.io/latest/guide/index.html#cloud>



Let's Build One!



Step 1:

Create The App



Step 2:

Setup CI/CD



Step 3:

Distributed Config in OCI

Create Vault, Key & Secrets

Step 4:

Distributed Config Demo

Step 5:

Configure Application & Add CRUD Support

Testing The App



Add Testing Steps

```
1 - name: 'Run Tests'  
2   run: |  
3     ./gradlew test  
4  
5 - name: 'Publish Test Report'  
6   if: always()  
7   uses: actions/upload-artifact@v2-preview  
8   with:  
9     name: 'test-report'  
10    path: build/reports/tests/test/*
```

Use Test Containers

```
1 class AbstractSpec extends Specification {
2     @Shared
3     @AutoCleanup
4     static OracleContainer oracleContainer =
5         new OracleContainer("phx.ocir.io/toddrsharp/oracle-db/oracle/database:18.4.0-xe")
6             .withEnv("ORACLE_PWD", "Str0ngPassw0rd")
7             .withStartupTimeoutSeconds(900)
8             .withConnectTimeoutSeconds(900)
9             .withPassword("Str0ngPassw0rd")
10    @Shared
11    @AutoCleanup
12    static ApplicationContext context
13    static {
14        System.setProperty("oracle.jdbc.fanEnabled", "false")
15        oracleContainer.start()
16        context = ApplicationContext.run(
17            [
18                "datasources.default.url": oracleContainer.getJdbcUrl(),
19                "datasources.default.username": oracleContainer.getUsername(),
20                "datasources.default.password": oracleContainer.getPassword(),
21                "datasources.default.schema-generate": SchemaGenerate.NONE,
22                "datasources.default.dialect": Dialect.ORACLE
23            ],
24            Environment.TEST
25        )
26    }
27 }
```



Schema Migrations With Liquibase

Add Dependencies

```
1 compile "io.micronaut.configuration:micronaut-liquibase:1.3.0"
2 /* override and get the latest liquibase */
3 compile 'org.liquibase:liquibase-core:3.8.8'
4 compile 'com.fasterxml.jackson.module:jackson-module-jaxb-annotations'
```

Configure Liquibase

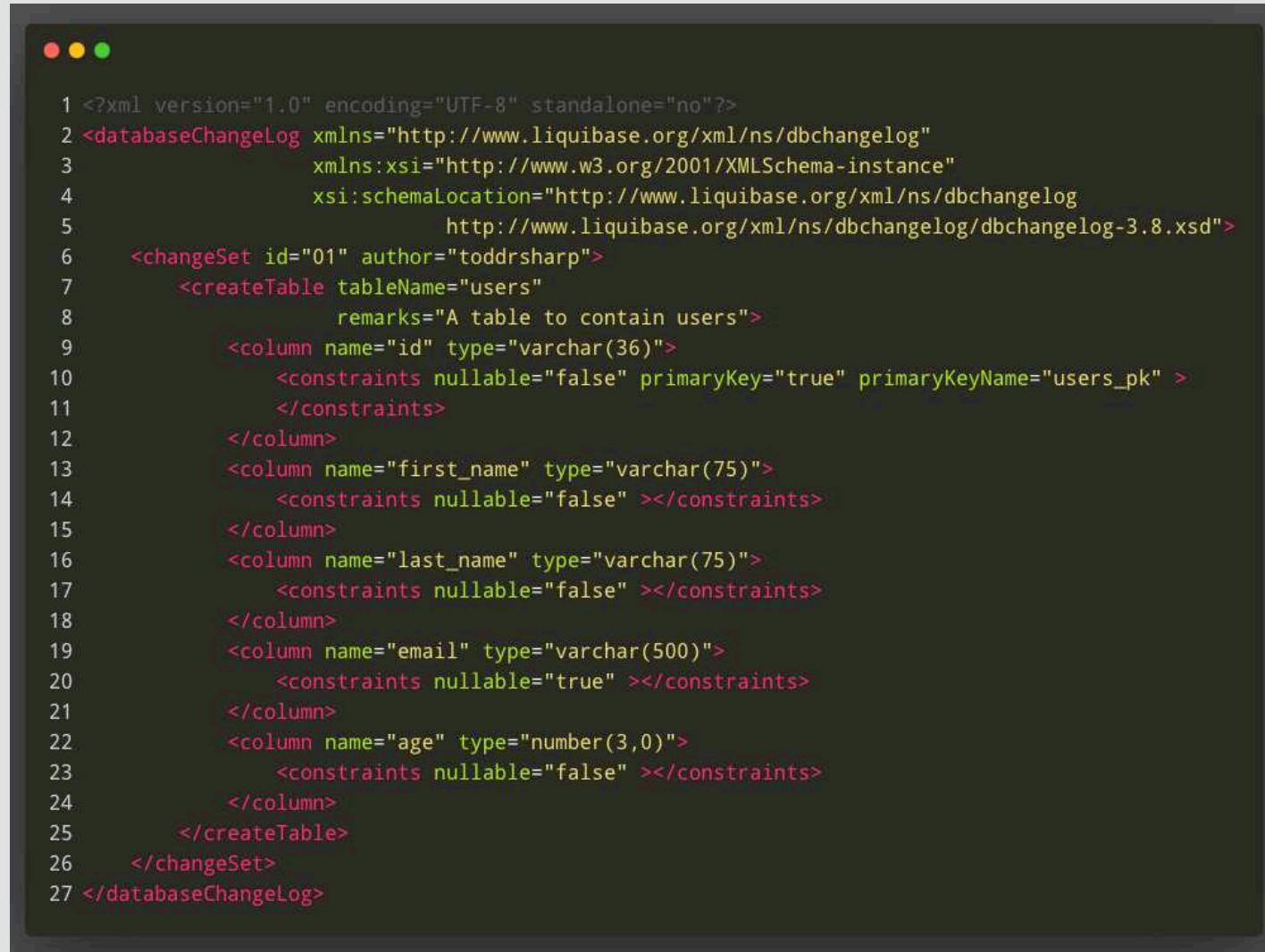


```
1 liquibase:  
2   datasources:  
3     default:  
4       change-log: 'classpath:db/liquibase-changelog.xml'
```

Liquibase Changelog

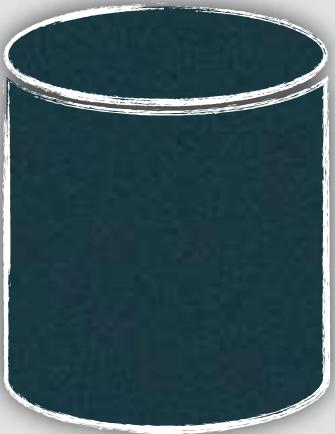
```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <databaseChangeLog
3     xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
4     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
5     xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
6         http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.8.xsd">
7     <include file="changelog/01-create-user-table.xml" relativeToChangelogFile="true" ></include>
8 </databaseChangeLog>
```

Liquibase Changeset

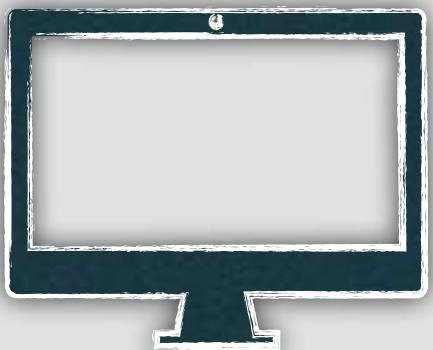


```
1 <?xml version="1.0" encoding="UTF-8" standalone="no"?>
2 <databaseChangeLog xmlns="http://www.liquibase.org/xml/ns/dbchangelog"
3           xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4           xsi:schemaLocation="http://www.liquibase.org/xml/ns/dbchangelog
5                           http://www.liquibase.org/xml/ns/dbchangelog/dbchangelog-3.8.xsd">
6   <changeSet id="01" author="toddrsharp">
7     <createTable tableName="users">
8       remarks="A table to contain users"
9       <column name="id" type="varchar(36)">
10      <constraints nullable="false" primaryKey="true" primaryKeyName="users_pk" >
11        </constraints>
12      </column>
13      <column name="first_name" type="varchar(75)">
14        <constraints nullable="false" ></constraints>
15      </column>
16      <column name="last_name" type="varchar(75)">
17        <constraints nullable="false" ></constraints>
18      </column>
19      <column name="email" type="varchar(500)">
20        <constraints nullable="true" ></constraints>
21      </column>
22      <column name="age" type="number(3,0)">
23        <constraints nullable="false" ></constraints>
24      </column>
25    </createTable>
26  </changeSet>
27 </databaseChangeLog>
```

Always Free Tier



ATP or ADW. 2 databases total, each with 1 OCPU and 20 GB storage.



2 virtual machines with 1/8 OCPU and 1 GB memory each.



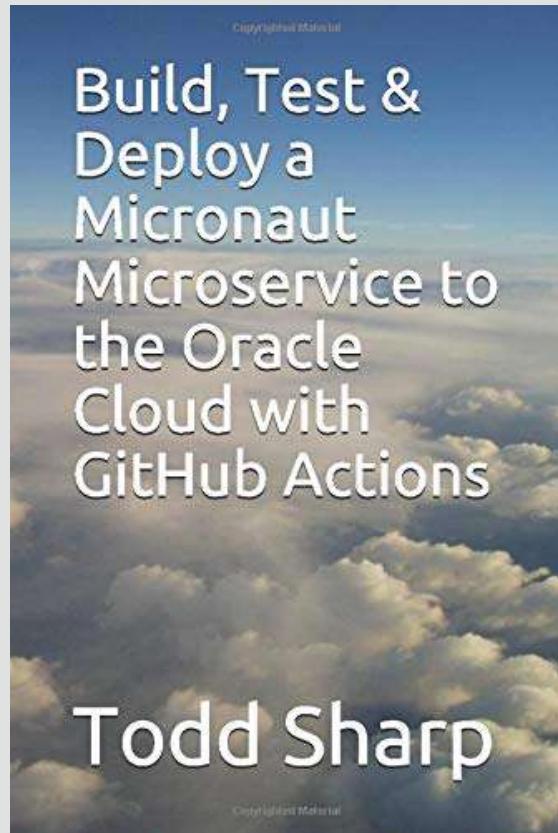
2 Block Volumes, 100 GB total. 10 GB Object Storage. 10 GB Archive Storage.



1 Load Balancer, 10 Mbps bandwidth. Monitoring, Notifications, Email Delivery, 5000 vault secrets

<https://www.oracle.com/cloud/free>

Buy The Book!



bit.ly/mn-oci-book

Linkage

- <https://github.com/recursivecodes/mn-oci-final>
- <https://blogs.oracle.com/developers/adventures-in-cicd-1-intro-getting-started-with-github-actions>
- <https://blogs.oracle.com/developers/adventures-in-cicd-2-building-publishing-a-jar>
- <https://blogs.oracle.com/developers/adventures-in-cicd-3-running-tests-publishing-test-reports>
- <https://blogs.oracle.com/developers/adventures-in-cicd-4-deploying-a-microservice-to-the-oracle-cloud-with-github-actions-oci-cli-edition>
- <https://blogs.oracle.com/developers/adventures-in-cicd-5-deploying-a-microservice-to-the-oracle-cloud-with-github-actions-gradle-plugin-edition>

Linkage

- <https://blogs.oracle.com/developers/adventures-in-cicd-6-adding-a-persistence-tier-to-our-microservice>
- <https://blogs.oracle.com/developers/adventures-in-cicd-7-testing-the-persistence-tier-with-testcontainers>
- <https://blogs.oracle.com/developers/adventures-in-cicd-8-deploying-a-microservice-with-a-tested-persistence-tier-in-place>
- <https://blogs.oracle.com/developers/adventures-in-cicd-9-deploying-a-microservice-as-a-docker-container>
- <https://blogs.oracle.com/developers/adventures-in-cicd-10-deploying-our-microservice-docker-container-to-kubernetes>
- [https://blogs.oracle.com/developers/oracle-cloud-vault-as-a-secure%, distributed config store for your micronaut applications](https://blogs.oracle.com/developers/oracle-cloud-vault-as-a-secure%2c-distributed-config-store-for-your-micronaut-applications)
- <https://recursive.codes/blog/post/50>

Contact Me

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