

# Microservices with Quarkus

## Day 2: Data Access & Security

## **Morning Session 1 (09:00 - 10:00)**

**Topic: Relational Databases with Panache ORM & Data Caching**

# What is Panache?

- Simplifying persistence with Hibernate ORM.
- Two patterns: Active Record vs. Repository.
- Overview of Panache Entities and Repositories.
- Demonstration of basic CRUD operations.
- Introduction to Data Caching with `@CacheResult` .

## **Morning Session 2 (10:45 - 11:45)**

**Topic: Implementing Persistence**

**Activity: Hands-on Lab 3**

## Lab 3 Objectives

- Implement data persistence for a microservice using Panache ORM.
- Create Panache Entity and Repository classes.
- Implement CRUD operations (Create, Read, Update, Delete).
- Integrate with a database using Dev Services (H2 or PostgreSQL).
- Write tests for persistence operations.

## **Morning Session 3 (12:00 - 12:30)**

**Topic: Exposing and Documenting REST Endpoints (Part 1)**

# Jakarta RESTful Web Services

- Core concepts: Annotations, injection, paths, media types.

# API Documentation with OpenAPI

- Automatically generate API documentation.
- Introduction to the integrated Swagger UI.



**Lunch Break (12:30 - 13:15)**

## Afternoon Session 1 (13:15 - 13:45)

### Topic: Exposing and Documenting REST Endpoints (Part 2)

- Briefly recap Jakarta REST & OpenAPI concepts.
- Mention GraphQL as an alternative for data exposure (not covered in detail).

## **Afternoon Session 2 (13:45 - 14:15)**

**Topic: Exposing Persisted Data via REST API**

**Activity: Hands-on Lab 4**

## Lab 4 Objectives

- Expose and document Panache entities via a REST API with OpenAPI.
- Create a REST endpoint for CRUD operations.
- Test the generated OpenAPI documentation.
- Test the endpoints using Postman, curl, or the Swagger UI.

## **Afternoon Session 3 (14:30 - 15:00)**

**Topic: REST Clients + OIDC & JWT Security**

# MicroProfile REST Client

- Creating a typed REST client interface.
- Injecting and using the client.

# Introduction to Security

- Core Concepts: OIDC, OAuth2, Identity Provider (e.g., Keycloak).
- Validating MicroProfile JWT tokens with SmallRye JWT.

## **Afternoon Session 4 (15:00 - 16:00)**

**Topic: Securing and Consuming a Protected API**

**Activity: Hands-on Lab 5**



## Lab 5 Objectives

- Configure security to connect to a pre-existing Keycloak instance.
- Secure an API using role-based access control ( `@RolesAllowed` ).
- Understand the OAuth2 authentication flow (token generation & validation).
- Test secure access with and without a valid JWT token.

# End of Day 2

- Recap & Q&A
- Preview of Day 3: Reactive Messaging & Monitoring

Day 2: Data Access & Security

Slide 15: Title Slide

Microservices with Quarkus

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Slide 16: Morning Session 1 (09:00 - 10:00)

Topic: Relational Databases with Panache ORM & Data Caching

Slide 17: What is Panache?

Simplifying persistence with Hibernate ORM