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# 1. Getting Started: Your First Quantum Application

This section walks through creating a simple multi-tenant Product catalog to demonstrate core Quantum concepts.

## 1.1. Prerequisites

- Java 17+
- Maven 3.8+
- MongoDB (local or cloud)
- Basic Quarkus knowledge (see [Quarkus Foundation](#))

## 1.2. Project Setup

Create a new Quarkus project with Quantum dependencies:

```
mvn io.quarkus:quarkus-maven-plugin:create \
    -DprojectGroupId=com.example \
    -DprojectArtifactId=product-catalog \
    -DclassName="com.example.ProductResource" \
    -Dpath="/products"
```

Add Quantum dependencies to `pom.xml`:

```
<dependency>
  <groupId>com.e2eq.framework</groupId>
  <artifactId>quantum-framework</artifactId>
  <version>${quantum.version}</version>
</dependency>
```

## 1.3. Configuration

Create `.env` file (copy from template):

```
MONGODB_USERNAME=your-username
MONGODB_PASSWORD=your-password
MONGODB_DATABASE=product-catalog
MONGODB_HOST=localhost:27017
JWT_SECRET=your-secret-key
```

Basic `application.properties`:

```
# MongoDB
quarkus.mongodb.connection-
```

```

string=${MONGODB_CONNECTION_STRING:mongodb://localhost:27017}
quarkus.mongodb.database=${MONGODB_DATABASE:product-catalog}

# JWT Authentication
auth.provider=custom
auth.jwt.secret=${JWT_SECRET:change-me-in-production}
auth.jwt.expiration=60

# CORS for development
quarkus.http.cors=true
quarkus.http.cors.origins=http://localhost:3000

```

## 1.4. Your First Model

Create a Product model with multi-tenancy built-in:

```

package com.example.model;

import com.e2eq.framework.annotations.FunctionalMapping;
import com.e2eq.framework.model.persistent.base.BaseModel;
import dev.morphia.annotations.Entity;
import lombok.Data;
import lombok.EqualsAndHashCode;
import lombok.NoArgsConstructor;
import lombok.experimental.SuperBuilder;

import jakarta.validation.constraints.NotBlank;
import jakarta.validation.constraints.Size;
import java.math.BigDecimal;

@Entity
@Data
@NoArgsConstructor
@SuperBuilder
@EqualsAndHashCode(callSuper = true)
@FunctionalMapping(area = "catalog", domain = "product")
public class Product extends BaseModel {

    @NotBlank
    @Size(max = 50)
    private String sku;

    @NotBlank
    @Size(max = 200)
    private String name;

    private String description;
    private BigDecimal price;
    private boolean active = true;
}

```

```
}
```

Key points: - Extends `BaseModel` for automatic `DataDomain`, audit fields, and ID management - `@FunctionalMapping` declares this model's business area and domain for security rules - Standard Jakarta validation annotations - Lombok reduces boilerplate

## 1.5. Repository

Create a repository interface:

```
package com.example.repository;

import com.e2eq.framework.model.persistent.morphia.MorphiaRepo;
import com.example.model.Product;

public interface ProductRepo extends MorphiaRepo<Product> {
    // Custom queries can be added here
}
```

## 1.6. REST Resource

Create a REST endpoint:

```
package com.example.resource;

import com.e2eq.framework.rest.resources.BaseResource;
import com.example.model.Product;
import com.example.repository.ProductRepo;
import jakarta.ws.rs.Path;

@Path("/products")
public class ProductResource extends BaseResource<Product, ProductRepo> {
    // Inherits all CRUD endpoints: GET, POST, PUT, DELETE
    // GET /products/list - paginated list with filtering
    // GET /products/id/{id} - get by ID
    // POST /products - create new product
    // PUT /products/set?id={id}&pairs=field:value - update fields
    // DELETE /products/id/{id} - delete product
}
```

## 1.7. Running the Application

Start your application:

```
./mvnw quarkus:dev
```

The application provides: - Swagger UI at <http://localhost:8080/q/swagger-ui/> - Dev UI at <http://localhost:8080/q/dev/>

## 1.8. Testing Your API

Create a product:

```
curl -X POST http://localhost:8080/products \
-H "Content-Type: application/json" \
-d '{
  "sku": "WIDGET-001",
  "name": "Super Widget",
  "description": "The best widget ever",
  "price": 29.99,
  "active": true
}'
```

List products:

```
curl "http://localhost:8080/products/list?limit=10&sort=+name"
```

Filter products:

```
curl "http://localhost:8080/products/list?filter=active:true&price:>##20"
```

## 1.9. What You Get Automatically

With this minimal setup, Quantum provides:

**Multi-tenancy:** Each product is automatically tagged with the creator's DataDomain (tenant, org, owner)

**Security:** DataDomain filtering ensures users only see their own data by default

**Validation:** Jakarta Bean Validation runs before persistence

**Audit Trail:** Automatic createdBy, createdDate, lastUpdatedBy, lastUpdatedDate fields

**Consistent APIs:** Standard REST patterns across all resources

**Query Language:** Powerful filtering with the ANTLR-based query syntax

**OpenAPI:** Automatic API documentation

## 1.10. Next Steps

- Add authentication: [Authentication Guide](#)

- Create sharing rules: [Permissions Guide](#)
- Learn the query language: [Query Language](#)
- See real-world example: [Supply Chain Tutorial](#)