TodoService Microservice Documentation

1. Overview

The TodoService microservice is responsible for managing tasks using a RESTful API. It follows a clean architecture and integrates with AWS services like **API Gateway, Lambda, DynamoDB, and SQS** to ensure scalability and reliability.

2. Architecture

The microservice is structured into the following layers:

- **API Layer**: Exposes endpoints via TodoTaskController.

- **Application Layer**: Contains business logic (TodoTaskService).

- **Domain Layer**: Defines core entities (TodoTask and Result<T>).

- **Infrastructure Layer**: Handles external integrations (API Gateway, DynamoDB, SQS).

- **Tests** : Includes unit tests.

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3. Components and Their Functionalities

3.1 API Layer

Component: TodoTaskController

- Handles HTTP requests and responses.

- Delegates task operations to the **Application Layer**.

- Routes:

    - POST /api/todo-tasks/CreateTask : Create a new task.

    - PUT /api/todo-tasks/Update : Update the title of an existing task.

    - PUT /api/todo-tasks/updateStatus{id} : Request status change.

Integration: Calls ITodoTaskService methods for task operations.

3.2 Application Layer

Component: TodoTaskService

- Implements business logic for managing tasks.

- Ensures validation and approval requirements are met.

- Interacts with **Infrastructure Layer** for external dependencies.

Integration:

- Calls TodoTaskRepository to interact with AWS Lambda (DynamoDB).

3.3 Domain Layer

Components:

- TodoTask : Represents a task with Id, Title, and Status.

- TodoTaskStatus : Enum defining task statuses (Todo, Doing, Done).

- Result<T> : Generic class for operation results (success/failure handling).

Integration: Used by the **Application Layer** to ensure consistent data handling.

3.4 Infrastructure Layer

Component: TodoTaskRepository

- Handles **task persistence** via AWS Lambda + API Gateway.

- Uses HttpClient to make signed requests to API Gateway.

Integration:

- TodoTaskService calls TodoTaskRepository for persistence.

3.5 Tests

Unit Tests

- TodoTaskServiceTests : Tests business logic in TodoTaskService.

- TodoTaskControllerTests : Validates controller behavior.

- TodoTaskRepositoryTests : Ensures repository logic correctly interacts with API Gateway.

4. External Integrations

- **API Gateway** : Routes requests to AWS Lambda for task persistence.

- **AWS Lambda** : Handles CRUD operations with DynamoDB.

- **Amazon SQS** : Queues approval requests for ApprovalService.