

Distributed Systems (CSE 530)

Question - 1

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Client-Server Files

seller.py Description (Client):

1. Purpose: Implements functionality for a seller in a marketplace, including server and client aspects for handling notifications and interacting with the market.
2. Key Components:
 - a. SellerServer: A GRPC servicer that receives notifications.
 - b. SellerClient: Manages seller activities such as registering, posting, updating, and deleting items for sale, and displaying seller items.
3. Functionalities:
 - a. Register as a seller with the marketplace.
 - b. Post new items for sale with details like name, category, price, quantity, and description.
 - c. Update and delete items based on seller inputs.
 - d. Display all items posted by the seller.
 - e. Seller user interface for performing the above activities interactively.
4. Communication: Uses GRPC for communication with the marketplace and notifications services.
5. Dependencies: grpc, shopping_pb2, shopping_pb2_grpc, notifications_pb2, notifications_pb2_grpc, uuid, and threading for concurrent operations.

buyer.py Description (Client):

1. Purpose: Facilitates buyer interactions with a marketplace, including searching, buying, adding to wishlist, and rating items, alongside receiving notifications.
2. Key Components:
 - a. BuyerServer: A GRPC servicer for receiving marketplace notifications.
 - b. BuyerClient: Manages buyer activities such as searching for items, buying, adding to wishlist, and rating items.

3. Functionalities:
 - a. Search for items by name and category.
 - b. Buy items specifying item ID and quantity.
 - c. Add items to wishlist by ID.
 - d. Rate purchased items by ID and rating.
 - e. Receives notifications and acknowledges them.
4. Communication: Uses GRPC for communication with the marketplace for transactions and notifications.
5. Dependencies: grpc, shopping_pb2, shopping_pb2_grpc, notifications_pb2, notifications_pb2_grpc, and threading for concurrent operations.

central_platform.py Description (Server):

1. Purpose: Serves as the central marketplace platform, managing items, sellers, buyers, and notifications.
2. Key Components:
 - a. MarketService: Core service class implementing marketplace functionalities like item registration, update, deletion, and listing, along with buyer-specific actions like search, buy, wishlist addition, and rating.
3. Functionalities:
 - a. Seller operations: Register, add, update, list, and delete items.
 - b. Buyer operations: Search for items, buy items, add items to wishlist, rate items.
 - c. Notifications: Send notifications to buyers and sellers on various actions (e.g., item bought, wishlist updates).
4. Communication: Utilizes GRPC for communication, including sending notifications through buyer and seller notification services.
5. Dependencies: grpc, shopping_pb2, shopping_pb2_grpc, notifications_pb2, notifications_pb2_grpc, uuid, and threading for concurrency.
6. Next, we'll examine the shopping_pb2.py file.

Proto and generate Files

shopping.proto Description:

1. Purpose: Outlines the data structures and services for a shopping platform, including item listings, seller and buyer actions, and rating systems.
2. Key Features:
 - a. Defines messages for items, including details like name, price, category, and ratings.

- b. Describes services for managing items (add, update, delete), searching items, and performing buyer actions (purchase, wishlist, rate).
3. Usage: Serves as the foundation for the GRPC services that enable interaction between the marketplace's buyers, sellers, and the central platform.

shopping_pb2.py Description:

1. Purpose: Contains protocol buffer definitions for the shopping service.
2. Key Features:
 - a. Defines Item message with fields like id, name, category, price, description, quantity, rating, and seller information.
 - b. Includes request and response messages for seller registration, item addition, update, deletion, listing, searching, buying, wishlist addition, and item rating.
 - c. Contains service definition Market with RPC methods for seller registration, item management, and buyer interactions.
3. Generated From: shopping.proto.
4. Dependencies: Utilizes Google's Protocol Buffers for structured data serialization.
5. Next, we will look into the shopping_pb2_grpc.py file.

shopping_pb2_grpc.py Description:

1. Purpose: Provides GRPC client and server classes for the shopping service defined in shopping_pb2.py.
2. Key Components:
 - a. MarketStub: Client class for calling the GRPC services.
 - b. MarketServicer: Server class to implement the services.
 - c. add_MarketServicer_to_server: Function to register the servicer with a GRPC server.
3. Functionality: Facilitates the communication between clients and the marketplace service, including operations like registering sellers, adding, updating, deleting items, and buyer interactions such as searching, buying, and rating items.
4. Generated From: Automatically generated by the gRPC Python protocol compiler plugin based on shopping.proto.
5. Next, we'll move on to the notifications_pb2.py file.

notifications.proto Description:

1. Purpose: Defines the structure and services for sending and receiving notifications between the server and clients (buyers and sellers).

2. Key Features:
 - a. Defines a Notification message for carrying notification content.
 - b. Includes a service with methods for clients to receive notifications and acknowledge them.
3. Usage: Used by the notification system to inform buyers and sellers about various events like item status changes, order updates, etc.

notifications_pb2.py Description:

1. Purpose: Contains protocol buffer definitions for notification services.
2. Key Features:
 - a. Defines Notification message with a message field for notification content.
 - b. Includes NotificationAck message with fields for success status and a response message.
 - c. Service definitions for BuyerNotifications and SellerNotifications with a method ReceiveNotification to handle incoming notifications.
3. Generated From: notifications.proto.
4. Dependencies: Utilizes Google's Protocol Buffers for structured data serialization.
5. Let's proceed to the notifications_pb2_grpc.py file.

notifications_pb2_grpc.py Description:

1. Purpose: Provides GRPC client and server classes for the notifications service defined in notifications_pb2.py.
2. Key Components:
 - a. BuyerNotificationsStub and SellerNotificationsStub: Client classes to send notifications.
 - b. BuyerNotificationsServicer and SellerNotificationsServicer: Server classes to receive and process notifications.
 - c. Functions to add servicer to a GRPC server, facilitating the setup of notification services for buyers and sellers.
3. Functionality: Enables the sending and receiving of notifications between the marketplace platform and users (buyers and sellers).
4. Generated From: Automatically generated by the gRPC Python protocol compiler plugin based on notifications.proto.

