DEMS(CORBA) Design Documentation

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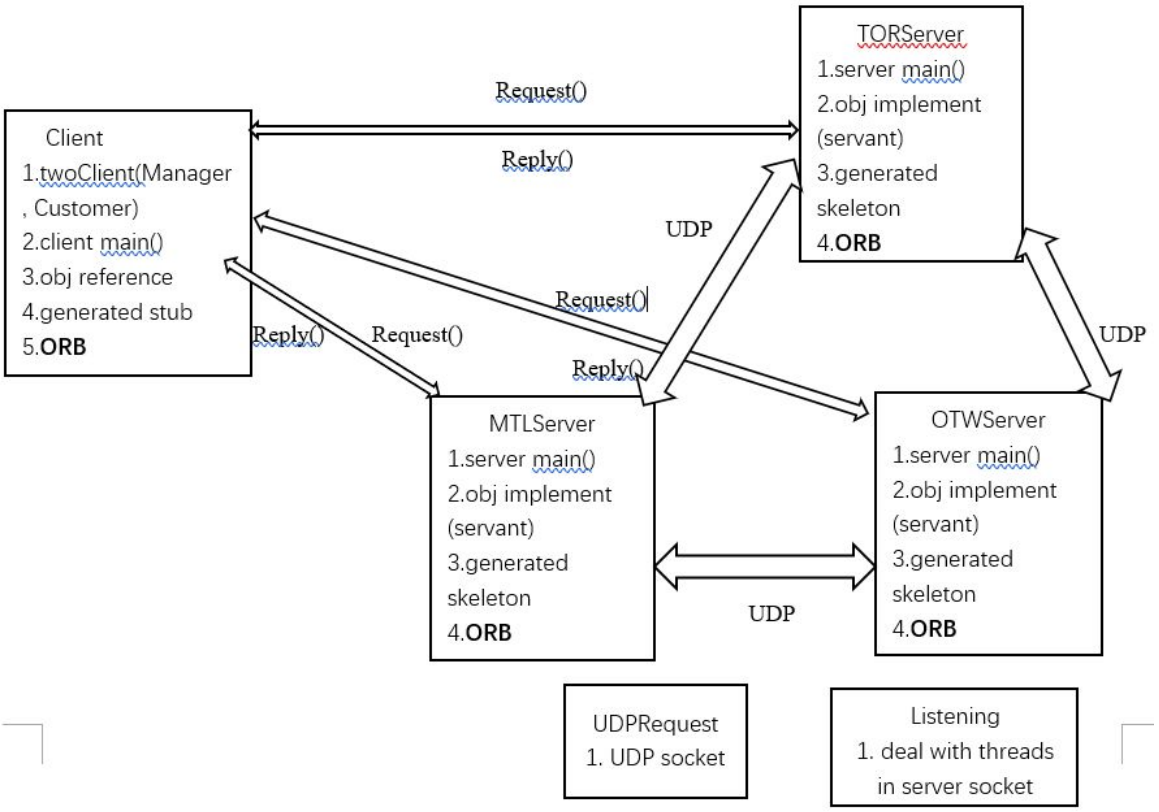
1. Techniques and architecture

Techniques: This assignment implements CORBA standard architecture using Java IDL and uses UDP/IP sockets to achieve inter-server communication.



2. Project file structure

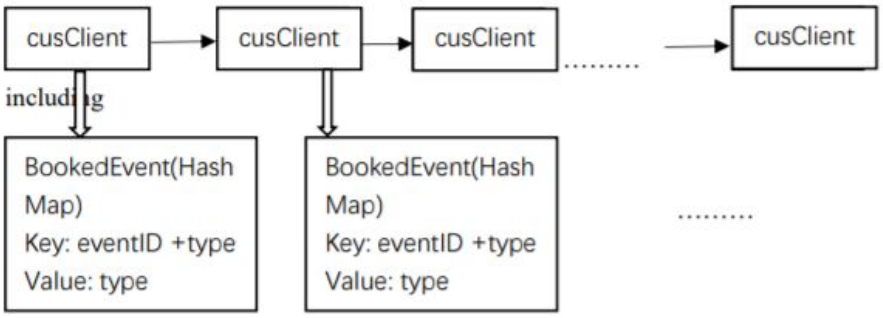
(1)Three Servers: MTLServer.java, OTWServer.java, TORServer.java
(2)Two Clients: ManagerClient.java, Customer.java
(3)Implementation: DEMSImpl.java
(4)UDP: UDPRequest.java, RequestExection.java, Listening.java
(5)IDL: corba.idl
(6)Generated by the idl file: _DEMSInterfStub.java, DEMSInterf.java, DEMSInterfHelper.java, DEMSInterfHelper.java, DEMSInterfHolder.java, DEMSInterfOperations.java, DEMSInterfPOA.java

- DEMSInterfPOA.java -> Server Skeleton
- _DEMSInterfStub.java -> Client Stub
- DEMSInterf.java -> java version of our idl interface file
- DEMSInterfHelper.java -> this cast object reference to their proper types
- DEMSInterfHolder.java -> it holds public instance of type DEMSInterf
- DEMSInterfOperations.java -> it contains methods that declared in interface

(7)Multithreading test: multiThread.java, multiManager.java, multiCustomer.java
(8)Logs: ClientLog Folder, ServerLog Folder

3. Data structure

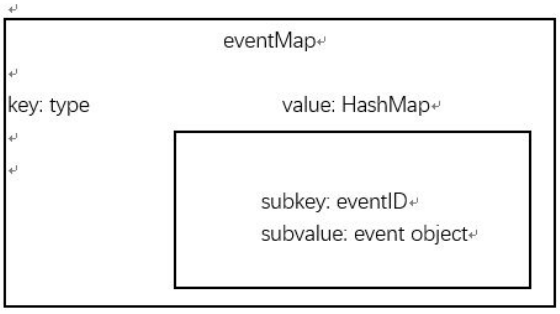
(1) LinkedList: cusClients
(2) HashMap: bookedEvent for each customerClient



(3) LinkedList: manClients

(4) LinkedList: bookedCus for each event

(5) Two Level HashMap:



4. Function realization

Swap Event:

swapEvent(String cusID, String newEventID, String newEventType, String oldEventID, String oldEventType)

First, determine whether the city of the customer is consistent with the city of the event being replaced. If the event to be replaced is not a local event, then the maximum event limit for booking foreign event per month is increased by one when the bookEvent method is called. Then the bookEvent function for the new event is executed, and if booking the new event is successful, the cancelEvent function for the old event continues. If the cancellation of the old event fails, the booked new event will be cancelled.

5. Important/Difficult part

The important part of this assignment is implementing CORBA standard architecture with Java IDL and using UDP/IP sockets to achieve inter-server communication.

About CORBA, it achieves programming language independence by using IDL to define its remote interface. It enables the collaboration between systems irrespective of the operating

system, programming language and hardware. ORB(Object Request Broker) is implemented both Server side and Client side, it takes care of routing all the request from the client to server and response from server to client. ORB core in Client-side, it contains interface definition. ORB core in Server-side, it handles activation/deactivation of objects.

About UDP programming, in term of sender, create a Datagram socket and bind it to UDP port, place data in byte array, create a datagram packet and specify data array and receiver's address, and invoke the send method with a reference to the packet; in term of receiver, create a datagram socket and bind it to a port, create a byte array to receive the data, create a datagram packet and specify the data array, and invoke the receive method of the socket with a reference the datagram packet.

6. Test case

Test ID	Case description	Function	Precondition	Test steps	Input data	Expected result	Test result	What to test
1	TORManager adds a new local city event	Add event	Starts three servers. Manager login.	Choose "add Event". Input eventID, eventType, capacity, topic	TORA070619 conference 10 IT	Add event successfully	As expected	Add new local city event
2	TORManager adds a new another city event	Add event	Starts three servers. Manager login.	Choose "add Event". Input eventID, eventType, capacity, topic	MTLA070619 conference 10 IT	Fail to add event.	As expected	Cannot add another city event
3	TORManager adds an existing event	Add event	Starts three servers. Manager login. The event exists.	Choose "add Event". Input eventID, eventType, capacity, topic	TORA070619 conference 10 IT	Fail to add event. Its capacity plus one.	As expected	Cannot add event existing, but add its capacity
4	TORManager removes a local city event without customer reservati	Remove event	Starts three servers. Manager login. The event exists.	Choose "remove Event". Input eventID, eventType	TORA070619 conference	Remove event successfully	As expected	Remove local city event

	on							
5	TORManager removes an another city event without customer reservation	Remove event	Starts three servers. Manager login. The event exists.	Choose “remove Event”. Input eventID, eventType	MTLA070619 conference	Fail to remove event	As expected	Cannot remove another city event
6	TORManager removes a local event with customer reservation	Remove event	Starts three servers. Manager login. Customer login. The event exists and customers booked it.	Choose “remove Event”. Input eventID, eventType	TORA070619 conference	Remove event successfully	As expected	Remove local city event and cancel it for all customers in it
7	Manager views the list of event availability	List event availability	Starts three servers. Manager login.	Choose “List event availability”. Input eventType	conference	Display the list	As expected	Display the list of available events in one type
8	TORCustomer books a local city event	Book event	Starts three servers. Customer login. The event exists.	Customer chooses “book Event”. Input eventID, eventType	TORA070619 conference	Book event successfully	As expected	Book lical city event
9	TORManager books event for a local city customer	Book event	Starts three servers. Manager login. The event exists. Customer did not book it.	Manager chooses “book Event”. Input CustomerID, eventID, eventType	TORC0001 TORA070619 conference	Book event successfully	As expected	Manager helps its local customer to book event
10	TORManager books event for another	Book event	Starts three servers. Manager login. The event exists.	Manager chooses “book Event”. Input	MTLC0001 TORA070619 conferen	Fail to book event	As expected	Manager don’t have power to help

	city customer			CustomerID, eventID, eventType	ce			unlocal customer operate
11	TORCustomer books an event in another city, no more than three times a month	Book event	Starts three servers. Customer login. The event exists.	Customer chooses “book Event”. Input eventID, eventType	MTLA070619 tradeshow	Book event successfully	As expected	Coustomer has limitation about the number of booking unlocal event
12	TORCustomer books an event in another city, more than three times a month	Book event	Starts three servers. Customer login. The event exists. Customer has booked three other cities events in one month.	Customer chooses “book Event”. Input eventID, eventType	OTWA070619 tradeshow	Fail to book event	As expected	Coustomer has limitation about the number of booking unlocal event
13	Customer books an event which has 0 capacity	Book event	Starts three servers. Customer login. The event exists. The number of people who booked the event is equal to its capacity.	Customer chooses “book Event”. Input eventID, eventType	TORA070619 conference	Fail to book event	As expected	When the event is not available, customer can’t book this event
14	Customer views the booking schedule	Get booking schedule	Starts three servers. Customer login.	Customer chooses “ get booking schedule”.		Display all events booked	As expected	Display all events booked of one customer
15	TORManager views the booking schedule of local city	Get booking schedule	Starts three servers. Manager login.	Manager chooses “ get booking schedule”. Input CustomerID	TORC0001	Display all events booked for that customer	As expected	Manager views local customer schedule

	customer							
16	TORManager views the booking schedule of another city customer	Get booking schedule	Starts three servers. Manager login.	Manager chooses “ get booking schedule”. Input CustomerID	MTLC0002	Fail to get	As expected	Manager cannot view another city customer schedule
17	Customer cancels a booked event	Cancel event	Starts three servers. Customer login. The event exists. Customer booked this event.	Customer chooses “ cancel event”. Input eventID, eventType	TORA070619 conference	Cancel event successfully	As expected	Cancel booked event
18	Customer cancels an unbooked event	Cancel event	Starts three servers. Customer login. The event exists.	Customer chooses “ cancel event”. Input eventID, eventType	TORA070619 tradeshow	Fail to cancel event	As expected	Cannot cancel unbooked event
19	TORManager cancels an event for local city customer	Cancel event	Starts three servers. Manager login. Customer login. The event exists. Customer booked this event.	Manager chooses “ cancel event”. Input CustomerID, eventID, eventType	TORC0001 TORA070619 conference	Cancel event successfully	As expected	Manager cancels events for local customer
20	TORManager cancels an event for another city customer	Cancel event	Starts three servers. Manager login. Customer login. The event exists. Customer booked this event.	Manager chooses “ cancel event”. Input CustomerID, eventID, eventType	MTLC0002 TORA070619 conference	Fail to cancel event	As expected	Manager cannot cancel events for another city customer
21	MTLCustomer swaps a	swap event	Starts three servers. Managers	Customer chooses “swap	TORA070719 conferen	Fail to swap events	As expected	When the customer has

	new nonlocal event with an old local event when there are three nonlocal events and one local event in booking list		login. Customer login. The events exist. Customer has booked three nonlocal events in a month and one local event.	event". Input new eventID, new eventType, old eventID, old eventType.	ce MTLA07 0719 conferen ce			booked three nonlocal events in a month, he can not swap a new nonlocal event in that month with an old local booked event.
22	MTLCust omer swaps a new nonlocal event with an old nonlocal event when there are three nonlocal events in booking list	swap even t	Starts three servers. Managers login. Customer login. The events exist. Customer has booked three nonlocal events in a month.	Customer chooses "swap event". Input new eventID, new eventType, old eventID, old eventType.	TORA07 0719 conferen ce TORE07 0719 tradesho w	swap events succes sfully	As expe cted	When the customer has booked three nonlocal events in a month, he can swap a new nonlocal event with an old nonlocal event.
23	Customer swaps a new event with an old event which was not booked	swap even t	Starts three servers. Managers login. Customer login. The events exist.	Customer chooses "swap event". Input new eventID, new eventType, old eventID, old eventType.	MTLA07 0719 conferen ce MTLE07 0719 tradesho w	Fail to swap events	As expe cted	Customer cannot swap the old event which was not booked
24	Customer swaps a new event which	swap even t	Starts three servers. Managers login. Customer	Customer chooses "swap event". Input new eventID,	TORA07 0719 conferen ce TORA07	Fail to swap events	As expe cted	Customer cannot swap the new event

	has been booked with an old event.		login. The events exist. Customer has booked an event.	new eventType, old eventID, old eventType.	0719 conferen ce			which has been booked