CS454 A3 Documentation and System Manual

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1. Marshalling and unmarshalling of data

We use char buffer to send and receive rpc calls, the message start with its message type (ex: REGISTER), then followed by the server identifier's length which used to receive the server identifier, next read in the port number followed by the function name's length and the function name, and also all the argument type's length follow by the actual arguments' type.

2. Structure of your binder database

We built two objects to help us manage the database. The first one is the **Function** object which has its function name, argument type and size. The second one is **Server** object which has its server identifier, port number and socket number. Then we used a list to manage all available server in a queue and also apply round robin algorithm. To associate the relationship between functions and its host server, we used a map to create a key value pair so that binder can quickly find the correct server for client to access using a function's interface as a key.

3. Handling of function

We allow function overloading in our map structure, which means function with same function name, but different argument can exit together and accessed differently.

4. Managing round-robin scheduling

Every time a server is served, it will be popped back to the end of our server queue. So that this server will not serve again until all other servers have also served a request, unless there is no other server that can serve the request.

5. Termination procedure

Binder will be send a terminate message to all server when client want them to be terminated.

Error codes:

```
COMPLETE = 0,
SKELETON_NOT_FOUND = 1,
SKELETON_HAS_ALREADY_REGISTERED = 2,
NOT_INIT = -1,
FAIL_TO_CONNECT = -2,
UNEXPECTED_MESSAGE = -3,
HOSTNAME_ERROR = -4,
INVALID_FD = -5,
INVALID_ARGTYPE = -6,
INVALID_NAME = -7,
INVALID_SKELETON = -8,
FAIL_TO_BIND = -9,
FAIL_TO_LISTEN = -10,
NOT_REGISTER = -11,
FAIL_TO_ACCEPT = -12,
MESSAGE_TYPE_ERROR = -13,
INVALID_PORT = -15,
FAIL_TO_REGISTER = -16
```

Incomplete functionality: None