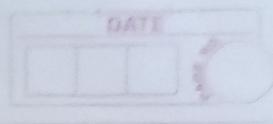
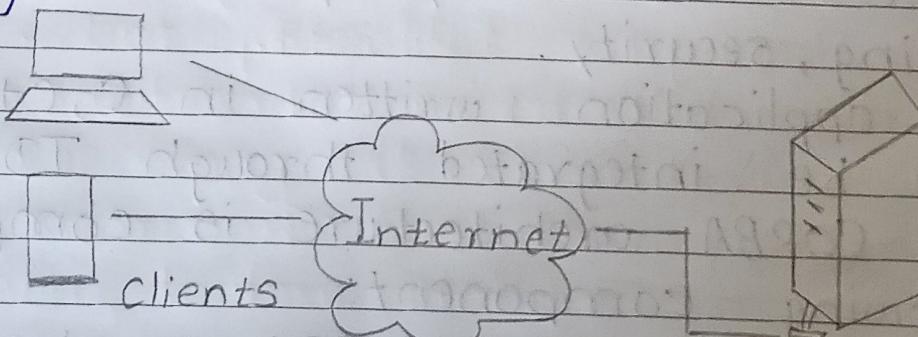


## Assignment No. 2



Q.1. Explain the client-server Architecture.

- i) This is the early age technology which separates the roles of computers as client and server. This technology is still powerful and popular amongst the network technologies to establish communication between two or more machines.
- ii) The early stage of this technology used two-tier business applications.
- iii) In this model, the first (upper) tier handles the presentation and business logic of the user application (client), and the second/lower tier handles the application organization and its data storage (server).
- iv) In general, the server is a database server that is mainly responsible for the organization and retrieval of data. The application client handles the user interaction through variety of graphical user interface of the application.
- v) For example, the client-server model has been widely used in Enterprise Resource Planning (ERP), billing, and Inventory application systems, banking etc.



Q. 2.

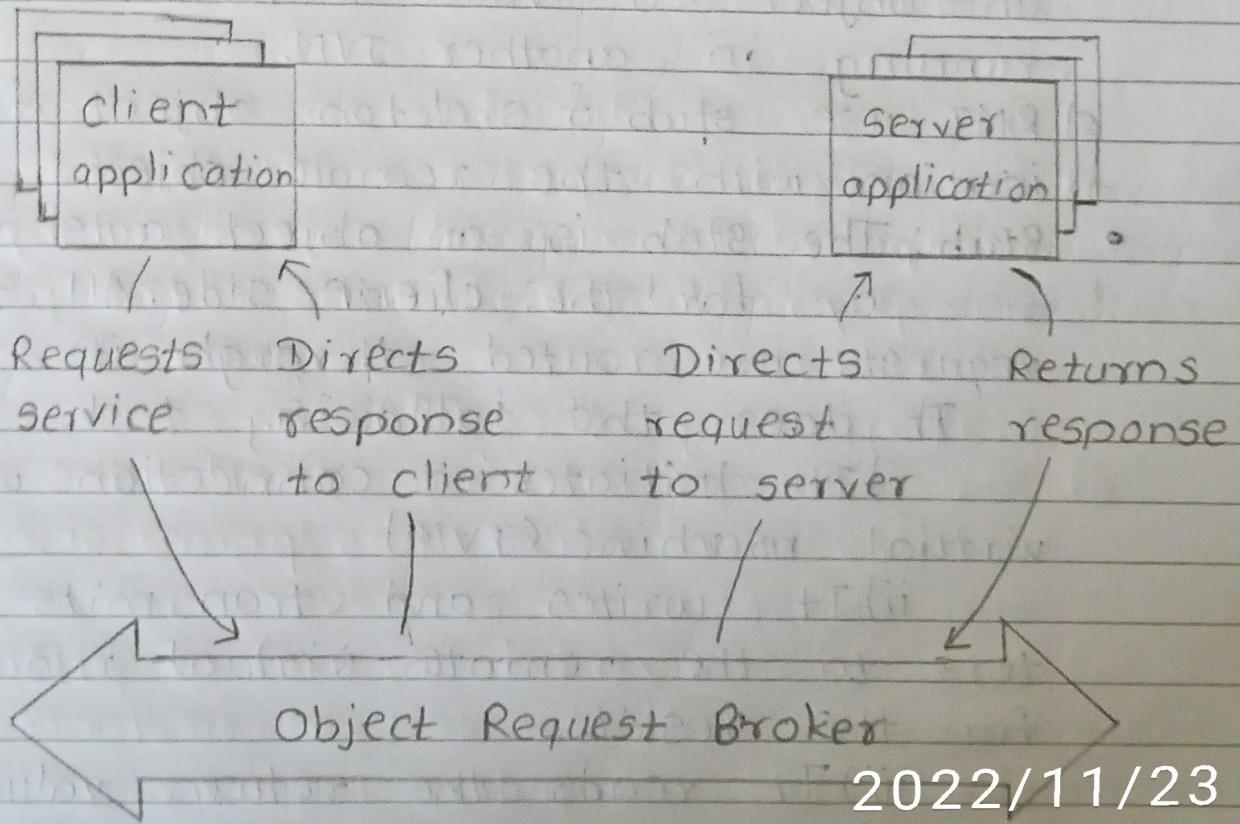
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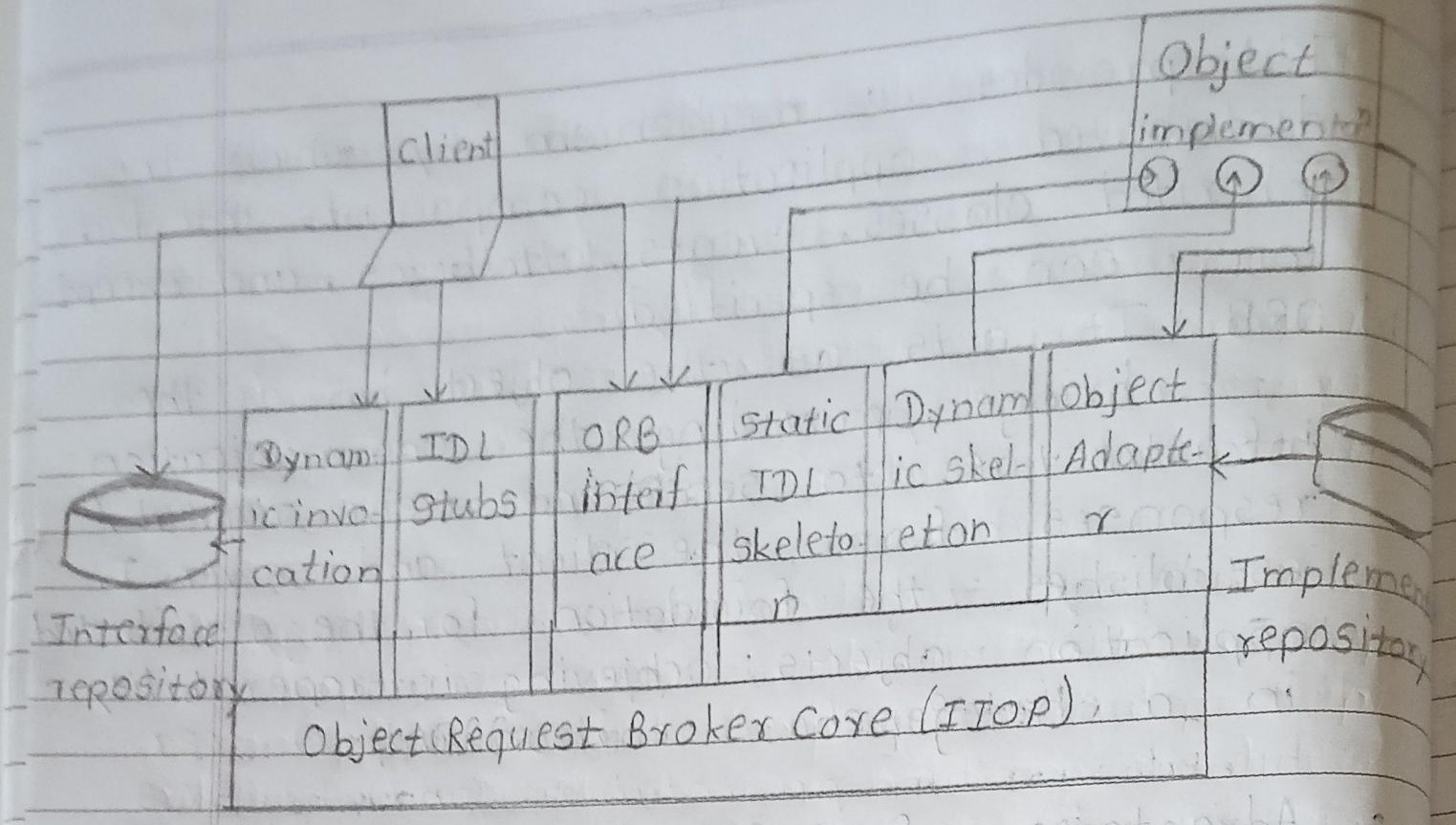
IDL provides a mechanism by which the distributed application components interfaces, inherited classes, events, attributes, and exceptions can be specified.

b) ORB : It acts as the object bus or the bridge , providing the communication infrastructure to send and receive request / responses from the client and server. It establishes the foundation for the distributed application objects, achieving interoperability in a heterogeneous environment.

- Advantages of CORBA -

- i) OS and programming-language independence
- ii) Legacy and custom application integration
- iii) Rich distributed object infrastructure.
- iv) Location transparency.



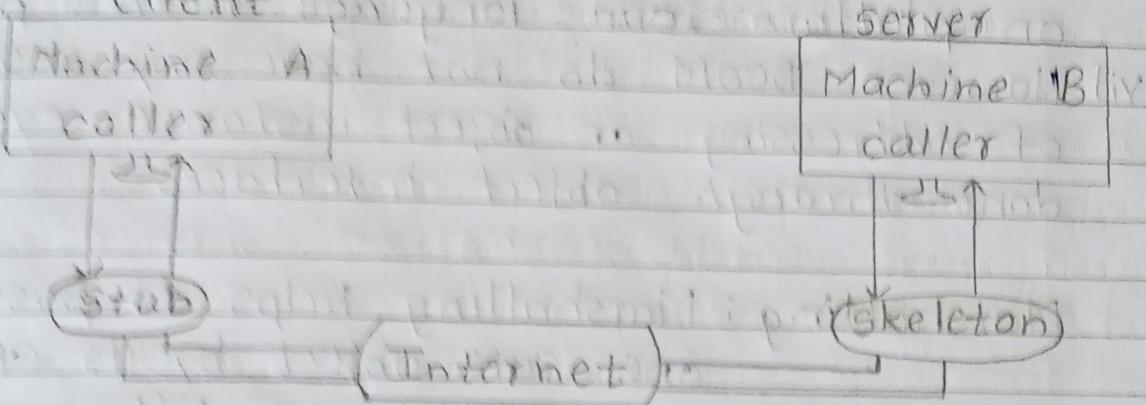


### Q.3. Explain Java RMI.

- i) The RMI (Remote Method Invocation) is an API that provides a mechanism to create distributed application in java. The RMI allows an object to invoke methods on an object running in another JVM.
- 2) RMI use stub & skeleton object for communication with the remote object.
- Stub: The stub is an object acts as a proxy for the client side. All the outgoing requests are routed through it.  
It does the following task.
  - i) It initiates a connection with remote virtual machine (JVM).
  - ii) It writes and transmits the parameters to the remote virtual machine & wait for the result.
  - iii) It reads the return value or exception & it finally returns the value to the client.

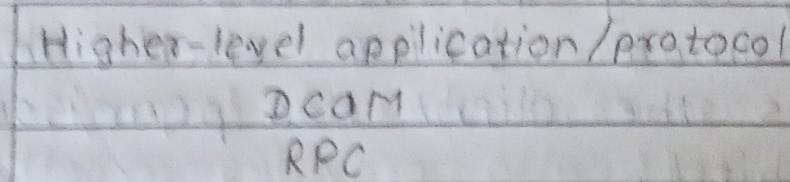
**Skeleton:** The skeleton is an object that acts as a gateway for the server-side object. All the incoming requests are routed through it.

- i) It does following tasks:
  - ii) It reads the parameter for the remote method.
  - iii) It invoke the method on the actual remote method object and it write & transmits the result to the caller.



#### Q4. Explain Microsoft DCOM.

→ It is a remote protocol designed by Microsoft to invoke RPCs. It consists of a set of extensions layered on the Microsoft Remote Procedure Call Extensions.



**DCOM protocol stack:** Higher-level applications use the DCOM client to obtain object references or make ORPC call on

the object. The DCOM client uses the Remote Procedure Call Protocol Extensions, to communicate with the object server.

- ii) The object server constitutes an object registration service and one or more object exporters. Objects are contained in object exporters.
- iii) DCOM is language and platform independent.
- iv) DCOM is a binary standard.
- v) DCOM provides the ability to use and reuse components dynamically, without recompiling, on platform and language neutral principle.
- vi) However DCOM do not have any absolute way of addressing an object instance - everything is done through object interfaces.

Marshalling: Marshalling helps to pass data from one COM object by its CLSID or instance to another on a different computer.

The steps in DCOM communication

- i) The client computer requests the remote computer to create an object by its CLSID using or PROGID. If the client passes the APPID, the remote computer looks up the CLSID using the PROGID.
- ii) The remote machine checks the APPID and verifies the client has permissions to create the object.
- iii) DCOMLaunch.exe (if an exe) or DLLHOST.exe (if a dll) will create an instance of the class the client computer requests.
- iv) The communication gets established.

v) The client can now access all function in the class on the remote computer.