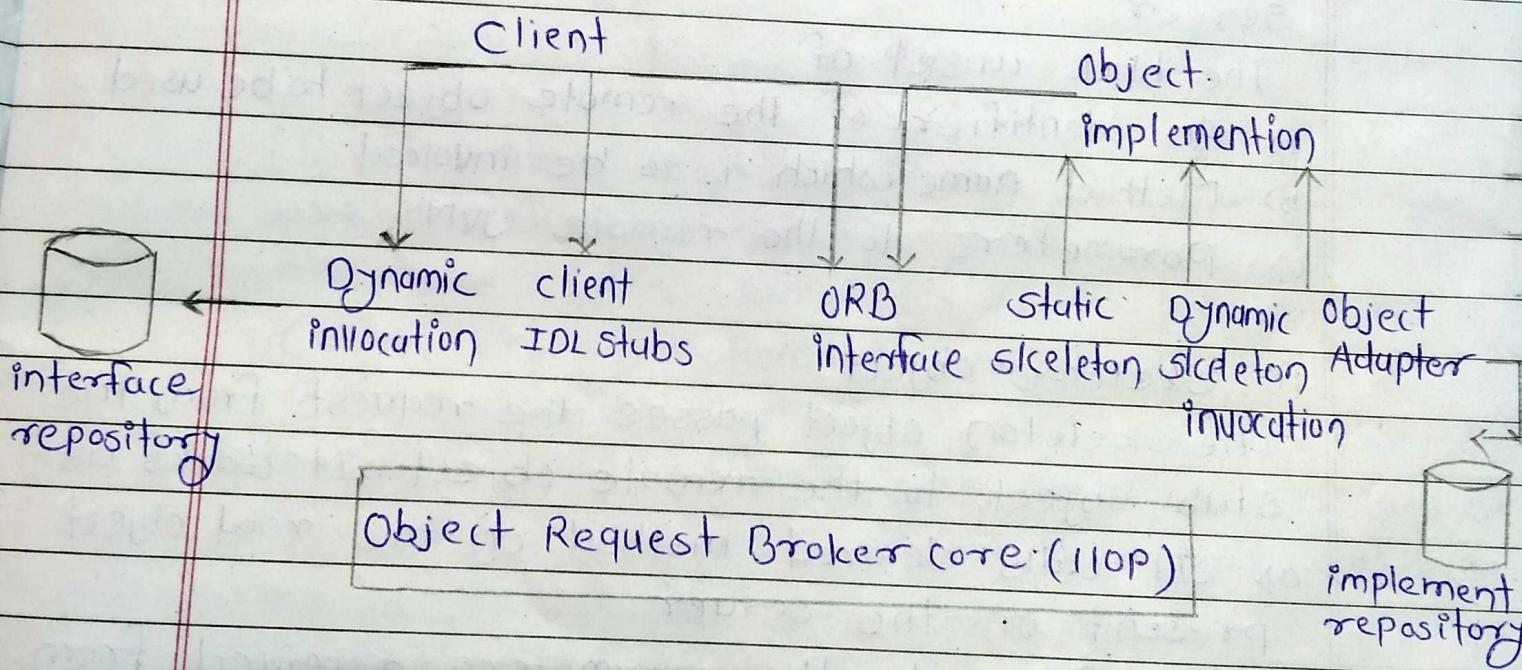


# Assignment - 3

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- Q.2) CORBA (common object Request Broker Architecture)
- - Written in C, C++ in Java & integrated throw ideal binding.
  - Develop by the object management group.
  - "A collection of system level service for handling low level application services life cycle persistence transaction naming security".
  - It consists of two system.
    - Client
    - Object implementation (server)



3>

Javam - ( Remote Method Invocation )

- As the name specifies Java invented RMI APIs for communicating methods on any machine remotely.

This is pure Java solution for handling distributed communication.

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Through RMI object running on a client computer can invoke methods on an object present on server.

### Working of RMI

There are two special objects designed to establish communication between client & server.

- i) Stub object (client side)
- ii) Skeleton object (server side)

#### i) Stub object

The stub object on the client machine builds an information block & sends this information to the server.

The block consists of

- a) An identifier of the remote object to be used
- b) Method name which is to be invoked
- c) Parameters to the remote JVM

#### ii) Skeleton object

The skeleton object passes the request from the stub object to the remote object. It works as:

- a) It calls desired method on the real object present on the server.
- b) It forwards the parameters received from the stub object to the method.

### Steps to implement Interface

- i) Defining a remote interface
- ii) Implementing the remote interface
- iii) Creating Stub & Skeleton objects from the

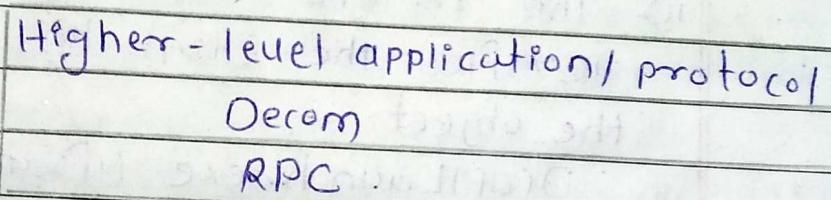
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- implementation class using `moc` (`mi compiler`)
- v) Start the `miregistry`
  - v) Create & execute the server application program
  - v) Create & execute the client application program.

#### 4) Microsoft DCOM

→ (Distributed Component Object Model)

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 calls on the object. The DCOM Client uses the Remote procedure call Protocol Extensions, to communicate with the object server. The object server constitutes an object resolver service & one or more object exporters. Objects are contained in object exporters.

DCOM is language & platform independent.

DCOM is a binary standard.

DCOM provides the ability to use & reuse components dynamically, without recompiling as platform & language neutral principle.

However DCOM do not have any absolute way of addressing an object instance - everything

done through object interface.

Marshalling : Marshalling helps to pass data from one COM object instance to another on different computer.

The steps in DCOM communication

- i) The client computer requests the remote computer to create an object by its CLSID 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 & 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 requested.
- iv) The communication gets established.
- v) The client can now access the all functions in the class on the remote computer.

5) What is the role of J2EE in distributed computing?

→ Sun Microsystems provides specifications for a comprehensive suite of technologies to solve large scale distributed system problems.

This suite is the Java 2 Enterprise Edition, commonly known as J2EE.

In this discussion we will discuss the architecture of J2EE & how it can be used to develop multi-tiered applications.

The emergence of the Internet has helped enterprise applications to be easily accessible over the web without having specific client-side software installations. In the Internet based enterprise application model, the focus was to move the complex business processing toward centralized servers in the back end. The 1st generation of Internet servers was based upon web servers that hosted static web pages & provided content to the client via HTTP. HTTP is a stateless protocol that connects web browsers to web servers, enabling the transportation of HTML content to the user.

This evolution lead to the specification of J2EE architecture, which promoted a much more efficient platform for hosting web-based applications.

J2EE provides a programming model based upon web & business components that are managed by the J2EE application server.

J2EE also provide excellent client connectivity capabilities, ranging from PDA to web browsers to Rich clients (Applets, CORBA applications, & standard Java Applications). Various components of the J2EE architecture. A typical J2EE architecture is physically divided in to three logical tiers, which enables clear separation of the various application components with defined roles & responsibilities. The following is a breakdown of functionalities of those logical tiers.

I) Presentation tier

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III) Integration tier.

6)

→ Explain the use of XML in distributed computing  
 XML is pure data description, not tied to any programming language, operating system or transport protocol. In the grand scheme of distributed computing this is radical idea. The implication is that we don't require lock-in to programmatic infrastructure to make data available to web-connected platforms.

In this first of a new series on the XML based revolution in distributed computing, Frank Copley looks at XML-RPC as an alternative to code-centric distributed computing models.

XML is a specification for adding semantic meaning to data by allowing users to define their own vocabularies in the form of descriptive tags. The combination of tags & content comprise an XML document. For example, Listing 1 illustrates the use of XML to describe invoice data.

7)

What is service oriented architecture. Explain key characteristics of SOA (service oriented architecture)

→

Service-oriented architecture (SOA) is a method of software development that uses software components called services to create business applications. Each service provides a business capability, & services can also communicate with each other across platforms & languages. Developers use SOA to reuse services in different systems to combine several independent service complex tasks.



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### Characteristics

- It supports loose coupling everywhere in the project.
- SOA supports interoperability.
- It increases the quality of service.
- It supports vendor diversity.
- It promotes discovery & federation.
- It is location-transparent.
- It is still maturing & achievable idea.

8) What is stateless & statefull services explain with example.

#### → Stateless

A stateless architecture or application is a type of Internet protocol where the state of the previous transaction is neither stored nor referenced in subsequent transactions. Each request sent between the sender & receiver can be interpreted & does not need either requests for its execution. This is a protocol where a client & server requests & response are made in a current state. In addition, the status of the current session is not retained or carried over the next transaction.

Stateless applications manage short term requests using print servers & a Content Delivery Network (CDN). An excellent example of Stateless protocol at work is in the sending

of an SMS.  
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## Stateful

Stateful architecture or application describes a structure that allows users to store, record & return to already established information & processes over the internet. It entails transactions that are performed using past transactions as reference point. In stateful applications, the current transaction can be affected by the previous ones.

A stateful application maintains the state of every session irrespective of the importance. Stateful architecture is used as a foundation for several existing technologies today. The File Transfer protocol & the Telnet were good examples of stateful architecture. The key advantages of the statefull concept.

- Examples of the stateless protocol are UDP (User Datagram protocol), HTTP
- Examples of the stateful protocol are Telnet, FTP (File Transfer protocol).

q) Explain any one web technology in detail used for implementing web services.

- 
- HTTP - The de facto standard for the internet
  - XML - The de facto standard for data message interpretation.

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WSDL - Standard for interface definition.

UDDI - The web service registry.

i. SOAP (Simple Object Access Protocol)

It is an XML-based communication protocol to exchange information between computers.

Different applications can communicate using the protocol.

It frames format for sending messages.

It is platform as well as language independent protocol.

ii. UDDI (Universal Description, Discovery & Integration)

UDDI presents specification for a distributed registry of web services.

It is platform independent, open framework.

UDDI uses SOAP, CORBA & Java RMI protocol for its communication.

UDDI uses WSDL to describe interface to web services.

It is an open industry initiative that enables businesses to discover each other & define how they interact using the Internet.

iii. WSDL (Web Services Description Language)

WSDL is joint development of Microsoft & IBM.

It is an XML based protocol to exchange information in decentralized & distributed environment.

It is the standard format for describing a web service.

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It describes how to access a web services & what operations it performs.

Using this language one can understand how to interface with XML-based services.

It is an integral part of UDDI, an XML-based worldwide business registry.

WSDL is the language that UDDI uses.

10) What are RPC.

→ RPC (Remote Procedure Call) is a software communication protocol that one program can use to request a service from a program located in another computer on a network without having to understand the network's details. RPC is used to call other processes on the remote systems like a local system. A procedure call is also sometimes known as a function call or a subroutine call.

RPC uses the client-server model. The requesting program is a client, & the service-providing program is the server. Like a local procedure call, an RPC is a synchronous operation requiring the requesting program to be suspended until the results of the remote procedure are returned. However, the use of lightweight processes or threads that share the same address space enables multiple RPCs to be performed concurrently.



- 1) What are the features of SOAP?
- - Simple object Access Protocol.
- SOAP has the following features:
- Protocol independence, Language independence,
- Platform & operating system independence.
- It is used to broadcast a message over the network.
- It is used to call remote procedures & exchange documents.
- It uses the XML format to send message over the HTTP protocol.

