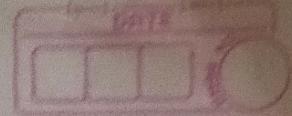


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Sub : Web Services
Assignment - III

Assignment -III



④ What is the Role of J2EE in distributed Computing?

⇒

A distributed system is a collection of individual system that coordinate and communicate with each other by sharing information over the network.

It works on client/ server or peer-to-peer model.

A distributed application uses the layered approach to software development using middleware. Middleware provides a common set of services for applications and has to work in heterogeneous environment.

Here the use of J2EE helps the developers to develop platform independent tools.

J2EE Development Tools :-

① Analysis and Design Tool :-

Use of UML diagrams helps in visualizing the system. The Tools like Rational Rose is used.

② Development Tools :-

The development IDE tools speed the development. It results in faster performance of the system.

The most commercial IDEs available on J2EE projects are -

WebGain Studio, Borland's JBuilder and IBM's visual Age.

WebLogic Studio is a complete J2EE development environment.

③ Build Tools :-

Once the project is developed it has to be built for execution and deployment. As the system works in different environments the deployment tools are required.

J2EE have its own build tools to support this phase of project development.

④ Source Code Control Tool :-

J2EE maintains a shared repository for the code base in various phases of project development.

Different developers in a team have their own codes timely updated.

This should be very well coordinated with other developers. The repository helps to assemble different versions of the codes centrally.

⑤ Testing Tools :-

The various utilities perform various types of testing on project components. There are different types of tests performed on the code like -

i) Unit / Functional testing

ii) System Testing

iii) Integration Testing

iv) Functional Testing

v) User acceptance testing

⑥ Problem Tracking Tool :-

This tool takes care of integrating modules to construct the overall system.

⑦ Testing and Deployment in J2EE :-

J2EE applications are difficult to test and deploy. The difficulty levels occur because of distributed nature of the system.

② Explain the use of XML in Distributing Computing.

⇒ XML is the extensible Markup language, which allows multiple languages to come together and make the information base.

XML provides the basis for a wide variety languages for example - Mathematical Markup Language (MathML). XML consists of both markup and content.

Markup describes to the tags that describes the content in the document. This flexible representation of data allows to easily send and receive data, and transform data from one format to another.

Some specialized uses of XML are the Java Speech Markup Language and the Synchronized Multimedia Integration Language.

Each XML language has its own grammar and the specific set of rules.

governing the content and structure of documents written in that language.

An XML-based work enables high levels of component reuse and interoperability in the distributed system.

What is Service Oriented Architecture?

⇒ & its characteristics?

The SOA is a software design and software architecture design pattern based on distinct pieces of software providing application functionality as a service to others.

The Service-Oriented architecture (SOA) is an evolution of distributed computing based on the request-reply design for synchronous and asynchronous applications.

Service-Oriented Architecture have the following key characteristics-

i) SOA services use XML and Web Services Description Language (WSDL) as the standard to describe the services. These are platform independent standards and so they help to distribute the applications over web.

ii) SOA services communicate with messages formally defined via XML also called XSD. Communication among clients and service providers or services is always in the heterogeneous environments.

iii) SOA services are maintained in the



enterprise by a registry that acts as a directory listing. Applications can look up the services in the registry and invoke the service. Universal Description, Definition, and Integration (UDDI) is the standard used for service registry.

④ Each SOA service has a quality of service (QoS) associated with it. Its important elements are security requirements, such as authentication and authorization, reliable messaging, and policies regarding who can invoke services.

⑤ With SOA, the hardware, operating systems and softwares can be used as a service.

What is Service Oriented Architecture?

Service Oriented Architecture (SOA) is a stage in the evolution of application development and/or integration. It defines a way to make software components reusable using the interfaces.

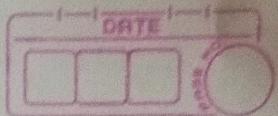
formally, SOA is an architectural approach in which applications make use of services available in the network

In this architecture, services are provided to form applications, through a network call over the internet.

It uses common communication standards to speed up and streamline the service integrations in applications.

Each service in SOA is a complete business function in itself.

The services are published in such a way that it makes it easy for the developers to assemble their apps using those services.



Explain any one web technology in details used for implementing web service.

→ WSDL, UDDI and SOAP are the three core technologies most often used to implement web services.

④ SOAP :-

Simple Object Access Protocol (SOAP) is a network protocol for exchanging structured data between nodes.

It uses XML format to transfer messages.

It works on top of application layer protocols like HTML and SMTP for notations and transmission.

SOAP allows processes to communicate throughout platforms, languages and operating systems, since protocols like HTTP are already installed on all platforms.

Message format :-

SOAP message transmits some basic information as given below:-

- * Information about message structure and instructions on processing it.
- * Encoding instructions for application defined data types.
- * Information about Remote Procedure calls and their responses.

The message in XML format contains three parts:-

① Envelope:-

It specifies that the XML message is a SOAP message. A SOAP message can be defined as an XML document containing header and body encapsulated in the envelope. The fault is within the body of the message.

② Header:-

This part is not mandatory. But when it is present it can provide crucial information about the applications.

③ Body:-

It contains the actual message that is being transmitted. Fault is contained within the 'body' tag.

④ Fault:-

This section contains the status of the application and also contains errors in the application. This section is also optional. It should not appear more than once in a SOAP message.

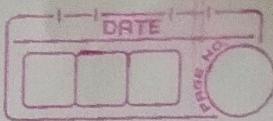
* Advantages of SOAP:-

① SOAP is lightweight data interchange



protocol because it is based on XML.

- ⑤ SOAP was designed to be OS and platform independent.
- ⑥ It is built on top of HTTP which is installed in most systems.
- ⑦ It is suggested by W3 consortium which is like a governing body for the Web.
- ⑧ SOAP is mainly used for Web services and Application Programming Interfaces (APIs).



What is stateless and stateful services? Explain with example.



Stateless Services:-

In stateless services Client send request to the server and server response back according to current state. It does not require the server to retain session information or a status about each communicating partner for multiple request.

Ex :- HTTP (Hypertext Transfer Protocol), UDP (User Datagram Protocol), DNS (Domain Name System).

Stateful services :-

In stateful services if client send a request to the server then it expects some kind of response, if it does not get any response then it resend the request.

Rx: FTP (file Transfer Protocol), Telnet.

What are the RPC?



RPC :-

RPC means Remote Procedure Call.

RPC 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.

RPC is a powerful technique for constructing distributed, client-server based applications.

RPC uses the client-server model.

The requesting program is a client, and 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 call returned.

However, the use of lightweight processes or threads that share the same address space enables multiple RPCs to be performed concurrently.

⇒ What are the features of SOAP?

SOAP (Simple Object Access Protocol) is a message protocol that enables the distributed elements of an application to communicate.

The following are the features of SOAP :-

- ① Protocol independence
- ② Language independence
- ③ Platform and operating system independence
- ④ It is used to broadcast a message over the network.
- ⑤ It is used to call remote procedures & exchange documents.
- ⑥ It uses the XML format to send message over the HTTP protocol.
- ⑦ SOAP is an lightweight protocol.