**NAME: PETER EMANUEL KIMINDU**

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**COURSE: COMPUTER SCIENCE**

**UNIT: COMP 361 {ADVANCED SOFTWARE ENGINEERING}**

**ASSIGNMENT 1.**

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**FACULTY OF SCIENCE**

**EGERTON UNIVERSITY**

**Assignment**

1. **Web service**

This is a piece of software that makes itself available over the internet and uses standardized XML messaging system in exchanging of data between applications or systems.

**It entails of the following properties**

* Is available over the internet private networks.
* Uses standardized XML messaging system
* Is not tied to any operating system or programming language
* Its discoverable over simple findmechanism

**2. Functionality of Web services**

Web services allows various applications to talk to each other and share data and services among themselves. Other services can also use the web services and vice versa. They make the application platform and technology independent.

Web services uses standardized industry standard protocol for the communication .All 4 layers uses well defined protocols in the web services protocol stack. This helps in providing platform for several applications written in different languages.

Web services uses SOAP over HTTP protocol, so you can use your existing low-cost internet for implementing web services.

3.**Compare CORBA and other Web services.**

**CORBA-**Common object Request broker Architecture.

This is a standard defined to facilitate the communication of systems that are deployed on diverse platforms. It uses object oriented model although the systems using Corba do not have to be object oriented **.**

**Web services-** This is a piece of software that makes itself available over the internet and uses standardized XML messaging system in exchanging of data between applications or systems.

Web services are grouped into 2 kinds (i) Simple Object Access Protocol (SOAP)

(ii) REST (Representational state transfer

SOAP- defines a standard communication protocol (set of rules) specifications for XML based message exchange. It uses different transport protocols i.e http, smtp. Standard protocol HTTP makes it easier for SOAP model to tunnel across firewalls and proxies without any modifications to SOAP protocol.

REST (Representational state transfer)-describes a set of architectural principles by which data can be transmitted over a standardized interface (HTTP).

**Comparisons**

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| **CORBA** | **Web services** |
| Uses non-standard protocol (inter internet object protocol) in sending of message. | Uses HTTP protocol for sending and receiving messages between applications |
| Are true object oriented component architecture. | Are primarily message based |
| Components are defined using corba interface description language | Data encoding in web services is based on XML. |
| Components are discovered using the corba registry | Are discovered using UDDI( Universal Description Discovery and integration) |
| It uses IIOP protocol which non-internet friendly. | Are firewalls friendly |
| Preffered in building enterprise applications that runs on the same platform and not good enough for applications that span platforms and languages. | It supports inter-operability i.e cross platform integration is possible |

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| **Statefull Protocol** | **Stateless Protocol** |
| It expects a response ,track information and the resend the request if no response is recieved | Sends request to the server and relays the response back without storing any information |
| The current transaction can be affected by the previous ones. | Transaction can’t be affected by previous ones. |
| Since it depends on server capable of storing data,due to complexity in management of the data. Administrators have to ensure proper back up storage is used. | Data is not transcient hence it’s not must to be stored permanently on the servers. Bulk of storing data lies on the client. |
| Stateful protocols runs on more computer brain power and storage requirements. Since they are logically heavy and more challenging to implement. | Are easier to implement since they require lesser computer processing power. |
| Entails higher level of interdependence between server side and the clients. Requests send to the server must be responded to before users can establish a connection. | There is lesser dependency level between clients and servers. Since request are independently responded at, without basing the response on stored data which is not there. |
| Servers requires a highly complex design and heavy design since it’s retain the bulkiness of responsibility to server while freezing clients device. | Server complexity is lesser since its architecture design protocol is easy. |
| In Scaling up in a stateful architecture, one must manually include additional stateful services and servers to the existing services. The same applies to scaling down a service. | Ease of scalability since its service architecture in scaling up or down can be done automatically for cloud based apps using an auto-scaler tool. |

**4. Diffrentiate between stateful and stateless protocols**

**Stateless Advantages**

* Stateless protocols can bounce back rapidly in the event of system malfunction as no state is maintained or needs to be preserved.
* It minimizes the number of resources, including storage, that would be otherwise needed to maintain transactions.
* Stateless architecture can be easily scaled up or down, as the case may be while retaining functionality.

**Stateless disadvantages**

* Network performance may reduce because of the large amount of data sent out repetitively.
* Stateless architecture is less capable of carrying out some functions due to a lack of information storage.

**Stateful advantages**

* The stateful protocol can deliver better performance because it stores information that helps future transactions.
* Stateful architecture has an excellent extra security layer, making it very popular in the banking and finance sector for online transactions.
* Stateful protocols are intuitive due to their ‘memory.’

Stateful protocols are a type of communication protocol that keeps track of the state of a connection between two devices, allowing for a more efficient, intuitive, and reliable connection between the two. The data stored in the stateful protocol helps it understand the current state of the connection, as well as the quality of service and reliability of data transfer. This stateful protocol ‘remembers’ all the previous connections, allowing for faster communication and a more efficient overall connection. Moreover, due to its ability to ‘remember’ the previous connections, the stateful protocol is intuitive and user-friendly, making it easier for users to navigate and utilize the protocol.

**Stateful disadvantages**

* Memory must be included as part of the server architecture for data storage.
* The server bears a considerable burden on the functionality of the entire application, so stateful applications need an intricate server.
* Performance is partly dependent on the efficiency of the network memory. This means continuous management throughout the time the service is being offered.

**5. Explain how stateless service works**

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