

Assignment 3 UNIT - 2

Ques: 3) What are designing issues of application layer and presentation layer.

Ans -

Application Layer -

It's highest level layer in OSI model it intersect with software application eg - of application layer the email, remote login, file transfer & browser application

* presentation Layer -

- It handle data compression and data decompression this layer also known as syntax layer.
- This layer is responsible than formatting of data according to user or application requirement.

* issues of presentation Layer -

- 1) Standard way of encoding data -
The presentation layer follows a standard way to encode data when it needs to be transmitted. This encoded data is represented as character string, integer, floating point number and data structure composed of simple component. It is handled differently by different machines based on the encoding method followed by them.

2) maintaining the syntax and semantics of distributed information.-

The presentation layer manages and maintains the syntax as well as logic and meaning of the information that is distributed.

3) standard encoding on the wire -
The data structures that are defined to be exchanged need to be abstract along with the standard encoding to be on the wire.

Ques 2) What are data compression techniques at presentation layer?

Ans - At the presentation layer of the OSI model, data compression techniques are used to reduce the size of data before transmission over the network.

The following are some commonly used data compression techniques at the presentation layer.

Huffman coding -

This technique compresses data by assigning variable-length codes to different characters based on their frequency of occurrence in the data. Characters that occur more frequently are assigned shorter codes, resulting in more efficient compression.

2) Lempel - Ziv - compression -

This technique is based on identifying repetitive pattern in the data and replacing them with shorter codes. This results in significant compression of the data.

3) Run-length encoding -

This technique is used to compress data by identifying runs of the same data and replacing them with a count of the number of occurrences.

4) Arithmetic coding -

This technique is used to encode data by assigning fractional values to each character based on its probability of occurrence. The data is then compressed by representing the entire sequence of characters as a single fractional value.

5) Burrows - Wheeler Transform -

This technique is used to compress data by recording the characters in the data to maximize the number of repeated pattern, the recorded data is then compressed using other technique such as Huffman coding or arithmetic coding.

Ques 3)

Explain working of RPC?

Ans -

RPC (Remote procedure call) is protocol used for communication between different process running on different system or machine. RPC allows a program to call a procedure or function on a remote machine as if were a local function call.

The working of RPC involves the following:

- ① Client Sends a request - the client sends a request to the server to execute a specific function or procedure. The request includes the name of the function to be executed and any parameters required.
- ② Marshalling - the client request is then converted into a language-independent format (usually binary or text) that can be transmitted over the network.
- ③ Network transmission - the marshalled request is transmitted over network to the Server.
- ④ Unmarshalling - the Server receives the request and unmarshals it,

converting it back into a format that can be understood by the server's programming language.

⑤ server executes the procedure -

The server then execute the specified function or procedure, using the parameters provided in the request.

⑥ marshalling of response -

the server response, which include any return value or error, is marshalled into a language-independent format.

⑦ Network transmission of response -

The marshalled response is then transmitted back to the client over the network.

⑧ unmarshalling of response -

The client receive the response and unmarshals it, converting it back into a format that can be understood by the client's programming language.

⑨ client receives response -

The client receives the response from the server and processes it as appropriate.

Ques 4) Explain working of Transport Layer and write a note on its designing issues.

Ans - The Transport layer is responsible for providing reliable end-to-end communication between two hosts in a network. It is fourth layer in OSI (Open System Interconnection) model, and its main function is to ensure that data is transmitted between the sender and receiver in an orderly, efficient and error-free manner.

The Transport layer performs two main functions.

① Segmenting the Data -

The Transport layer divides the data into smaller segments and assign a sequence number to each segment. This ensures that large amounts of data can be transmitted over the network without overwhelming the network resources.

② Providing Reliable Delivery -

The Transport layer provides reliable delivery of data by implementing mechanisms such as error detection and correction, flow control and congestion control. These mechanisms ensure that data is transmitted correctly, without error or loss, and that the network resources are utilized efficiently.

* Designing issues in the transport layer
The design of the transport layer is crucial for the efficient and reliable functioning of the network. Some of the key issues that need to be addressed in the design of the transport layer.

① Reliability -

One of the primary objective of the transport layer is to ensure the reliable delivery of data. The design must take into account the various mechanisms that are needed to achieve this objective, such as error detection and correction, flow control, congestion control.

② Efficiency -

The transport layer must be designed to make efficient use of network resources, such as bandwidth and processing power. This requires careful consideration of issues such as packet size, segment size, and the number of packets that can be sent at a given time.

③ Scalability -

The transport layer must be designed to support the needs of a wide range of applications and network topologies. This requires the design

- to be scalable, flexible and adaptable
- to changing network conditions.

④ Security -

The transport layer must be designed to provide secure communication between hosts, ensuring that data is not intercepted, modified, or stolen by unauthorized parties.

The transport layer plays a critical role in the efficient and reliable functioning of computer networks. Its design must take into account a range of issues, including reliability, efficiency, scalability, and security, to ensure that it meets the needs of modern networks and applications.