1. Inspite of its conceptual elegance, RPC (Remote Procedure Call) have a few problems. Discuss any 3 of those in brief.

Remote Procedure Call (RPC) has problems or issues that need to be dealt with. They are (“Remote Procedure Call”,n.d.):

1. Binding - the client needs to know what the services names are and on which server they reside.
2. Marshalling - any parameters that are passed to the server by the client need to be standardized so that the server can correctly use the parameters.
3. Semantics - since the client and server do not share an address space, call-by-reference is not possible.
4. Why is timestamping needed in Real Time Applications? (This is in context to RTP)

Real Time Applications (RTP) need timestamping in order to deal with bursts of data (Kraft, 2009). When data rates are so high that the receiver process the data, data packets may be dropped. If data packets have timestamps, then packets which timeout, due to having been dropped, can be resent. This helps to ensure the reliability of data.

1. Why does the maximum packet lifetime , T, have to be large enough to ensure that not only the packet but also its acknowledgements have disappeared?

It is not enough to have the maximum packet life, T, be large enough to ensure the packet has arrived. It needs to be large enough to ensure that its acknowledgement also has gotten back. This ensures that duplicate packets will not be sent to the receiver. If the acknowledgement is not received in time, then the sender will resent the data packet with data that may have already made it to the receiver (Gupta, n.d.).

1. Give one potential disadvantage when Nagle's algorithm is used on a badly congested network.

Nagle’s algorithm was devised to control congestion by slowing the sending of packets to a receiver before an acknowledgement (ACK) is received. However, this strategy fails when the receiver is using TCP Delayed Acknowledgement, which attempts to reduce congestion by sending ACKs bundled together. A stalemate situation occurs because delays will cause the host to delay sending the ACK, which in turn causes the sender to buffer more data packets until the ACK is received (“The Problem with Nagle’s Algorithm”, 2013).

1. Why does UDP exist? Would it not have been enough to just let user processess send raw IP packets?

Raw IP packets do not include ports, but UDP includes both source and destination port information. This means that a raw IP packet cannot be delivered to a specific application, but UDP ensures that a packet will be delivered correctly. (Park, 2004).

References

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