Shiraz Bangash

ID14539

Q1(A)

The seven layers refers to the open Systems Interconnection (OSI) model. a conceptual framwork the describe the function at a networking or telecommunication system. The model uses layers to help avisual description at what is going on with a particular networking system. This can help network manager narrow down the problem (is it a physical issue or something with the application) as well as computer programing (when developing an application, which other layer does it work with). Tech vendors selling new products will often refer to the OSI model to help customers understand which layer there product work with.

Q1(b)

Advantages

The primary advantage is less queueing when packets are transmitted and received they are placed in receive and transmit queues at different levels as they are passed along the layers. This introduce additional latency and uses more memory. This can contribute to Buffer Bloat. When more layer are combined in one the exchange of data between each layer is controlled by application author, and thus its easier to tune it. Single layer to study as all the functionalities is provided at this layer. Higher Bandwidth as number of layer is reduced.

Disadvantage

less reusability, Harder for others application to use the same code for the session and/or presentation layer for example Harder to maintain; without clear separation combining different layers functionality can lead to code overly tied together and too complex and thus harder to maintain. There will be security issues as the network security and Application Security will open at a single point which may expose our network open to threat.

Q2(A)

The seven-layer at OSI/ISO models are given (7) Application (6) Presentation (5) session (4) Transport (3) Network (2) Data link (1) physical.

(1) Physical layer:- The physical layer is the first layer at OSI model and convay the bit stream at electrical impulse, radio singnals light signals via network at the mechanical or electrical level. This layer also provids hardware means at sending and receiving the data on a way ar a carrier thus includes the difinition at cables cards and physical aspects

(2) Data link layer:- This layer is 2nd layer in OSI model. In this layer data packets are both encoded and decoded into bits. This layer is divided into two sub layers first media Access control (MAC) and logical link control (LLC)

(3) Network layer:- This layer provides routing and switching technologies creat logical paths called as virtual circuits for transmitting the data from one node to anather node.

Session layer

(4) Transport layer:
This layer coordinates data transfer between system and host including error checking and data recovery

(5) Session layer
This layer establishes and terminates connection between devices it also determins which packets belong to which text and images files

6 Presentation layer:
This layer converst data to and from the Application layer. it translate application formatting to network formatting and vice versa.

(7) Application layer
Most at what the user actually interacts with is at this layer ~~ebewb~~ browsers and other internet-connected Application.

Q2(b)

A sine wave is offset 1/6 cycle with respect to time o what is its phase in degrees and ~~rad~~ radians. we know that 1 complete cycle is 360. There fore, 1/6 cycle is $\frac{1}{6} \times 360 = 60° \times \frac{2\pi}{360}$ rad $= \frac{\pi}{3}$ rad $=$ 1.046 rad

A complete sine wave in the time domain can be represented by one single spike in the frequency domain. The frequency domain is more compact and useful when we are dealing with more then one sine wave three sin wave each with different amplitude and frequency. All can be represented by three spikes in the frequency domain.

Q3(A)

The duration at 1 bit before multiplexing is 1/1 Kbps or 0.001s (1ms). The rate at the link is 4 times the rate at at a connection. The duration at each time slote is one-fourth at the duration at each bit before multiplexing, or 1/4 ms or 250 μs. The data rate at the link, The bit duration is the inverse at the data rate or 250 μs. The duration at a fram is always the same as the duration at a unit before multiplexing or 1ms.

Q3(b)

(a) Given that

$N = 10,000$

$n = 1000$

$k = 16$

In the first stage we have N/N $10,000/1000 = 16$ crossbare each at size is ~~16~~ 16×16

In the second stage we have 16 crossbares each at size is 10×10

In the third stage we have 10,00 crossbars each at the size is 16×1000