

Why protocols & standards are needed

Standards and protocols provides the essential rules that enable hardware and software to work together in order to allow devices to communicate over a computer network.

Most common protocol that is widely used to make communication between devices is TCP/IP.

How are OSI and ISO related to each other.

OSI model (open system interconnection) model was proposed by ISO (international standards organization) in 1984.

ISO is multinational organization that tries to standardize network communication protocols at the international level and proposed OSI model to represent communication.

Change the following IPv4 addresses from dotted decimal notation to binary notation.

111.56.45.78

1101111.0011000.0010101.0100110

Procedure

2 | 111

2 | 55-1

2 | 27-1

2 | 13-1

2 | 6-1

2 | 3-0

1 | 1-1

2 | 56 2 | 45 2 | 78

What geometric shape is used in cellular system design?

Hexagonal cell shape is used in cellular system design

Hexagonal cell shape is perfect over square or triangular cell shapes in cellular architecture because it covers an entire area without overlapping i.e. they can cover the entire geographical region without any gaps.

Write three limitations of cross-bar switch?

Following are three limitations of cross-bar switch.

The number of crosspoints grows with the square of the number of attached stations. This is costly for a large switch.

The loss of cross point prevents connection b/w the two devices whose lines intersect at the cross point.

The crosspoints are insufficiently utilized, even when all devices are active, only a small fraction of the crosspoints are engaged.

Packets of 512 bytes are being sent over a 64-Kbps channel. How much time will it take to send 500 packets?

Size of 1 packet = 512 bytes
Channel speed = 64 Kbps = 64000 bytes/s
Time to send 500 packets = ?

Time taken by channel to send 1 packet = $\frac{512 \text{ b}}{64000 \text{ b/s}}$

$$= 0.008 \text{ s}$$

Time to send 500 packets = 0.008×500
= 4 sec

(viii) You have two computers connected by an Ethernet hub at home. Is this a LAN, WAN or MAN? Explain with reason.

Two computers connected by same Ethernet. Ethernet is used in LAN and has a limit to the length of cable used. Wireless networking is also considered in LAN.

All the requirements are fulfilled by LAN so it can be considered LAN.

Give reasons (viii) of using fragmentation and reassembly.

Reasons:

- (i) The communications network may only accept blocks of

data up for a certain size.
(2) Error control can be more efficient with a smaller PDU size. With smaller PDUs, fewer bits need to be retransmitted when a PDU suffers an error.

(ix)

What is subnetting & super netting?

Subnetting is the practise of dividing a network two or more smaller networks.

It increases routing efficiency, enhances the security of the network & reduce the time size of the broadcast domain.

Supernetting is the opposite of subnetting. In this, multiple networks are combined

into a bigger network termed as Supernetwork or super netting.

(i) It is used mainly in Route Summarization, where routes to multiple networks with similar network Prefixes are combined into a single routing entry, with the routing entry pointing to a Super network, encompassing all the networks.

(ii)

What is a Least - Cost algo?

LCR is an algo that attempts to route each phone call using the lowest cost provider out of a predefined vendor pool.

Generally, "in-switch" routing has been setup to handle Least Cost Routing.

It is basically a pricing strategy used by telecommunication providers.

(ii) Distinguish b/w TCP, UDP & DCCP.

TCP:

- It is connection-oriented protocol.
- TCP treats data as stream of bytes, and the message is transmitted to segmented boundaries.
- TCP is more reliable. It transfers data from device to web-server. The sender can now send data in the form packet. If packet is lost or sent in wrong order, receiver asks to resend it.

UDP:

- It is a connectionless protocol.
- UDP messages contains packets that were sent 1 by 1.
- It also checks for integrity at the arrival time.
- It is used in streaming.

DCCP:

" Datagram Congestion Control Protocol.
is a message-oriented transport
layer protocol.

" DCCP implements reliable connection
set-up, teardown, Explicit Congestion
Notification (ECN), congestion control
and feature negotiation.

(xii)

Assume six devices are arranged
in a mesh topology. How many
cables are needed?

How many ports are
needed for each device?

n: no. of devices arranged.

$$\therefore n * (n-1) / 2$$

$$6 * (6-1) / 2$$

$$6 * (5) / 2$$

$$= 15 \text{ cables.}$$

for Port..

$$= N-1$$

$$= 6-1$$

$$= 5$$

hence total number of
ports required by
each device is 4.