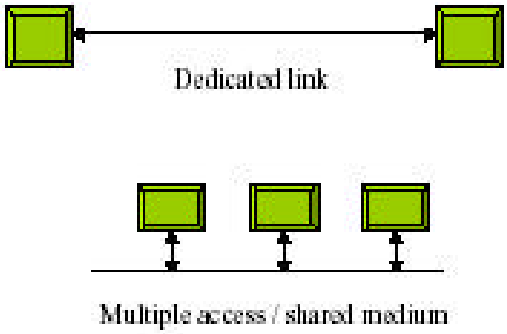
1

Dedicated versus multiple access:



Dedicated link there is no sharing of the bandwidth.

Flow Control and Congestion Control

Flow Control – Ensures sender does not swamp the receiver
Congestion Control – Ensures sender does not swamp the network

ADSL

A – Asymmetric
Download speed greater than Upload speed

Layering

Advantages – Modularity
Ability to mix and Match layers

Disadvantages - Duplication of Effort
Overhead

(YYY) XXX-XXXX

Why the company switched: Too many numbers – became difficult to manage. Also the amount of wires needed to connect all of them would be n*(n-1), where n is the number of phones.

Disadvantage of hierarchy – The database in the switches is very large as it has to remember a lot of numbers and which numbers need to be switched where. This can be statically built into the chip, but then scalability will become a problem.

The biggest advantage of hierarchical addressing is scalability

2 Fill in the blanks

The components of a data network are **routers (switches, hubs, backbones), links (cables, wires) and hosts (clients, servers).**

Network Latency consists of propagation delay, transmission time, and service time.

The number of times an analog signal is sampled in a given time period is called **sampling frequency or sampling rate.**

Digitization is the process by which **Analog** signals are converted to **Digital** signals.

3 Problems

a
Type I – Sampling period 1/8000 seconds. Sample – 16 bits long.

Sampling period refers to time => Frequency = 1/1/8000 = 8000 Hz.

Bit rate = F * b = 8000 * 16 = 128000 bps
= **128 kbps.***

Type II - Sampling period 1/10000 seconds. Sample – 10 bits long.

Sampling period refers to time => Frequency = 1/1/10000 = 10000 Hz.

Bit rate = F * b = 10000 * 10 = 100000 bps
= **100 kbps.***

I have accepted both 1 kb = 1000 bits and 1kb = 1024 bits.

b Parity:

The sender adds the parity bit and the receiver performs the error detection.

Even Parity:
The sender before transmitting counts the number of ones. If the number of “1” bits are even, the parity bit is “0”, else “1”.
The receiver upon receiving the data, counts the number of “1” bits, including the parity bit. If the count is odd an error occurred, else no error according to parity.

Example:
Sender:
Transmitted Data – 1010
With Parity – 1010 0

Receiver:
Received Data: 1010 0 – no error
Received Data: 1000 0 – error
Received Data: 0000 0 – no error according to parity

Odd Parity:
The sender before transmitting counts the number of ones. If the number of “1” bits are odd, the parity bit is “0”, else “1”.
The receiver upon receiving the data, counts the number of “1” bits, including the parity bit. If the count is even an error occurred, else no error according to parity.

Example:
Sender:
Transmitted Data – 1010
With Parity – 1010 1

Receiver:
Received Data: 1010 1 – no error
Received Data: 1000 1 – error
Received Data: 0000 1 – no error according to parity

From the examples one can see that parity can only detect odd number of bit changes.

Quiz 1 Analysis:

1. There was no grading curve. You got points according to what you answered. It was graded for a total of 70.

2. The most common mistakes
    a) Parity
    b) Fill in the blanks on sampling frequency.
    c) Hierarchical addressing
    d) Layering
    e) Flow and Congestion Control

3. Quiz Average: 50.5 Max: 69 Min: 23 S.D: 10.574