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25/4/2020 Computer Network (BCA135A)

Section-4

A. • ALOHA
• Carrier Sense
• Inhibit Sense
• Collision Resolution – 1. Stack algorithm
2. Tree algorithm

• The ALOHA Protocol – 1. first realization used radio links to connect terminals on islands with main computer. If packet is recieved correctly the base station transmits an acknowledgement.

• Unslotted ALOHA : transmission may start anytime
• Slotted ALOHA : packets are transmitted in time slots.

• Carrier Sense – No new packet transmission is initiated when the channel is busy. Reduces collisions.
• CSMA is usefull if channel sensing is much faster than packet transmission time.
• Hidden Terminal Problem:

mobile terminal may not be aware of transmission by another terminal.

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RCM PAGE NO.: DATE: / /

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Decision problem: how to distinguish noise and weak transmission?

Solution: Inhibit Sense Multiple Access (ISMA)

- Inhibit Sense — BTMA — Busy Tone Multiple Access.

If busy, base station transmits a "busy" signal to inhibit all other mobile terminals from transmitting collisions still occur because of
- signalling delay
- persistent terminals

B. In Computer Networking, Internet Protocol Control Protocol (IPCP) is a Network Control Protocol for establishing and configuring Internet protocol over a Point-to-Point protocol link.
Each of two endpoints of a PPP connection must send an IPCP configure request to its peer because the TCP/IP options are independent for each direction of a PPP connection.

IP Frame: After configuration is done, the link is able to carry IP data as a payload of PPP frame.

PPP header	IPCP header	Data :::

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Code
8 bits
Specifies the function to be performed.

Identifier, 8 bits
Used to match requests & replies.

Length 16 bits
Size of the packet including the header.

Data Variable length
Zero or more bytes of data as indicated by the length.

IP — Address

Type	Length	IP address
1 byte	1 byte	4 bytes

Common Internet protocols include:
- TCP/IP (Transmission Control Protocol / Internet Protocol).
- UDP/IP (User Datagram Protocol / Internet protocol)
- HTTP (Hyper Text Transfer Protocol)
- FTP (File Transfer Protocol)

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- TCP/IP – is a stream protocol. This means that a connection is negotiated between a client and server. Since the TCP protocol can only connect two endpoints, it is also called peer-to-peer protocol.
- HTTP – is the protocol used to transmit all data present on world wide web.
- FTP – is the protocol used to transmit files between computers connected to each other by a TCP/IP network, such as the Internet.

Section-3

A. 1- Persistent – • waiting terminal may start transmitting as soon as previous transmission is terminated.
• Short delays, but more severe stability problems

CSMA Algorithm:

Terminal Behavior

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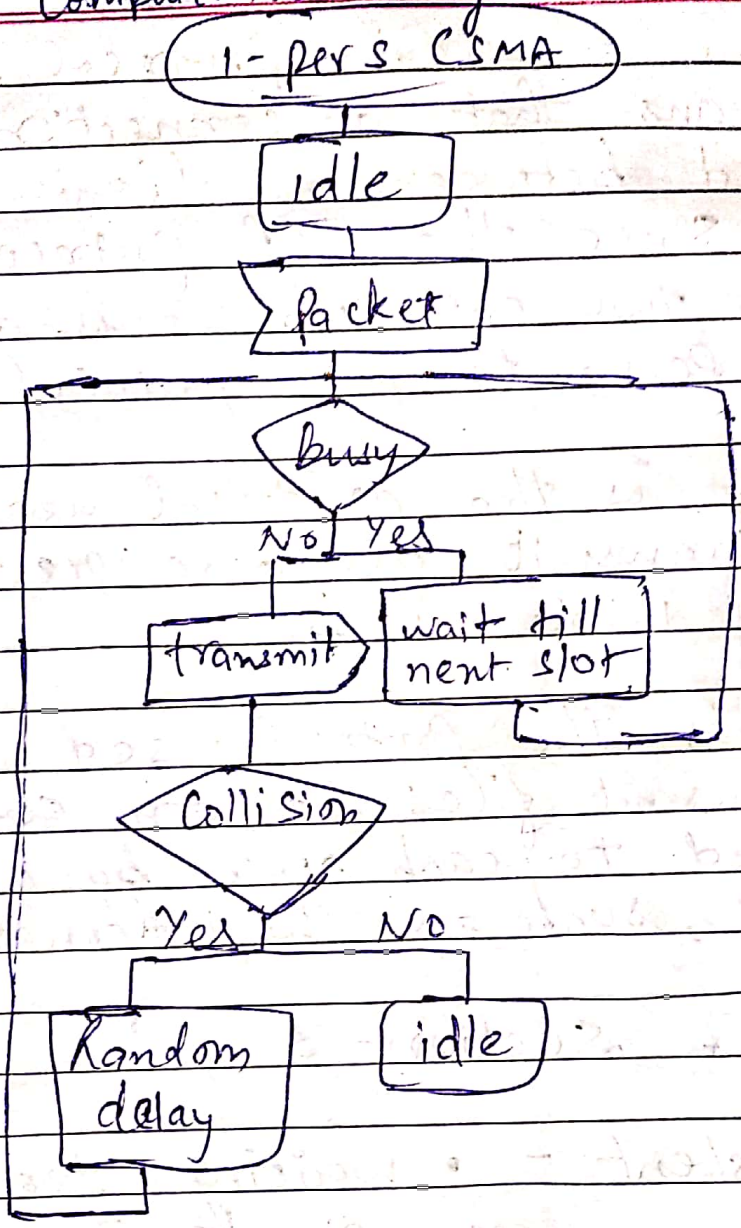

p- persistent - • The channel has mini-slots, much shorter than packet duration.
• Transmission attempt takes place with probability p.

CSMA Algorithm:

Terminal Behaviour.

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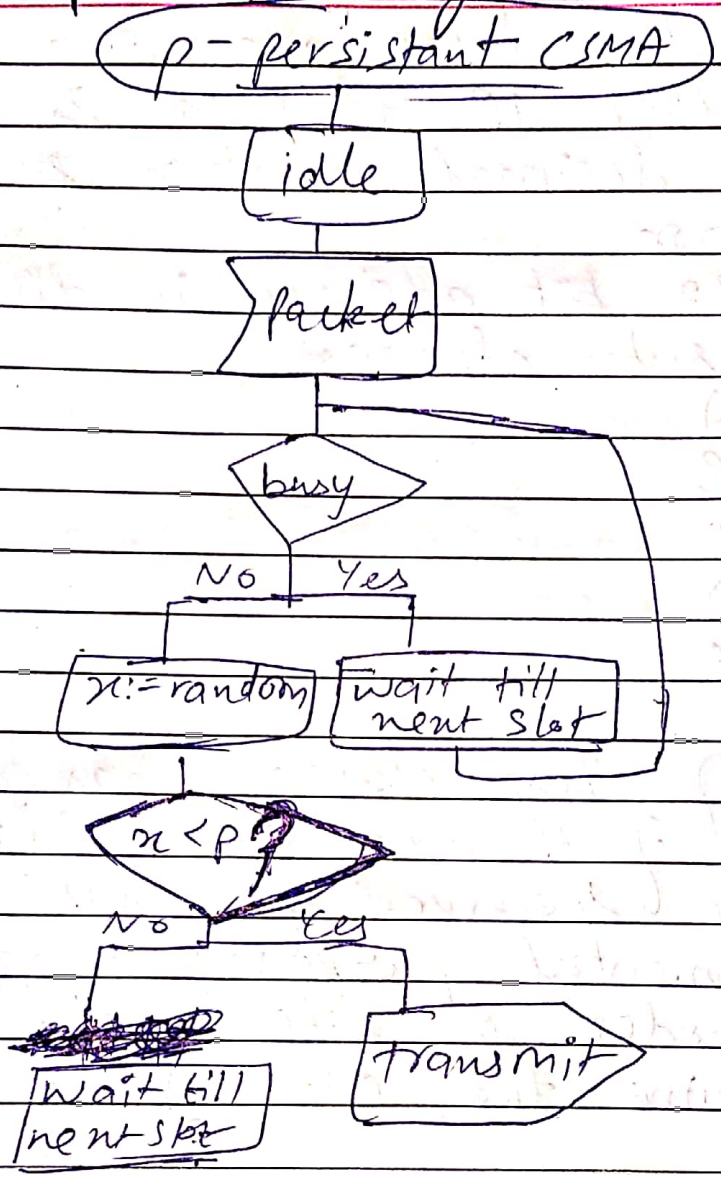

Non-persistent - • Random waiting time after sensing the channel busy.

• High throughput, but long delays.

B- IP address is an address having information about how to reach a specific host, especially outside the LAN. An IP address is a 32 bit unique address having an address space of 2^{32}.

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Generally, there are two notations in which IP address is written, dotted decimal notation & hexadecimal notation.

The 32 bit address is divided into five sub-classes:

1. Class A
2. Class B
3. class C
4. Class D
5. Class E

Each of these classes has a valid range of IP addresses. Classes D and E are reserved for multicast and experimental purposes respectively. The order of bits in the first octet determine the classes of IP address.

IPV4 address is divided into two parts:

- Network ID
- Host ID

Class	leading Bits	Net ID Bits	Host ID Bits	No. of Networks	Addr. per Network	Start Address	End Address
Class A	0	8	24	2^7 (128)	2^{24} (16,777,216)	0.0.0.0	127.255.255.255

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ClassB	10	16	16	2^{14} (16,384)	2^{16} (65,536)	128.0.0.0	191. 255.255. 255.
ClassC	110	24	8	2^{21} (2,097,152)	2^{8} (256)	192.0.0.0	223. 255.255. 255.
ClassD	1110	Not D.	Not D.	Not D.	Not D.	224.0.0.0	239.255.255. 255
ClassE	1111	Not D.	Not D.	Not D.	Not D.	240.0.0.0	255.255. 255.255

Section - 1

Q1. (b.) Both a and d

Q2. (b.) two times

Q3. (b.) Bridge

Q4. (b.) 18.4

Q5. (a.) non-persistent

Q6. (c.) network address & host address

Q7. (a.) unicasting

Q8. (b.) 255.255.255.128

Q9. (b.) ARP

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Q10. (A) C

Section-2

A. Repeaters - are devices that regenerates the signal and retransmit them to destination.

Hub - is device that recieves requests or information and sends it to several connected nodes in a broadcast mode.

Switch - is a intelligent hub device that sends data to ~~the~~ intended node(s).

Router - is a device that gives route to signals to reach end data.

B. IP address is a unique identity address ~~device~~ that is associated with a specific computer or computer network.

Two types of IP address:

- Public - used by routers & by computers connected directly to DSL modems without a router.

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- private – are special IP addresses that are known only to a router and its home network.

C. Token ring is a computer networking technology used to build local area networks. It uses a special three-byte frame called a token that travels around a logical ring of workstations or servers.

D. • Requires no network information like topology, load condition
- Every incoming packet to a node is sent out on every outgoing like except one it arrived on.

Advantages:

- Highly Robust, emergency or immediate messages can be sent.
- Set up route in virtual circuit.