

\*\*\*\*Va rog, atunci cand sunteti pe document mai verificati si voi intrebarile sa ne asiguram ca sunt corecte, chiar daca sunt cu rosu \*\*\*\*

\*\*\*\* Cateva apar nesigure, get asa ca le puteti pune cu rosu daca credeti si voi ca ala e raspunsul \*\*\*\*, putin purrr pu rrrriu nu strica niciodata, sa savuram culoarea din timp

**GRILE RC - am decis sa schimb culoarea titlului in Ametist pentru noroc**

#10laRC (scris cu baby blue)

Doamne ajuta! (scris cu somon) Asa sa fie

**1.Care dintre urmatoarele tehnici de rutare este cea mai complexa?**

**Which of the following routing techniques presents more complexity?**

- a. Rutare fixa (Fixed routing)
- b. **Rutare adaptiva (Adaptive routing)**, cred dar verificati
- c. Rutare prin inundare (Flooding routing)
- d. Toate variante

**Pe NET:** The types of Non **Adaptive routing** algorithm are **flooding** and random walks. **Adaptive Routing** algorithms are **more complex**. Non-**Adaptive Routing** algorithms are simple.

**2. Ce adresa este folosită, de cate nivelul de transport, pentru a identifica un proces pe o masina?**

**Which address is used to identify a process on a host by the transport layer?**

- a. **Port (port address)**
- b. Adresa logica (logical address)
- c. Adresa fizica (physical address)
- d. Adresa specifica (specific address)

**Explanation:-** a port number is a way to identify a specific process to which an internet or other network message is to be forwarded when it arrives at a server. some examples of port numbers are port 20 which is used for ftp data, port 22 which is used for ssh remote login ,and port 23 which is used for telnet.

**3. Intr-o retea fara fir ad-hoc:**

**In wireless ad-hoc network:**

- a. nodurile nu sunt necesare
- b. punctul de acces este obligatoriu
- c. toate nodurile sunt puncte de acces
- d. **punctul de acces nu este necesar**

**Explanation:** An **ad-hoc wireless network** is a decentralized kind of a **wireless network**. An access point is usually a central device and it would go against the rules of the **ad-hoc network** to use one. Hence it is **not required**.

**4. Care dintre urmatoarele afirmatii este falsa in ceea ce priveste TCP?**

- a. orientat pe conexiune (connection oriented) E ADEVARAT
- b. **incredere scazuta (unreliable)** FALS
- c. protocol de nivel de transport (transport layer protocol) ADEVARAT
- d. procesare ridicata (high overhead)

But while TCP is instinctively reliable, its feedback mechanisms also result in a larger overhead.

**Explanation:** TCP is a transport layer protocol that provides reliable and ordered delivery of a stream of bytes between hosts communicating via an IP network.

**5. Standardul POP (Post Office Protocol) are rolul de a:**

- a. **permite unui client e-mail sa descarce un e-mail de pe un server de e-mail**
- b. adauga capacitati multimedia protocolului SMTP
- c. permite unui client e-mail sa translateze numele serverului de e-mail intr-o adresa de IP
- d. toate variantele

**6. Care afirmatie este adevarata referitor la standardul MIME:**

- a. adauga capacitati de rutare IPv6 protocolului SMTP
- b. **adauga capacitati multimedia protocolului SMTP**
- c. toate variantele
- d. adauga capacitati de transmisie a mesajelor text protocolului SMTP

**7. Care parte din URL-ul <http://www.example.com/index.html> reprezinta un domeniu DNS de tip TLD?**

- a. www
- b. **com**
- c. index
- d. http

**8. Care este protocolul de nivel de aplicatie care utilizeaza mesajele GET, PUT si POST?**

- a. POP3
- b. **HTTP**
- c. DNS
- d. DHCP

**9. Care este principalul dezavantaj al metodei de control al fluxului Stop-and-Wait?**

- a. incredere scazuta
- b. **ineficient**
- c. atenuare
- d. pachete pierdute (dropped packets)

**10. Controlul fluxului este in principal o functie din care nivel ISO/OSI?**

Flow control is mainly function of which ISO/OSI layer?

- a. **legatura de date (data link)**
- b. aplicatie (application)

- c. sesiune (session)
- d. fizic (physical)

pe net zice de Transport Layer, buut nu vad a fi o varianta, asa ca am ales data link

<https://www.geeksforgeeks.org/working-of-iso-osi-model/>

The **data link layer** is further divided into two sublayers: The **Logical Link Control (LLC)** sublayer is responsible for flow controls and error controls that ensure error-free and accurate data transmission between the network nodes.

**11. In metoda Stop-and-Wait a controlului fluxului, expeditorul trimite cate cadre la un moment dat?**

**In the Stop-and-Wait method of flow control, the sender sends how many frames at a time?**

- a. doua cadre
- b. un numar variabil de cadre
- c. un anumit numar de cadre
- d. doar un cadru, am vazut asta intr-un alt test, link-ul 2

**12. Un transmitator are o fereastră glisanta de dimensiunea 15. Primele 15 cadre sunt trimise. Primul ACK primit este ACK 15. Ce cadru/cadre a acceptat receptorul?**

- a. nici un cadru
- b. cadrele 0 pana la 14
- c. cadrul 15
- d. cadrul 14

**13. In TCP, trimiterea si primirea datelor se face ca:**

- a. secventa de caractere
- b. linii de date (lines of data)
- c. flux de octeti (stream of bytes)
- d. pachete (packets)

TCP provides stream oriented delivery between hosts communicating via an IP network and there are no message boundaries. TCP can concatenate data from a number of send () commands into one stream of data and still transmit it reliably.

**14. TCP grupeaza un numar de octeti impreuna intr-un pachet numit:**

- a. zona tampon (buffer)
- b. segment (segment)
- c. stiva (stack)
- d. pachet (packet)

A segment may be collection of data from many send () statements. TCP transmits each segment as a stream of bytes.

**15. In metoda ferestrei glisante de control al fluxului, la primirea cadrelor dimensiunea ferestrei receptorului:**

**In the sliding window method of flow control when frames are received the receiver's window size:**

- a. descreste
- b. ramane la fel
- c. creste
- d. se dubleaza

**16. Care este principalul avantaj al UDP?**

- a. protocol de nivel de aplicatie (application layer protocol)
- b. procesare scazuta (low overhead)
- c. toate variantele
- d. procesare ridicata (high overhead)

**Explanation:** As **UDP** does not provide assurance of delivery of packet, reliability and other services, the overhead taken to provide these services is reduced in **UDP's** operation. Thus, **UDP** provides low overhead, and higher speed.

**17. HDLC este:**

- a. un protocol standardizat de control al aplicatiei
- b. un protocol de control al transportului standardizat
- c. un protocol standardizat de control al legaturilor de date
- d. un protocol standardizat de control al retelei

**18. Care dintre urmatoarele tehnici de rutare nu necesita informatii despre retea?**

- a. rutare adaptiva
- b. rutare fixa
- c. toate variantele
- d. rutare prin inundare(din curs)

**19. Care tehnica de multiplexare transmite semnale digitale?**

- a. FDM
- b. TDM
- c. WDM
- d. nici o varianta nu este corecta

**Explanation:** Time Division Multiplexing is used to transmit digital signals. FDM and WDM techniques are used to transfer analog signals.

**20. Adresarea IPv6 anycast este:**

- a. adresare 1 la 1
- b. adresare 1 la toti
- c. adresare 1 la cel mai apropiat
- d. nici o varianta

**In curs:** Delivered to any one interface, usual the “nearest”

**21. Tipuri de adresare IPv4 care permite comunicare cu un grup de dispozitive este:**

- a. **adresare multicast** asta? sa puna cineva cu rosu pls daca mai e de acord cu mn
- b. adresare broadcast
- c. adresare anycast
- d. adresare unicast

**22. Care dintre urmatoarele tehnici de rutare foloseste o ruta permanenta intre fiecare pereche de noduri sursa-destinatie?**

- a. rutare prin inundare
- b. **rutare fixa**
- c. rutare adaptiva
- d. toate variantele

**23. Ce camp este folosit pentru a detecta erori pe intreaga datagrama a utilizatorului:**

- a. UDP header
- b. destination port
- c. **checksum**
- d. source port

**24. Care dintre eveniment nu este posibil in LAN wireless?**

- a. confirmarea cadrelor de date
- b. transmisie multimod de date
- c. **detectarea coliziunii**
- d. conexiune la retele cu fir

**Explanation:** Collision detection is **not possible** in **wireless LAN** with **no** extensions. Collision detection techniques for multiple access like CSMA/CD are used to detect collisions in **Wireless LANs**.

**25. Ce tehnica de acces multiplu este utilizata de standardul IEEE 802.11 pentru LAN wireless?**

- a. CDMA
- b. ALOHA
- c. **CSMA/CA**
- d. CSMA/CD

**Explanation:** CSMA/CA stands for Carrier-sense **multiple access**/collision avoidance. It is a **multiple access protocol used by IEEE 802.11 standard for wireless LAN**.

**26. Ce tehnica de multiplexare foloseste fasciculele de lumina?**

Which multiplexing technique uses light beams?

- a. FDM
- b. nici o varianta
- c. **WDM**

d. TDM

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----- INTREBARI PENTRU INTELECTUALI -----

1. The data link control portion of most LAN protocols in use today is based on:
  - a. ANSI
  - b. FDDI
  - c. SDLC
  - d. HDLC
  
2. \_\_\_\_\_ signal is analog.
  - a. A baseband
  - b. A broadband
  - c. An Ethernet
  - d. None of the above
  
3. There are \_\_\_\_\_ types of HDLC frames
  - a. 1
  - b. 2
  - c. 3
  - d. 4
  
4. BSC uses \_\_\_\_\_ for flow control.
  - a. stop-and-wait ARQ
  - b. go-back-n ARQ
  - c. selective-reject ARQ
  - d. any of the above
  
5. When message data is mistaken for control data, this is called a lack of \_\_\_\_\_.
  - a. synchronization
  - b. data transparency
  - c. flow control
  - d. line discipline
  
6. BSC operates in the \_\_\_\_\_ mode.
  - a. simplex
  - b. half-duplex
  - c. full-duplex
  - d. duplex
  
7. What is the main disadvantage of stop-and-wait flow control?
  - a. unreliable
  - b. inefficient

- c. attenuation
  - d. dropped packets
8. \_\_\_\_\_ is the basis for all bit-oriented protocols in use today.
- a. SDLC
  - b. HDLC
  - c. PPP
  - d. LAP
9. If the first two bits of an HDLC control field both 1s, this signifies \_\_\_\_\_.
- a. an I-frame
  - b. an S-frame
  - c. a U-frame
  - d. an E-frame
10. Control information in a system using \_\_\_\_\_ protocol are characters from an existing character encoding system.
- a. an asynchronous
  - b. a character-oriented
  - c. a bit-oriented
  - d. b and c
11. AN HDLC \_\_\_\_\_ station sends both commands and responses.
- a. primary
  - b. secondary
  - c. combined
  - d. none of the above
12. HDLC inserts a redundant 0 bit after the \_\_\_\_\_ consecutive 1 bit in the message data.
- a. fifth
  - b. sixth
  - c. seventh
  - d. eighth
13. An HDLC \_\_\_\_\_ is used to transport user data and control information.
- a. I-frame
  - b. S-frame
  - c. U-framed.
  - d. A-frame
14. When primary station A sends an HDLC frame to secondary station B, the address field contains the \_\_\_\_\_
- a. physical address of station A
  - b. physical address of station B
  - c. logical address of station A
  - d. logical address of station B
15. Twisted-pair wire, coaxial cable, and fiber-optic cable are all types of \_\_\_\_\_.

- a. protocols
- b. messages
- c. media
- d. data

16. A sender using stop-and-wait ARQ sends data frames numbered \_\_\_\_\_.

- a. 0 and 1 only
- b. sequentially, beginning with 0
- c. sequentially, beginning with 1
- d. the frames are not numbered

17. Which error detection method involves polynomials?

- a. VRC
- b. LRC
- c. CRC
- d. checksum

18. FDM uses \_\_\_\_\_ to prevent modulated signals from overlapping.

- a. physical hardware devices
- b. carrier frequencies
- c. guard bands
- d. demultiplexers

19. In cyclic redundancy checking, the divisor is \_\_\_\_\_ the CRC.

- a. the same size as
- b. one bit less than
- c. one bit more than
- d. two bits more than

20. In BSC, an \_\_\_\_\_ means that a frame was accepted.

- a. ACK
- b. ACK0
- c. ACK1
- d. b and c

21. \_\_\_\_\_ signal is digital.

- a. A baseband
- b. A broadband
- c. An Ethernet
- d. none of the above

22. Selective reject ARQ is a \_\_\_\_\_ error control method.

- a. stop-and-wait ARQ
- b. sliding window ARQ
- c. go-back-n ARQ
- d. any of the above

23. The HDLC P/ F bit means poll when the frame is sent by a \_\_\_\_\_ station to a \_\_\_\_\_ station.

- a. secondary; primary
- b. primary; secondary
- c. secondary; combined



- d. secondary; secondary
- 24. The Ethernet access method \_\_\_\_\_.
  - a. involves a token
  - b. involves time registers
  - c. involves input and output queues
  - d. is CSMA/CD
- 25. A station on \_\_\_\_\_ network is identified by a unique 6-byte physical address.
  - a. an Ethernet
  - b. a Token Ring
  - c. an FDDI
  - d. all of the above
- 26. An Ethernet LAN uses \_\_\_\_\_ signals.
  - a. Manchester encoded
  - b. differential Manchester encoded
  - c. differential PSK
  - d. PSK
- 27. The collision domain of Ethernet is limited to \_\_\_\_\_ meters.
  - a. 2.5
  - b. 25
  - c. 250
  - d. 2500
- 28. The purpose of connecting each Token Ring station to an automatic switch is to \_\_\_\_\_.
  - a. multiplex frames
  - b. bypass an inactive station
  - c. prevent errors
  - d. increase the data rate
- 29. When a primary wants to receive data from a secondary, it sends a \_\_\_\_\_ frame to the secondary.
  - a. poll
  - b. select
  - c. inquire
  - d. acknowledge
- 30. In the stop-and-wait method of flow control, the sender sends \_\_\_\_\_ at a time.
  - a. a variable number of frames
  - b. only one frame
  - c. a set number of frames
  - d. two frames
- 31. Token Ring and FDDI both use \_\_\_\_\_ as an access method.
  - a. CSMA
  - b. CSMA/CD
  - c. token passing
  - d. HDLC
- 32. In the sliding window method of flow control, the receiver window \_\_\_\_\_ size when an ACK is sent.
  - a. increases in
  - b. decreases in

- c. doubles in
- d. remains its original

33. \_\_\_\_\_ layer protocols contain rules for line discipline, flow control, and error handling.

- a. Data link
- b. Network
- c. Physical
- d. Transport

## MULTIPLEXING

1. Which multiplexing technique is used for analog signals? **FDM**
2. Which multiplexing technique is used for digital signals? **TDM**
3. Which multiplexing technique shifts each signal to a different carrier frequency? **FDM**
4. Which multiplexing technique involves signals composed of light beams?  
**WDM**
5. \_\_\_\_\_ is the set of techniques that allows the simultaneous transmission of multiple signals across a single data link.  
**MULTIPLEXING**
6. \_\_\_\_\_ is designed to use the high bandwidth capability of fiber-optic cable.  
**WDM**
7. \_\_\_\_\_ is an analog multiplexing technique to combine optical signals.  
**WDM**
8. \_\_\_\_\_ is a digital process that allows several connections to share the high bandwidth of a link.  
**TDM**
9. We can divide \_\_\_\_\_ into two different schemes: synchronous or statistical.

## TDM

10. In \_\_\_\_\_ TDM, each input connection has an allotment in the output even if it is not sending data.

synchronous

11. The \_\_\_\_\_ technique uses M different carrier frequencies that are modulated by the source signal. At one moment, the signal modulates one carrier frequency; at the next moment, the signal modulates another carrier frequency.

FHSS

12. The \_\_\_\_\_ technique expands the bandwidth of a signal by replacing each data bit with n bits using a spreading code.

DSSS

13. Groups, super groups, master groups, and jumbo groups are terms used in \_\_\_\_\_.

FDM

14. Multilevel multiplexing is a strategy used in \_\_\_\_\_. TDM

## LINK STATE ROUTING

1. A switch that waits until the whole packet has arrived before making routing decision, is called a \_\_STORE AND FORWARD\_\_ switch.
2. In link state routing, the updating packet conveys the knowledge of the router about \_\_\_\_THE NEIGHBOURHOOD\_\_\_\_.
3. A switch that makes routing decision as soon as the destination address has arrived is called a \_\_CUT-THROUGH\_\_ switch.
4. In link state routing, a router sends its updating packet \_\_\_\_TO EVERY OTHER ROUTER IN THE INTERNETWORK(THROUGH FLOODING)\_\_\_\_.
5. In link state routing, the updating packets are sent \_\_\_\_WHEN THERE IS A CHANGE\_\_\_\_.
6. In link state routing, the routing table for each router is \_\_\_\_DIFFERENT FROM\_\_\_\_ other routers

7. In link state routing, the link state database for each router is THE SAME IS \_\_\_\_\_ other routers
8. If we have to enter the entries in the bridge table manually, the bridge is a SIMPLE bridge.
9. If we do not have to enter the entries in the bridge table manually, the bridge is a TRANSPARENT bridge.
10. If a bridge is connected to 5 networks, it is called a MULTIPORT bridge.
11. The calculation time for the distance vector routing algorithm is LESS THAN the one for the link state routing.
12. The storage media for the distance vector routing algorithm is LESS THAN the one for the link state routing.
13. The Dijkstra algorithm is used in LINK STATE routing to find the shortest path tree.
14. The Dijkstra algorithm finds the shortest path using the CUMULATIVE cost.
15. In the Dijkstra algorithm the process of finding the shortest path starts with a tree with 1 node(s).
16. In the Dijkstra algorithm the shortest path tree has NO loop(s)

## DATA LINK LAYER-DATA LINK CONTROL-FLOW CONTROL

1. In the sliding window method of flow control, the receiver window \_\_\_\_\_ size when frames are received DECREASES IN
2. In the sliding window method of flow control, the receiver window \_\_\_\_\_ size when an ACK is sent INCREASES IN
3. A sender has a sliding window of size 15. The first 15 frames are sent. The first ACK received is ACK 15. What frame(s) has the receiver accepted? FRAME 0 TO 14
4. A sender has a sliding window of size 15. The first 15 frames are sent. The first ACK received is ACK 15. What frame is the receiver expecting? FRAME 15
5. A sender has a sliding window of size 15. The first 15 frames are sent. How many frames are in the window now? 0
6. A sender has a sliding window of size 15. The first 10 frames are sent. How many frames are in the window now? 5
7. A sender has a sliding window of size 15. The first 15 frames are sent. The receiver receives 10 frames. How many frames can the receiver still receive? 5
8. A sender has a sliding window of size 15. The first 15 frames are sent. The receiver sends an ACK 10. How many spaces does the receiver window expand? 10

9. A sender has a sliding window of size 15. The first 15 frames are sent. The receiver sends an ACK 10 and expands its window. What is the size of the receiver window now? **15**
10. The receiver's window in a sliding window protocol expands when \_\_\_\_\_.  
**AN ACK IS SENT**
11. The sender's window in a sliding window protocol expands when \_\_\_\_\_.  
**AN ACK IS RECIEVED**
12. The stop-and-wait flow control method is the same as the sliding window method with a window size of \_\_\_\_\_. **1**
13. Flow control is mainly a function of the \_\_\_\_\_ layer  
**DATA LINK**
14. . \_\_\_\_\_ is the regulation of the amount of data that can be sent.  
**FLOW CONTROL**
15. Which data link layer function answers the question: How much data may be sent?  
**FLOW CONTROL**
16. Stop-and-wait is a \_\_\_\_\_ technique  
**FLOW CONTROL**
17. Sliding window is a \_\_\_\_\_ technique  
**FLOW CONTROL**
18. In the stop-and-wait method of flow control, the sender sends \_\_\_\_\_ at a time  
**ONLY ONE FRAME**
19. In the sliding window method of flow control, the sender may send \_\_\_\_\_ at a time  
**SEVERAL FRAMES**
20. In the stop-and-wait method of flow control, after the receiver receives a data frame, \_\_\_\_\_ frame can be sent  
**A OR B(A.AN ACK B.A NAK)**
21. What is the main disadvantage of stop-and-wait flow control?  
**INEFFICIENT**
22. In the stop-and-wait method of flow control, if 100 good data frames are sent and received, how many ACK frames have been sent by the receiver?  
**100**
23. In the sliding window method of flow control, if 100 good data frames are sent and received, how many ACK frames have been sent by the receiver? .  
**SOME NUMBER LESS THAN OR EQUAL TO 100**
24. In the sliding window method of flow control, if the frame numbers range from 0 to 31, the size of the window is \_\_\_\_\_ frames.  
**31**
25. In the sliding window method of flow control, if the frame numbers range from 0 to 63, the size of the window is \_\_\_\_\_ frames. **63**
26. In the sliding window method of flow control, the sender window \_\_\_\_\_ size when frames are sent. **DECREASES IN**
27. In the sliding window method of flow control, the sender window \_\_\_\_\_ size when an ACK is received. **INCREASES IN**

# TCP

1. Which of the following is false with respect to TCP?

- a) Connection-oriented
- b) Process-to-process
- c) Transport layer protocol
- d) Unreliable

2. In TCP, sending and receiving data is done as \_\_\_\_\_

- a) Stream of bytes
- b) Sequence of characters
- c) Lines of data
- d) Packets

3. TCP process may not write and read data at the same speed. So we need \_\_\_\_\_ for storage.

- a) Packets
- b) Buffers
- c) Segments
- d) Stacks

4. TCP groups a number of bytes together into a packet called \_\_\_\_\_

- a) Packet
- b) Buffer
- c) Segment
- d) Stack

5. Communication offered by TCP is \_\_\_\_\_

- a) Full-duplex
- b) Half-duplex
- c) Semi-duplex
- d) Byte by byte

6. To achieve reliable transport in TCP, \_\_\_\_\_ is used to check the safe and sound arrival of data.

- a) Packet
- b) Buffer
- c) Segment
- d) Acknowledgment

7. In segment header, sequence number and acknowledgement number fields refer to \_\_\_\_\_

- a) Byte number
- b) Buffer number

- c) Segment number
- d) Acknowledgment

**8. Suppose a TCP connection is transferring a file of 1000 bytes. The first byte is numbered 10001. What is the sequence number of the segment if all data is sent in only one segment?**

- a) 10000
- b) 10001**
- c) 12001
- d) 11001

Explanation: The sequence number given to first byte of a segment, with respect to its order among the previous segments, is the sequence number of that segment.

**9. Bytes of data being transferred in each connection are numbered by TCP. These numbers start with a \_\_\_\_\_**

- a) Fixed number
- b) Random sequence of 0's and 1's
- c) One
- d) Sequence of zero's and one's**

**10. The value of acknowledgement field in a segment defines \_\_\_\_\_**

- a) sequence number of the byte received previously
- b) total number of bytes to receive
- c) sequence number of the next byte to be received**
- d) sequence of zeros and ones

**LINK-URI utile de unde ia profu intrebari din ce observ:**

1. <https://www.sanfoundry.com/computer-networks-questions-answers-tcp/>
2. <http://krypton.mnsu.edu/~yf3655je/coms462s02/exam2mcsol.pdf>  
nu mai gasesc nimic :(
3. <https://examradar.com/data-communication-networking-data-link-layer-data-link-control-flow-control-mcqs/>

## **TIP ESEU**

1. Care este rolul porturilor la nivelul transport?
2. Prezentați 2 diferențe dintre tehnicile FHSS și DSSS, care stau la baza transmisiei în cadrul rețelelor fără fir.

## Summary:

1.FHSS changes the frequency being used while DSSS changes the phase.

### FHDS versus DSSS:

FH systems use a radio carrier that “hops” from frequency to frequency in a pattern known to both transmitter and receiver

- Easy to implement

- Resistance to noise

- Limited throughput (2-3 Mbps @ 2.4 GHz)

DS systems use a carrier that remains fixed to a specific frequency band. The data signal is spread onto a much larger range of frequencies (at a much lower power level) using a specific encoding scheme.

- Much higher throughput than FH (up to 11 Mbps)

- Better range

- Less resistant to noise (made up for by redundancy – it transmits at least 10 fully redundant copies of the original signal at the same time)

2.FHSS is easier to synchronize than DSSS.

3.DSSS is used in positioning systems while FHSS is not.

Mai in detaliu:

<http://www.differencebetween.net/technology/difference-between-fhss-and-dsss/>



## Spread Spectrum

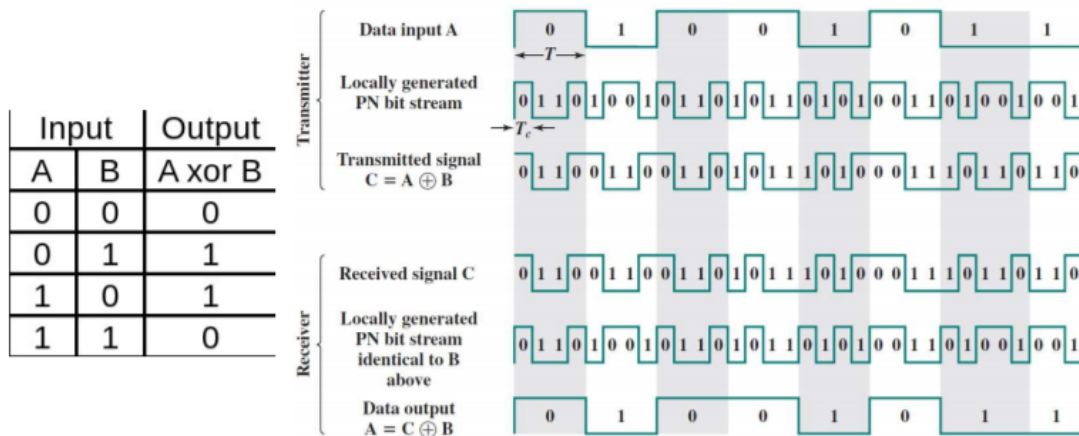
**Direct sequence (DSSS):** each bit in the original signal is represented by multiple bits in the transmitted signal – chipping code- (using more bits, wider bandwidth).

One technique: to combine the original digital information stream with a pseudo-random bit stream, by using a XOR function; a '1' in data stream will invert the pseudorandom bit stream, a '0' will pass unchanged the chipping code.

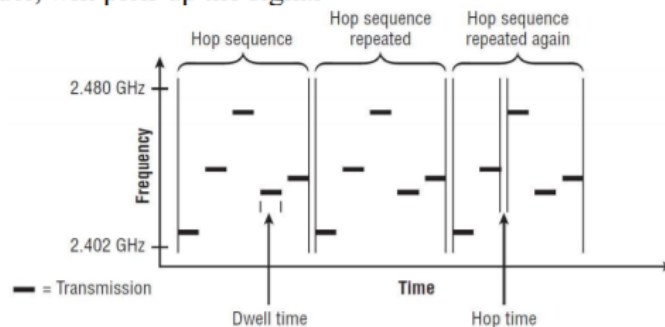
Barker code:

Binary data 1 = 1 0 1 1 0 1 1 0 0 0

Binary data 0 = 0 1 0 0 1 0 0 0 1 1 1



**Frequency hopping (FHSS):** signal is broadcast over a seemingly random series of RF carriers (use of table-derived frequencies), hopping from one frequency to another, at split-second intervals; the receiver, hopping between frequencies in synchronization with the sender, will pick-up the signal



- Care este rolul campului TTL din cadrul antetului IPv4?

Under the Internet Protocol, TTL is an 8-bit field. In the IPv4 header, TTL is the 9th octet of 20.

TTL - TIME TO LIVE

Time to Live: 8 bits -din documentatia oficiala

This field indicates the maximum time the datagram is allowed to remain in the internet system. If this field contains the value zero, then the datagram must be destroyed. This field is modified in internet header processing. The time is measured in units of seconds, but since every module that processes a datagram must decrease the TTL by at least one even if it process the datagram in less than a second, the TTL must be thought of only as an upper bound on the time a datagram may exist. The intention is to cause undeliverable datagrams to be discarded, and to bound the maximum datagram lifetime.

The time to live is set by the sender to the maximum time the datagram is allowed to be in the internet system. If the datagram is in the internet system longer than the time to live, then the datagram must be destroyed. This field must be decreased at each point that the internet header is processed to reflect the time spent processing the datagram. Even if no local information is available on the time actually spent, the field must be decremented by 1. The time is measured in units of seconds (i.e. the value 1 means one second). Thus, the maximum time to live is 255 seconds or 4.25 minutes. Since every module that processes a datagram must decrease the TTL by at least one even if it process the datagram in less than a second, the TTL must be thought of only as an upper bound on the time a datagram may exist. The intention is to cause undeliverable datagrams to be discarded, and to bound the maximum datagram lifetime.

Some higher level reliable connection protocols are based on assumptions that old duplicate datagrams will not arrive after a certain time elapses. The TTL is a way for such protocols to have

an assurance that their assumption is met.

## ICMP and internet routes

List of all routers on path from *A* to *B* is called the *route* from *A* to *B*

TCP/IP *traceroute* program uses UDP to non-existent port and TTL field to find route via *expanding ring* search

*traceroute* must accommodate varying network delays & dynamically changing routes

Sends ICMP echo messages with increasing TTL

- Router that decrements TTL to 0, sends ICMP *time exceeded* message, with router's address as source address
- First, with TTL 1, gets to first router, which discards and sends time exceeded message
- Next, with TTL 1, gets through first router to second router
- Continue until message from destination received

4. Care este diferenta dintre paradigmele de comunicatie simetrica si asimetrica?

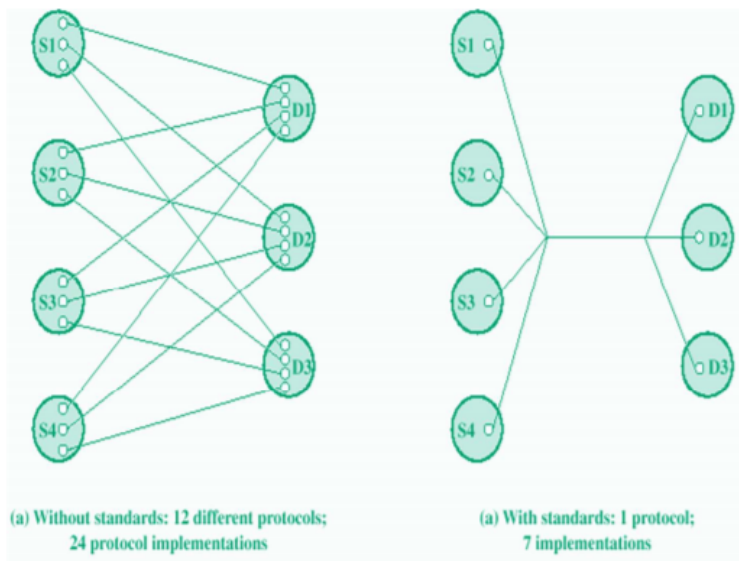
Symmetric or **asymmetric**

Symmetric

Communication between  
peer entities

Asymmetric

Client/server



Standard or nonstandard

Nonstandard protocols built for specific computers and tasks

K sources and L receivers leads to  $K \cdot L$  protocols and  $2 \cdot K \cdot L$  implementations

If common communications protocol used,  $K + L$  implementations needed (see figure above)

The difference between the **symmetric** and **asymmetric** models of **communication** is that **symmetrical communication** provides a more balanced form of **communication** between the organization **and** its publics instead of one party having more power than the other in **asymmetrical communication**.

## Arogante

Both connections have their benefits, but what works best for your business will depend on how you use the internet.

Investing in symmetrical speeds will make more sense if you are...

- A mid-size or large company with many employees.
- Heavy users of collaboration tools (including UCaaS and voice).
- Moving (or are already using) applications and services to the cloud (Google Drive, Office 365, Salesforce, etc).
- Part of a team that is distributed across a large geographic area – including multiple sites, locations, & remote workers.
- Productivity bottlenecks are appearing between your tools.

- Scaling up your operations and need to prepare additional capacity for growth.

An asymmetrical connection might fulfill your needs if you are...

- A small company with only a few employees.
- Not relying on the internet for resource-heavy uses – mostly you're just web-surfing.
- You have one location, or are not part of a larger network.

5. Care sunt principalele elemente ce definesc un sistem bazat pe cablarea structurata?

### Elements of Structured Cabling

A **structured cabling system (SCS)**, featuring the open architecture, is a set of cabling and connectivity products that integrates the voice, data, video, and various management systems of a building.

A **BMS (Building Management System)** consists of:

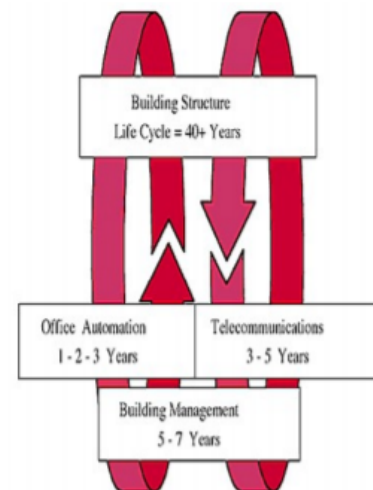
- safety, life & fire alarms
- security and access control (SAC)
- energy systems (EMS)
- heating, ventilation and air conditioning (HVAC)

Usually were cabled separately and voice & data cabling isn't addressed during construction.

Planning and installing the SCS from this phase => lower construction, labour and operational costs.

**With proper planning, it is not necessary to provide new cabling every time systems are changed or upgraded.**

(after International Engineers Consortium).



**Structured cabling system** consists of six essential **components**. They are horizontal **cabling**, backbone **cabling**, work area, telecommunications closet, equipment room & entrance facility.

