7. The following cabling is used for Ethernet networks (at least 10 Mbit / s)

□ Supermode optical fiber (supermode)

■ Thin coaxial cable

■ FTP (twisted pair shielded with foil)

□ UTP category 1

■ According to EIA / TIA 568A / B standard

□ According to ISO 8859-2

8. The LSA (link state algorithm) method can be said

■ It is an example of dynamic routing

■ Routers know the network topology

□ Routers send a routing table to neighbors

□ Converges slowly

□ It is represented by the RIP routing protocol

■ It is represented by the OSPF routing protocol

9. TCP protocol header

■ Contains source and destination port numbers

□ Contains a checksum, which does not have to be filled in // hmmm

■ Contains an array of single-bit flags used to control the connection

□ Contains the protocol number carried in the TCP segment

■ Contains the number of the last correctly received octet

□ It is inserted into the frames directly at the beginning of the data field

L3 TCP header has following properties: OFFICIAL

■ It contains the destination and source port numbers

□ It contains the optional header checksum

■ It contains several bit flags used for the connection management

□ It contains application layer protocol ID, identifying the higher-level protocol carried in the TCP segment

■ It may contain the ACK number informing about the next octet which can be sent.

□ Is placed directly in the beginning of the data field in L2 frames

10. Switch (SWITCH)

■ Sends an Ethernet frame with the MAC address FF: FF: FF: FF: FF: FF to all interfaces.

■ Selects the interfaces to which the frame will be sent according to the destination MAC address.

□ Routes packets based on the destination IP address

□ Has an IP address assigned to each port

■ Allows you to define virtual LANs (VLANs)

■ It can send frames from different VLANs to another switch using TRUNK ports

11. SMTP server communicates

□ with the POP3 server from which it receives e-mails

■ with SMTP client (user agent)

□ with both POP3 and IMAP server

■ with another SMTP server.

□ with IMAP server

□ with IMAP client

7. The following types of modulations are commonly used for data transmission.

■ Amplitude

□ Quantum

■ Frequency

■ Phase

□ Doppler

□ Binary

8. Methods of non-deterministic approach to channel sharing are:

□ Central control

□ Distributed handover control…

■ Aloha

□ Virtual logical circle

■ CSMA / CD method

□ Binary search

9. The DVA method (distance vector algorithm) can be said:

■ It is an example of dynamic routing

□ Routers know the topology of the entire network

■ Routers provide neighbors with a routing table.

■ converges slowly

■ It is represented by the RIP routing protocol

□ It is represented by the OSPF routing protocol

10. Router

□ Sends an Ethernet frame with the MAC address FF: FF: FF: FF: FF: FF to all interfaces.

□ Selects the interfaces to which the frame will be sent according to the destination MAC address.

■ Routes packets based on the destination IP address

□ Increases the TTL field of each passing packet by the configured value.

■ Has an assigned IP address on each port.

□ Must have the entire routing table manually defined by the administrator (except for connected networks.)

11. SMTP server *

■ Direct e-mails from the mail client (user agent)

□ Sends e-mails by mail client (user agent)

□ If there is no mailbox, the recipient sends the client an ICMP Destination Unreachabble message

■ Can establish a TCP connection with other SMTP servers.

■ Receives e-mails from another SMTP server.

□ Sends e-mails from another SMTP server as UDP datagrams.

7. Network topologies are

■ Bus

■ Star

■ Distributed star (tree)

□ Square

■ Circle

□ Polynomial

7. Ethernet topologies are

■ Bus

■ Star

■ Distributed star (tree)

□ Square

□ Circle

□ Polynomial

8. RIP protocol *

■ Runs between routers (ROUTERS)

□ Runs between switches (SWITCHi)

■ Passes a routing table to a neighbor

□ Passes the table of <MAC address, port> pairs to the neighbor

■ Calculates the shortest (cheapest) routes to all networks

□ Prevents loops on the 2nd layer

9. The following types of name server records have the following meanings

□ SOA - Defines all non-authoritative servers for a given domain.

■ NS - specifies the authoritative name server for the given domain

□ MX - specifies WINS server (name server for MS NetBios protocol)

□ A - assigns a domain name to the IP address

■ PTR - assigns a domain name to a special IP address entry

■ CNAME - specifies the alias for the given domain name

10. In which situations is an ICMP message sent to the sender?

□ If the packet size exceeds 64 KB and fragmentation is disabled.

□ When a packet is lost on a line.

□ If the packet size exceeds the length of the frame data field of a line and fragmentation is enabled.

■ If the packet size exceeds the data length of the frame field of some line and frag is disabled.

■ If the router receives a packet with TTL = 1 and forwards it to another router according to the routing table.

□ In response to a DNS query

11. The following protocols are used to send and receive e-mail

■ SMTP

□ SNMP

■ POP3

■ IMAP

□ FTP

□ BOOTP

Station X receives a TCP segment with the ACK flag set and the following values in the header:

Sequence number: 1000 Acknowledge number: 500 Window: 100

Based on this information, station X may send bytes with sequence numbers

a) 10001 - 1500

b) 501 - 600

c) 501 - 1000

d) 101-500

e) 101 - 1000

For Distance vector routing protocols, routers send

(a) information on adjacent lines whenever the status changes

(b) the contents of its routing table only if it is changed

c) periodic information on adjacent lines

d) periodically the contents of its routing table

The network is configured as shown (MAC addresses are marked symbolically for clarity). All stations have correctly configured IP addresses, subnet masks and default gateways. What source and destination MAC and IP addresses will be in the frame that arrives at the destination station when sending packets.

a) from station A to station C b) from station B to station A

7. ISO-OSI reference model

□ Contains 10 layers

■ Defines the physical parameters of the interface at layer 1

□ Defines the methods of cable welding on the link layer

■ Layer 3 routing between networks

■ Can use sliding window method to transfer Layer 4 data

□ Defines IP as the standard Layer 3 protocol

8. Serial transmission

□ It is synchronous, asynchronous or antisynchronous.

□ Sends an 8, 16, or 32-bit word in one clock cycle, depending on the implementation

■ In synchronous mode, maintains constant time synchronization of the source and destination.

□ Always uses start bits and stop bits for data transfer.

□ Always resends unconfirmed characters when the timeout expires

■ In synchronous mode, uses wing marks to indicate the boundaries of the data unit.

9. Domain Name Service (DNS)

■ Allows you to use domain names with a component length of up to 63 characters

□ Case sensitive (case-sensitive)

□ Uses a colon as a name separator for name components

■ Uses both UDP and TCP protocols for communication

□ Performs MAC address to IP address translation

■ Allows IP addresses to be translated into domain names

10. What happens if the router cannot deliver an IP packet?

■ The packet is dropped.

□ The router keeps the packet in the buffer until the routing tables are completed.

■ An ICMP error message is sent to the original sender

□ An ICMP error message is sent to the original destination

□ The packet is returned to the previous router.

□ The packet is sent back to the original source.

11. The following protocols are commonly used to download binaries from the Internet

□ SNMP

■ HTTP

■ FTP

■ HTTPS

□ BOOTP

□ DHCP

7. The station can obtain a unique IP address (IPv4) as follows

■ Using DHCP

□ Using the HTTP protocol

■ BOOTP protocol

□ ICMP protocol (IP address request)

□ Using the ARP protocol

□ From the nearest DNS server found by a broadcast message

8. How can the router obtain information about routes to destination networks?

□ The switches inform the surrounding routers that the admin networks have configured in their tables

■ Information is entered statically by the network administrator.

□ Paths are obtained from information collected in ARP tables.

□ Routers and switches forward information about networks they know to each other using routing protocols.

□ The information is sent as a broadcast switch each time a new network segment is connected to it.

□ Information can be obtained by active ARP queries

9. The TCP header contains the following items

■ Bit flag FIN, requesting termination of communication in one direction

□ Bit flag of the NAK indicating that it is a negative acknowledgment

□ NOP bit flag, defining that it is a keep-alive packet

■ An RST bit flag that forces the connection to terminate in both directions

■ The SYN bit flag, which is used when establishing a connection

■ Field specifying the current width of the receive window

10. Methods of deterministic approach to shared channel are

■ Central control

■ Distributed control by passing credentials

□ ALOHA

■ Virtual logical circle

□ CSMA / CD method

■ Binary search

11. Which of the following statements is true about the HTTP protocol?

■ It is built on a client-server architecture

□ Used to obtain an IP address, knowing the MAC address.

□ It is operated over the UDP transport protocol.

□ Used for encrypted web page transmission

□ Used to report errors and special conditions during packet transmission.

■ It runs on the TCP transport protocol.

7. MAC address (globally valid)

■ It is divided into two parts, specifying the manufacturer and the serial number

□ Used to address the target computer on the 3rd layer of the OSI model

□ It is divided into the network address and the end node

□ It consists of four 8-bit numbers

■ It consists of six 8-bit numbers on Ethernet

□ Contains information necessary for packets to be routed by the router

8. Sliding window method *

■ In the GO-BACK-N variant, it requires retransmission of packets from the first lost one

□ Keeps packets that have not yet been confirmed in the receive window.

■ Uses sent packets on the sending side of the window

□ Always requires sending negative acknowledgments (NAK)

■ After the timeout in the GO-BACK-N variant, it resends all unconfirmed packets

□ It is used for data transmission on the Internet using the UDP protocol

9. The types of routing are

■ Static (non-adaptive) routing

■ Hierarchical routing

□ Geographic routing

■ Distributed routing

□ Topological routing

■ Dynamic routing

10. What are the advantages of using static routing over dynamic?

■ less CPU load on the router

■ complete control over the selection of routes used

□ Less configuration effort

□ higher adaptability when changing the topology

■ Higher security than when using the routing protocol

□ can also be used on switches with VLAN support

11. If you do not have an e-mail client, how can you view your e-mail inbox?

□ I will ping with the -t MX option and the address of the server where my mailbox is

□ I will use the telnet program and connect to port 25 (SMTP server port)

□ There is no way to read the contents of the e-mail box

□ I will use the FTP program and connect to port 110 (POP3 server port)

■ I will use the telnet program and connect to port 110 (POP3 server port)

□ I will use the Mail Download Protocol (MDP) using the mdp command

When tracing a network with the traceroute command

a) the sender gradually increases the TTL field in the IP packet header and receives the ICMP Echo Reply message

b) the sender gradually reduces the TTL field in the IP packet header and receives the ICMP Echo Reply message

c) the sender gradually reduces the TTL field in the IP packet header and receives the ICMP Time Exceeded message

d) the sender gradually increases the TTL field in the IP packet header and receives the ICMP Time Exceeded message

The channel is shared by the distributed binary search method. In case of simultaneous transmission of different values by several stations, the channel will be a logical zero. Stations A, B and C compete for the channel with the following addresses:

A: 1101010

B: 1010010

C: 1010101

Determine which bit of the address decides which station will access the channel and which it will.

It compiles fragmented packets according to the Identification, Fragment Offset and

a) source MAC addresses exclusively to the destination station.

b) source MAC addresses of any router on the path.

c) source IP addresses exclusively of the destination station.

d) source IP addresses of any router on the path.

What about MAC addresses 00: BB: BB: BB: 00 and 00: BB: BB: BB: 01?

a) there are two variants of the broadcast address.

b) these are the addresses of stations on the same network segment.

(c) they are addresses assigned to the same manufacturer.

d) these are MAC addresses reserved for the ARP protocol function.

The following occurs in a TCP segment with a source address of 10.0.1.10 and a destination address of 10.0.2.20:

a) Forcible termination of a connection (both sides)

b) One-way termination from 10.0.1.10

c) One-way termination from 10.0.2.20

d) Damage notice

POP3 server

a) It is typically used to send e-mail. mail

b) It is the first server to transmit the message

c) Allows reception of el. mail only after authentication

d) Connects to the DNS server

SMTP server

a) It is typically used to receive electricity. mail

b) As the message passes, it inserts the Received header indicating that the message has passed

c) Allows sending e-mails. mail only after USER and PASS authentication

d) Connects to the DNS server, where it finds out the POP3 domain according to the MX record,

to which he joins and sends him a message

An example of RM OSI layer 7 protocols (full combination)

a) TFTP, HTTP, FTP, ICMP

b) TCP and UDP

c) IP and IPX

d) DNS, HTTP, TFTP

TFTP protocol

■ Allows stations to download the OS boot file from the server

□ Provides a subnet mask

□ Requires a username and password for authentication

■ Allows you to upload a file to the server

□ Uses TCP protocol

■ Uses a stop-and-wait acknowledgment scheme

ASDL technology

□ It is suitable for service providers due to high transmission speeds

■ It allows data to be transmitted over distances of the order of km on a conventional telephone network line

□ Has asymmetric baud rates faster to provider slower reverse

■ Adjusts the actual speed to the line quality

□ Excludes the simultaneous use of an analog telephone

■ Uses a splitter to split the band

Ethernet networks are according to the IEEE 802.3 standard

■ 10Base2 - Ethernet networks on a thin coax cable type RG58

□ 100BaseSX - full duplex transmission over 1 metal wire

■ 10BaseT and 100BaseT - metallic twisted pair networks

□ 100BaseFX - optical paths 10Mbit / s

□ 10BaseGLX - transmission over a classic telephone double line

□ 10GBaseT - 10000 Mbps full duplex optical network

ICMP IPv4 can be used to

□ Assigning a MAC address to an IP address (address resultion)

□ Redirect traffic for one network to another gateway

■ PC availability check (echo request)

■ Destination unreachable information

■ Time exceeded information

□ Information on the number of packets dropped by the router (router drop rate)

FTP protocol

□ UDP data

□ ICMP data

■ TCP data

□ UDP control

□ ICMP control

■ TCP control

Using ISDN for data transmission over the BRI connection gives these possibilities

□ Data channel with a transmission speed of up to 2Mbps

■ Establishing a connection within approx. 1 second

□ Higher baud rate in the direction of the terminal (downstream) than in the direction of the network (upstream)

□ Possibility of bundling up to 16 channels

■ Possibility of slow transmission on channel D if supported by the ISDN network operator

□ Simultaneous use of an analog telephone on the same line

Virtual private networks

□ There are VLAN-based networks that use private IP addresses

■ They use a shared public infrastructure

□ Can be implemented on 3 layers using SSL

■ Can be implemented on 3 layers using IPSec

□ In principle, they do not allow the operation of protocols other than IP

□ They are more expensive to build and manage than private infrastructure

NAT translation

□ When using static NAT, static routing must be used on the internal network

□ NAT allows stations without IP support to communicate with the Internet

■ Increases security by hiding the internal structure of the network

□ Increases the security of the external network against attacks

□ When using pure dynamic NAT, servers accessible from the Internet cannot be operated on the internal network

□ Private IP addresses must be used in the internal network behind NAT, otherwise it will not work

(// the addresses used will cause problems, but NAT will work by itself)

Protocol for services www

□ In HTTP version 1.0 multiple documents in 1 connection

■ In HTTP 1.1, multiple documents in 1 connection

□ In HTTP version 1.0 encrypts data

□ Encrypts data in HTTP version 1.1

■ HTTPS is required to encrypt data in both 1.0 and 1.1

□ Enables the transfer of binary data from version 1.1

Stateless filtration

■ Each UDP packet

■ Each TCP packet

■ Each IP packet

UDP protocol

■ Contains source and destination port numbers

■ Contains a CRC (checksum) that does not need to be filled in

The transmission medium can be shared

■ Frequency multiplexing

■ Time division multiplexing

■ Wave multiplex

encrypted

■ ensuring the integrity of data transmission, (data has not been changed)

■ symmetric encryption is faster than asymmetric (private and public key)

For the question with the picture where station A sends the frame to station C, the answers are:

sends a request to the address: 10.0.0.1

at MAC FF: FF: FF: FF: FF: FF

and MAC-1

Not to be confused with the question

What source and destination MAC and IP addresses will be in the frame that arrives at the destination station when sending packets.

a) from station A to station C b) from station B to station A

Dijkstra's algorithm for traversing a tree with evaluated edges

which protocol does it use?

■ OSPF protocol

For TCP connections with the FIN command, the party lets you know

■ that he will no longer send anything and that he wants to end the connection

The IP address is

□ It is divided into two parts, specifying the manufacturer and the serial number

■ Used to address the target computer on the 3rd layer of the OSI model

■ It is divided into a part of the network address and a part of the end node address

■ It consists of 4 8-bit numbers

□ It consists of 6 8-bit numbers on Ethernet

□ Contains information necessary for packet routing by the switch

Spanning Tree

□ Runs between routers

■ Runs between switches

□ Passes a routing table to a neighbor

□ Passes a table of pairs (MAC address, port) to a neighbor

■ Calculates the shortest (cheapest) paths to a tree root

■ Prevents layer 2 loops

IP (IPv4) header

■ Contains the source and destination addresses

□ Contains source and destination port numbers

□ Contains the source flag FF (force fragments), forcing fragmentation

■ Contains a checksum

■ Contains a TTL (time to live) field, at which the packet is dropped

■ Can be of variable length

How can we characterize an asymmetric cryptographic system?

■ Uses two keys as an interrelated pair

□ Encrypts data on the source with two keys for greater security

□ Uses one shared key

□ Uses DES, 3DES or AES algorithms

■ Uses one key for encryption and the other for decryption

□ Uses efficient algorithms that are not computationally intensive and easy to implement in hardware

Comparison of DVA and LSA routing algorithms

■ TWO is easier to implement and less computationally intensive than LSA

□ LSA converges significantly longer than TWO

■ In the case of DVA algorithms, routing information is propagated between routers in specified time intervals (eg 30s). In the case of LSA, it is propagated only when it is changed // FAKE, see EIGRP

■ LSAs compile a routing table based on knowledge of the network topology, DVA algorithms compile a routing table based on the routing tables of other mixers.

□ Both TWO and LSA algorithms use the same type of metric, so there is always a number of mixers between source and destination

□ LSA routing algorithms are more suitable for large networks due to fast convergence, stability

Which of the following protocols can we disable with an ACL without compromising the functionality of sending and receiving e-mail?

□ POP3

□ SMTP

■ ICMP

■ FTP

□ DNS

■ TFTP

User Datagram Protocol (UDP)

□ It is a second layer protocol

□ always ensures reliable network data transmission

■ is used when transmitting data by an unacknowledged data service

■ contains a checksum field in the header

□ contains the source and destination port number in the header. However, these items are optional and may not be used

□ used only for audio transmission in IP networks.

What is the maximum distance between two active elements in 100BaseT Ethernet by default when using UTP5 cables?

a) 82 meters **b) 100 meters** c) 185 meters d) 300 meters e) 305 meters

The Spanning Tree protocol is used to

a) find the shortest paths from each switch to each network segment

b) blocking the connections forming loops between the switches

c) find the shortest routes from each router to each network segment

d) blocking loop connections between routers

e) blocking the joints having the longest path to the root of the tree

Which of the following terms indicates the time between the sending of a packet by the sender and its receipt by the recipient?

a) bandwidth

b) delay

c) time-to-live (TTL)

d) checksum

e) scatter (jitter)

Metrics in DVA (Distance Vector Algorithm)

□ is a number that represents the quality of the line to the neighboring router

■ is a number that indicates the number of hops on the path from the source to the destination // RIP ONLY

□ specifies the number of IP address bits that are used for network addressing

■ is usually limited by the maximum value above which routing information is considered invalid

■ varies depending on the number of routers in the selected network path

□ is completely independent of the number of routers in the selected network path

Protocols 7. OSI model layers are (all in variant)

a) FTP, TFTP and HTTP

b) TCP and UDP

c) IP and IPX

d) DNS, ARP, DHCP and BOOTP

e) TCP, UDP and IP

Dynamic routing ensures automatic propagation of routing information between routers always makes routers available knowledge of network topology is one of the approaches to ensure the routing of the routing table router is one of the approaches to ensure the fulfillment of the switch table switches allows remote management of switches allows extending the routing table between routers

Which network security claims are valid?

□ In practice, encryption is implemented exclusively on the presentation layer

□ The SSL layer provides encryption on the 2nd layer of OSI RM

■ IPSec provides OSI RM Layer 3 encryption

□ Encryption on the 2nd layer of OSI RM is the most effective for encrypting Internet traffic

■ Encryption can be technically implemented on multiple layers of OSI RM at the same time

■ With asymmetric encryption, you can encrypt with a private key and decrypt with a public key or vice versa

The server operates two services - HTTP and FTP. How does the server distinguish which type of connection it is at the moment it registers a connection attempt?

c) The incoming segment contains the destination port, which determines which service it is.

Add: ARP protocol is used

to obtain a Layer 2 address based on the known OSI-RM Layer 3 address. possibly vice versa

From the station with the MAC address 01: 23: 45: 67: 89: AB and the IP address 1.2.3.4/24, an ARP request is sent to determine the address of the 2nd layer of the OSI-RM station with the IP 1.2.3.2, whose address is 0A: BC : DE: F1: 23: 45.

The request frame will be sent to the destination c) MAC address FF: FF: FF: FF: FF: FF

The routing table must always contain the following columns:

■ The IP address of the network destination station, which the given table row represents

■ The interface through which the packet will be sent or the IP address of the neighbor to whom the packet will be sent

□ The IP address of the computer that sent the address

□ A metric that always represents the number of routers on the way to the destination

□ A list of protocols that the network supports

□ TCP ports that can be used in the destination port field in the TCP header

Compared to TCP and UDP protocols

□ TCP burdens the network much less than UDP when transmitting small amounts

■ Unlike UDP, TCP is able to ensure that transmitted data is always delivered to the recipient without any errors caused by its transmission over the network.

□ UDP has a much longer header than TCP

■ Both protocols use 16-bit numbers in their headers to identify the source and destination ports.

□ The UDP protocol may have a broadcast or multicast address specified as the destination address. TCP does not allow this.

□ The header of both protocols is the same, but it provides network services

NAT

□ Means Network Access Tunnel

□ Used for secure remote connection to the corporate network

■ This is an example of IP addresses

■ Allows you to change the destination port in the TCP segment

■ Allows you to change the source port in the TCP segment

□ Encrypts data in the transparent layer of the OSI model

TFTP protocol

■ Uses UDP on Layer 4

■ It is used for its simplicity to load the file to start the OS from the server (network boost)

□ Due to the data size limit in the UDP datagram, it can only transfer files up to 64KB in size

□ Uses sliding window

□ Transfers data only from the server to the client

□ Uses an encrypted connection

The following applies to the physical layer of the OSI model

■ can report error states of the connection layer (grygarek says yes)

□ defines the method of addressing end stations

□ an example of an element of this layer is a switch

■ An example of an element of this layer is a fungus

■ provides a service for transmitting a serial bit stream

□ provides errors in the data part of the frame during transmission

Select the statement that characterizes the (globally valid) MAC address

□ consists of four 8-bit numbers

■ consists of six 8-bit numbers

□ Used to address the target computer on the 3rd layer of the OSI model

□ Contains information necessary for routing the router packet

■ the first part specifies the manufacturer, the second the serial number

□ is divided into site address and end node

In comparison of DVA and LSA routing algorithms

■ TWOs typically converge longer than LSA

□ LSAs are easier to implement and computationally less demanding than TWOs

□ TWO and LSA algorithms use the same type of metric and that is always the number of routers between the source and destination

□ TWO I compile routing tables based on knowledge of site topology, LSA algorithms compile routing table based on routing tables of other algorithms

□ In the case of the DVA algorithm, the routing information is distributed between the routing networks at specified time intervals. In the case of the LSA algorithm, the sirens are only changed when they are changed.

// watch out for EIGRP which is TWO wide when changing!

□ TWO routing algorithms are more suitable for large networks due to fast convergence.

The network traverses a TCP segment with source port 100, destination port 200, and SYN and ACK flags set. This segment represents

○ request to establish a connection from the client from port 100 to server port 200

○ a request to establish a connection from the client from port 200 to server port 100

○ Rejection of the request to establish a connection to port 200 by the server

○ The server's response to the connection establishment request to port 200 from client port 100

○ Rejection of the request to establish a connection to port 100 by the client

■ The server's response to the connection establishment request to port 100 from client port 200

Intrusion Detection System is a tool for

■ Detection of a network attack or operating system

○ encryption of communication in the VPN tunnel

○ IP packet routing between VLANs

○ Primary and secondary DNS synchronization

○ Frame switching between VLANs

What can we say about the RIP protocol

■ Sell the contents of your routing table to a neighbor

■ Used on routers

■ Detects the shortest routes to all networks - the number of jumps is decisive

○ Sale to neighbor table pairs (MAC address, post)

○ Prevents loops on the 2nd layer of the ISO-OSI Reference Model

○ Used on switches

IP (IPv4) header

■ Does not contain source and destination port numbers

■ Contains the source and destination addresses

○ It has a fixed length

○ Contains a TTL field, incremented as the router passes

■ Contains the MF bit flag, individually indicating fragmentation

○ Contains the checksum of the frame

ISO-OSI reference model

- Defines the physical parameters of the interface on layer 1
- Layer 3 describes communication between different LANs through intermediaries
  - Defines TCP as the standard Layer 3 protocol
  - Contains 15 layers
  - At layer 3, it describes communication between directly interconnected systems
  - Defines on the connection layer the ways of connecting the cable (status parameters, etc.)

DNS - Domain Name Service

- Uses UDP and TCP protocols for communication
- Allows you to use domain names with a component length of up to 63 characters
- Allows IP addresses to be translated into domain names
  - Performs MAC address to IP address translation
  - Distinguishes lowercase and uppercase letters
  - Used as a separator for colon name components

POP3 server

- Allows you to read the contents of the mailbox only after prior authentication

The possibilities of sharing the transmission medium are

- Cast multiplex
- Wave multiplex
- Frequency multiplex
  - Cannot share at all
  - Voltage multiplex

Which of the following statements is true about the HTTP protocol?

■ It runs on the TCP transport protocol

■ It is built on a client-server architecture

○ It is operated over the UDP transport protocol

○ Used to obtain an IP address when knowing the MAC address

○ Used to report errors and special conditions during packet transmission

○ Used for encrypted web page transmission

A topological database that represents the topology of a given site

□ Invited when using the DVA algorithm for dynamic routing // file no

□ is used by the RIP protocol

■ is used in a dynamic direction to find the shortest paths to individual networks // file yes

○ Not used in dynamic routing at all

The server operates two services - DNS and TFTP. How does the server distinguish which type of request it is at the moment when the request is received from the client?

■ The incoming datagram contains the destination port, which determines which service it is

What is the RTS-CTS mechanism used for in IEEE 802.11 networks?

■ To reserve a channel for the intended transmission of the frame

The problem of the hidden node lies in

■ Incomplete mutual audibility of stations

Translated band transmission (BROADBAND)

■ Allows you to transmit multiple channels with one medium

□ Enables transmission, but at the cost of degrading the use of the transmission medium

■ Indicates the use of a band other than a predefined transmission band

■ Used in LANs in ETHERNET technology

□ It always uses more bandwidth than baseband transmission

□ It is mainly used for data transmissions in combined LAN networks

That's the second one, if it's not 10BaseT, then it's 10BroadbandT ... // ehm? what do you mean: I guess I already understand

A reliable two-way logical channel built on top of the TCeP protocol from the protocol family

TCP / IP

○ Allows you to close it for transmission in one direction and further sending data in the other direction. Transmitted

the data are then no longer confirmed by the receiving party

○ Always ensures that data cannot be eavesdropped on during transmission

○ It always ensures that the transmitted data will be encrypted before it is sent to the network

■ Ensures that the transmitted data will not be invalidated by an error (especially the loss of tcp

segment)

■ Allows it to close for one-way transmission and another in the other direction.

The transmitted data is then still confirmed by the receiving party

■ Allows control of data flow between sender and recipient through buffer propagation (window size)

by the recipient

Select the statement that characterizes the (globally valid) MAC address

○ It consists of four 8-bit numbers

■ It consists of six 8-bit numbers

○ Used to address the target computer on the 3rd layer of the OSI model

○ Contains information necessary for routing the router packet

■ the first part specifies the manufacturer, the second the serial number

○ It is divided into a site address and an end node

In comparison of DVA and LSA routing algorithms

■ TWOs typically converge longer than LSA

○ LSAs are easy to implement and computationally less demanding than TWOs

○ TWO and LSA algorithms use the same type of metric and that is always the number of routers between

source and goal

○ TWO compile routing tables based on knowledge of site topology, LSA algorithms

I compile a routing table based on routing tables of other algorithms

■ Routing information is in the case of the DVA algorithm between the routing networks specified

time intervals. In the case of the LSA algorithm, the sirens are only changed when they are changed.

○ TWO routing algorithms are more suitable for large networks due to fast convergence

The network traverses a TCP segment with source port 100, destination port 200, and s

set SYN and ACK flags. This segment represents

○ request to establish a connection from the client from port 100 to server port 200

○ a request to establish a connection from the client from port 200 to server port 100

○ Rejection of the request to establish a connection to port 200 by the server

○ the server's response to the connection establishment request to port 200 from client port 100

○ Rejection of the request to establish a connection to port 100 by the client

■ The server's response to the connection establishment request to port 100 from client port 200

Intrusion Detection System is a tool for

■ Detection of a network attack or operating system

○ encryption of communication in the VPN tunnel

○ IP packet routing between VLANs

○ Primary and secondary DNS synchronization

○ Frame switching between VLANs

What can we say about the RIP protocol

■ Transports the contents of your routing table to a neighbor

■ Used on routers

■ Detects the shortest routes to all critical networks

is the number of jumps

○ Sale to neighbor table pairs (MAC address, post)

○ Prevents the formation of loops on the 2nd ISOOSI layer

Reference model

○ Used on switches

IP (IPv4) header

■ Does not contain source and destination port numbers

■ Contains the source and destination addresses

○ It has a fixed length

■ Contains a TTL field, incremented as the router passes

■ Contains the MF bit flag, individual fragmentation

○ Contains the checksum of the frame

ISOOSI reference model

■ Defines the physical parameters of the interface on layer 1

■ Layer 3 describes communication between different LANs through intermediaries

○ Defines TCP as the standard Layer 3 protocol

○ Contains 15 layers

○ At layer 3, it describes communication between directly interconnected systems

○ Defines the ways of connecting the cable (status parameters, etc.) on the connection layer.

DNS Service

domain names

■ Uses UDP and TCP protocols for communication

■ Allows you to use domain names with a component length of max. 63 characters

■ Allows IP addresses to be translated into domain names

○ Performs MAC address to IP address translation

○ Distinguishes lowercase and uppercase letters

○ Used as a separator for colon name components

POP3 server

■ Allows you to read the contents of the mailbox only after prior authentication

The possibilities of sharing the transmission medium are

■ Time multiplex

■ Wave multiplex

■ Frequency multiplex

○ Cannot share at all

○ Voltage multiplex

Which of the following statements is true about the HTTP protocol?

■ It runs on the TCP transport protocol

■ It is built on the client server architecture

○ It is operated over the UDP transport protocol

○ Used to obtain an IP address when knowing the MAC address

○ Used to report errors and special conditions during packet transmission

○ Used for encrypted web page transmission

A topological database that represents the topology of a given site

○ Invited when using the DVA algorithm for dynamic routing

○ is used by the RIP protocol

■ is used in a dynamic direction to find the shortest routes to individual networks

○ Not used in dynamic routing at all

The server operates two DNS services

and TFTP. How will the server distinguish which type

is one satisfied when the client receives a request?

■ The incoming datagram contains the destination port, which determines which service it is

What is the RTSCTS mechanism used for in IEEE 802.11 networks?

■ To reserve a channel for the intended transmission of the frame

The problem of the hidden node lies in

■ Incomplete mutual audibility of stations

The following cabling is used for Ethernet networks (at least 10 Mbit / s)

□ Supermode optical fiber (supermode)

■ Thin coaxial cable

■ FTP (twisted pair shielded with foil)

□ UTP category 1

■ According to EIA / TIA 568A / B standard

□ According to ISO 88592

The LSA (link state algorithm) method can be said

■ It is an example of dynamic routing

■ Routers know the network topology

□ Routers send a routing table to neighbors

□ Converges slowly

□ It is represented by the RIP routing protocol

■ It is represented by the OSPF routing protocol

TCP header *

■ Contains source and destination port numbers

□ Contains a checksum, which may not be filled in

■ Contains an array of single-bit flags used to control the connection

□ Contains the protocol number carried in the TCP segment

■ Contains the number of the last correctly received octet

□ It is inserted into the frames directly at the beginning of the data field

Switch (SWITCH)

■ Sends an Ethernet frame with the MAC address FF: FF: FF: FF: FF: FF to all interfaces.

■ Selects the interfaces to which the frame will be sent according to the destination MAC address.

□ Routes packets based on the destination IP address

□ Has an IP address assigned to each port

■ Allows you to define virtual LANs (VLANs)

■ It can send frames from different VLANs to another switch using TRUNK ports

The SMTP server is communicating

□ with the POP3 server from which it receives emails

■ with SMTP client (user agent)

□ with both POP3 and IMAP server

■ with another SMTP server.

□ with IMAP server

□ with IMAP client

The following types of modulations are commonly used for data transmission.

■ Amplitude

□ Quantum

■ Frequency

■ Phase

□ Doppler

□ Binary

Methods of nondeterministic approach to channel sharing are:

□ Central control

□ Distributed handover control… ..

■ Aloha

□ Virtual logical circle

■ CSMA / CD method

□ Binary search

The DVA method (distance vector algorithm) can be said:

■ It is an example of dynamic routing

□ Routers know the topology of the entire network

■ Routers provide neighbors with a routing table.

■ converges slowly

■ It is represented by the RIP routing protocol

□ It is represented by the OSPF routing protocol

Router

□ Sends an Ethernet frame with the MAC address FF: FF: FF: FF: FF: FF to all interfaces.

□ Selects the interfaces to which the frame will be sent according to the destination MAC address.

■ Routes packets based on the destination IP address

□ Increases the TTL field of each passing packet by the configured value.

■ Has an assigned IP address on each port.

□ Must have the entire routing table manually defined by the administrator (except for connected networks.)

SMTP server *

■ Receives emails

from the mail client (user agent)

□ Sends emails

mail client (user agent)

□ If there is no mailbox, the recipient sends the client an ICMP Destination Unreachabble message

■ Can establish a TCP connection with other SMTP servers.

■ Receives emails

from another SMTP server.

□ Sends emails

another SMTP server as UDP datagrams.

Network topologies are

■ Bus

■ Star

■ Distributed star (tree)

□ Square

■ Circle

□ Polynomial

Ethernet topologies are

■ Bus

■ Star

■ Distributed star (tree)

□ Square

□ Circle

□ Polynomial

RIP protocol *

■ Runs between routers (ROUTERS)

□ Runs between switches (SWITCHi)

■ Passes a routing table to a neighbor

□ Passes the table of <MAC address, port> pairs to the neighbor

■ Calculates the shortest (cheapest) routes to all networks

□ Prevents loops on the 2nd layer

The following types of name server records have these meanings

□ SOA - Defines all non-authoritative servers for a given domain.

■ NS - specifies the authoritative name server for the given domain

□ MX - specifies WINS server (name server for MS NetBios protocol)

□ A - assigns a domain name to the IP address

■ PTR - assigns a domain name to a special IP address entry

■ CNAME - specifies the alias for the given domain name

In what situations is an ICMP message sent to the sender?

□ If the packet size exceeds 64 KB and fragmentation is disabled.

□ When a packet is lost on a line.

□ If the packet size exceeds the length of the frame data field of a line and fragmentation is enabled

■ If the packet size exceeds the data length of the frame field of some line and frag is disabled.

■ If the router receives a packet with TTL = 1 and forwards it to another router according to the routing table.

□ In response to a DNS query

The following protocols are used to send and receive e-mail

■ SMTP

□ SNMP

■ POP3

■ IMAP

□ FTP

□ BOOTP

Station X receives a TCP segment with the ACK flag set and the following values in the header:

Sequence number: 1000 Acknowledge number: 500 Window: 100

Based on this information, station X may send bytes with sequence numbers

a) 10001 1500

b) 501 - 600

c) 501 - 1000

d) 101-500

e) 101 – 1000

For Distance vector routing protocols, routers send

(a) information on adjacent lines whenever the status changes

(b) the contents of its routing table only if it is changed

c) periodic information on adjacent lines

d) periodically the contents of its routing table

ISOOSI reference model

□ Contains 10 layers

■ Defines the physical parameters of the interface at layer 1

□ Defines the methods of cable welding on the link layer

■ Layer 3 routing between networks

■ Can use sliding window method to transfer Layer 4 data

□ Defines IP as the standard Layer 3 protocol

Serial transmission

□ It is synchronous, asynchronous or antisynchronous.

□ Sends an 8, 16, or 32-bit word in one clock cycle, depending on the implementation

■ In synchronous mode, maintains constant time synchronization of the source and destination.

□ Always uses start bits and stop bits for data transfer.

□ Always resends unconfirmed characters when the timeout expires

■ In synchronous mode, uses wing marks to indicate the boundaries of the data unit

9. Domain Name Service (DNS)

■ Allows you to use domain names with a component length of up to 63 characters

□ Case sensitive (caseensitive)

□ Uses a colon as a name separator for name components

■ Uses both UDP and TCP protocols for communication

□ Performs MAC address to IP address translation

■ Allows IP addresses to be translated into domain names

10. What happens if the router cannot deliver an IP packet?

■ The packet is dropped

□ The router keeps the packet in the buffer until the routing tables are completed.

■ An ICMP error message is sent to the original sender

□ An ICMP error message is sent to the original destination

□ The packet is returned to the previous router.

□ The packet is sent back to the original source.

11. The following protocols are commonly used to download binaries from the Internet

□ SNMP

■ HTTP

■ FTP

■ HTTPS

□ BOOTP

□ DHCP

7. The station can obtain a unique IP address (IPv4) as follows

■ Using DHCP

□ Using the HTTP protocol

■ BOOTP protocol

□ ICMP protocol (IP address request)

□ Using the ARP protocol

□ From the nearest DNS server found via a broadcast message

8. How can the router obtain information about routes to destination networks?

□ The switches inform the surrounding routers that the admin networks have configured in their tables

■ Information is entered statically by the network administrator.

□ Paths are obtained from information collected in ARP tables.

□ Routers and switches forward information about networks they know to each other using routers protocols.

□ The information is sent as a broadcast switch each time a new segment is connected to it networks.

□ Information can be obtained by active ARP queries

How routers can obtain information about possible paths to destination networks

■ Information is entered statically by the administrator

□ Paths are obtained from information collected in ARP tables

□ HUBs (repeaters) inform surrounding routers that the site administrator has configured in their tables

□ The information is sent as a broadcast switch each time a new segment is connected to it site

■ Information is transmitted using routing protocols

□ Information can be obtained by active ARP queries

9. The TCP header contains the following items

■ Bit flag FIN, requesting termination of communication in one direction

□ NAK bit flag indicating that it is a negative acknowledgment

□ NOP bit flag, defining that it is a keepalive packet

■ An RST bit flag that forces the connection to terminate in both directions

■ SYN bit flag used when establishing a connection

■ Field specifying the current width of the receive window

9. The TCP header contains the following items

■ Bit flag FIN, requesting termination of communication in one direction

□ Bit flag of the NAK indicating that it is a negative acknowledgment

□ NOP bit flag, defining that it is a keepalive packet

■ An RST bit flag that forces the connection to terminate in both directions

■ The SYN bit flag, which is used when establishing a connection

■ Field specifying the current width of the receive window

10. Methods of deterministic approach to shared channel are

■ Central control

■ Distributed control by passing credentials

□ ALOHA

■ Virtual logical circle

□ CSMA / CD method

■ Binary search

11. Which of the following statements is true about the HTTP protocol?

■ It is built on the client server architecture

□ Used to obtain an IP address, knowing the MAC address.

□ It is operated over the UDP transport protocol.

□ Used for encrypted web page transmission

□ Used to report errors and special conditions during packet transmission.

■ It runs on the TCP transport protocol.

7. MAC address (globally valid)

■ It is divided into two parts, specifying the manufacturer and the serial number

□ Used to address the target computer on the 3rd layer of the OSI model

□ It is divided into the network address and the end node

□ It consists of four 8-bit numbers

■ It consists of six 8-bit numbers on Ethernet

□ Contains information necessary for packets to be routed by the router

8. Sliding window method *

■ In the GOBACKN variant

requests packet retransmission from the first lost

□ Keeps packets that have not yet been confirmed in the receive window.

■ Uses sent packets on the sending side of the window

□ Always requires sending negative acknowledgments (NAK)

■ After the timeout in the GOBACKN variant

resends all unconfirmed packets

□ It is used for data transmission on the Internet using the UDP protocol

The types of routing are

■ Static (non-adaptive) routing

■ Hierarchical routing

□ Geographic routing

■ Distributed routing

□ Topological routing

■ Dynamic routing

What are the advantages of using static routing over dynamic?

■ less CPU load on the router

■ complete control over the selection of routes used

□ Less configuration effort

□ higher adaptability when changing the topology

■ Higher security than when using the routing protocol

□ can also be used on switches with VLAN support

If you do not have an email client, how can you look into your email inbox?

□ I will ping with the -t MX option and the address of the server where my mailbox is

□ I will use the telnet program and connect to port 25 (SMTP server port)

□ There is no way to read the contents of the e-mail box □

I will use the FTP program and connect to port 110 (POP3 server port)

■ I will use the telnet program and connect to port 110 (POP3 server port)

□ I will use the Mail Download Protocol (MDP) using the mdp command

When tracing a network with the traceroute command

a) the sender gradually increases the TTL field in the IP packet header and receives the ICMP Echo Reply message

b) the sender gradually reduces the TTL field in the IP packet header and receives the ICMP Echo Reply message

c) the sender gradually reduces the TTL field in the IP packet header and receives the ICMP Time message

Exceeded

d) the sender gradually increases the TTL field in the IP packet header and receives the ICMP Time message Exceeded

The channel is shared by the distributed binary search method. In the case of the current

broadcasting different values by multiple stations will be a logical zero on the channel. Stations A, B compete for the channel and C with addresses:

A: 1 1 01010 // from slide 27 here I would say And if there was no specification in the assignment so I agree

B: 1010 0 10 // because it is specified that when sending a different value, 0 is written, it should be B no?

C: 1010101

Determine which bit of the address decides which station will access the channel and which it will.

It compiles fragmented packets according to the Identification, Fragment Offset and

a) source MAC addresses exclusively to the destination station.

b) source MAC addresses of any router on the path.

c) source IP addresses exclusively of the destination station.

d) source IP addresses of any router on the path.

What about MAC addresses 00: BB: BB: BB: 00 and 00: BB: BB: BB: 01?

a) there are two variants of the broadcast address.

b) these are the addresses of stations on the same network segment.

c) they are addresses assigned to the same manufacturer.

d) these are MAC addresses reserved for the ARP protocol function.

It is set in the TCP segment with source address 10.0.1.10 and destination address 10.0.2.20

the RST symptom occurs:

a) Forcible termination of a connection (both sides)

b) One-way termination from 10.0.1.10

c) One-way termination from 10.0.2.20

d) Damage notice

POP3 server

a) It is typically used to send e-mail. mail

b) It is the first server to transmit the message

c) Allows reception of el. mail only after authentication

d) Connects to the DNS server

SMTP server

a) It is typically used to receive electricity. mail

b) As the message passes, it inserts a Received header indicating that the message has passed

c) Allows sending e-mails. mail only after USER and PASS authentication

d) Connects to the DNS server, where it finds out the POP3 domain according to the MX record,

to which he joins and sends him a message

An example of RM OSI layer 7 protocols (full combination)

a) TFTP, HTTP, FTP, ICMP

b) TCP and UDP

c) IP and IPX

d) DNS, HTTP, TFTP

10. In which situations is an ICMP message sent to the sender?

□ If the packet size exceeds 64 KB and fragmentation is disabled.

□ When a packet is lost on a line.

□ If the packet size exceeds the length of the frame data field of a line and fragmentation is enabled.

■ If the packet size exceeds the data length of the frame field of some line and frag is disabled.

■ If the router receives a packet with TTL = 1 and forwards it to another router according to the routing table.

□ In response to a DNS query

TFTP protocol

■ Allows stations to download the OS boot file from the server

□ Provides a subnet mask

□ Requires a username and password for authentication

■ Allows you to upload a file to the server

□ Uses TCP protocol

■ Uses the stop and wait acknowledgment scheme

TFTP protocol

■ It is used for its simplicity to load the OS boot file from the server (network boot)

■ Transfers data from server to client or from client to server

□ Due to data size limitations in the UDP datagram, it can only transfer files up to 64 KB in size

■ Uses the stop and wait algorithm

■ Uses an unencrypted connection

ASDL technology

□ It is suitable for service providers due to high transmission speeds

■ It allows data to be transmitted over distances of the order of km on a conventional telephone network line

□ Has asymmetric baud rates faster to provider slower reverse

■ Adjusts the actual speed to the line quality

□ Excludes the simultaneous use of an analog telephone

■ Uses a splitter to split the band

Ethernet networks are according to the IEEE 802.3 standard

■ 10Base2 - Ethernet networks on a thin coax cable type RG58

□ 100BaseSX - full duplex transmission over 1 metal wire

■ 10BaseT and 100BaseT - metallic twisted pair networks

□ 100BaseFX - optical paths 10Mbit / s

□ 10BaseGLX - transmission over a classic telephone double line

□ 10GBaseT - 10000 Mbps full duplex optical network

ICMP IPv4 can be used to

□ Assigning a MAC address to an IP address (address resultion)

□ Redirect traffic for one network to another gateway

■ PC availability check (echo request)

■ Destination unreachable information

■ Time exceeded information

□ Information on the number of packets dropped by the router (router drop rate)

FTP protocol

□ UDP data

□ ICMP data

■ TCP data

□ UDP control

□ ICMP control

■ TCP control

Using ISDN for data transmission over the BRI connection gives these possibilities

□ Data channel with a transmission speed of up to 2Mbps

■ Establishing a connection within approx. 1 second

□ Higher baud rate in the direction of the terminal (downstream) than in the direction of the network (upstream)

□ Possibility of bundling up to 16 channels

■ Possibility of slow transmission on channel D if supported by the ISDN network operator

□ Simultaneous use of an analog telephone on the same line

Virtual private networks

□ There are VLAN-based networks that use private IP addresses

■ They use a shared public infrastructure

□ Can be implemented on 3 layers using SSL

■ Can be implemented on 3 layers using IPSec

□ In principle, they do not allow the operation of protocols other than IP

□ They are more expensive to build and manage than private infrastructure

NAT translation

□ When using static NAT, static routing must be used on the internal network

□ NAT allows stations without IP support to communicate with the Internet

■ Increases security by hiding the internal structure of the network

□ Increases the security of the external network against attacks

■ When using pure dynamic NAT, servers accessible from the Internet cannot be operated on the internal network

□ Private IP addresses must be used in the internal network behind NAT, otherwise it will not work

Protocol for services www

□ In HTTP version 1.0 multiple documents in 1 connection

■ In HTTP 1.1, multiple documents in 1 connection

□ In HTTP version 1.0 encrypts data

□ Encrypts data in HTTP version 1.1

■ HTTPS is required to encrypt data in both 1.0 and 1.1

□ Enables the transfer of binary data from version 1.1

Stateless filtration

■ Each UDP packet

■ Each TCP packet

■ Each IP packet

UDP protocol

■ Contains source and destination port numbers

■ Contains a CRC that may not be filled

The transmission medium can be shared

■ Frequency multiplexing

■ Time division multiplexing

■ Wave multiplex

encrypted

■ Ensure the integrity of data transmission that has not been altered

■ Symmetric encryption tends to be faster than private and public keys

The IP address is

□ It is divided into two parts, specifying the manufacturer and the serial number

■ Used to address the target computer on the 3rd layer of the OSI model

■ It is divided into a part of the network address and a part of the end node address

■ It consists of 4 8-bit numbers

□ It consists of 6 8-bit numbers on Ethernet

□ Contains information necessary for packet routing by the switch

Spanning Tree

□ Runs between routers

■ Runs between switches

□ Passes a routing table to a neighbor

□ Passes a table of pairs (MAC address, port) to a neighbor

■ Calculates the shortest (cheapest) paths to a tree root

■ Prevents layer 2 loops

IP (IPv4) header

■ Contains the source and destination addresses

□ Contains source and destination port numbers

□ Contains the source flag FF (force fragments), forcing fragmentation

■ Contains a checksum

■ Contains a TTL (time to live) field, at which the packet is dropped

■ Can be of variable length

How can we characterize an asymmetric cryptographic system?

■ Uses two keys as an interrelated pair

□ Encrypts data on the source with two keys for greater security

□ Uses one shared key

□ Uses DES, 3DES or AES algorithms

■ Uses one key for encryption and the other for decryption

□ Uses efficient algorithms that are not computationally intensive and easy to implement

Hardware

Comparison of DVA and LSA routing algorithms

■ TWO is easier to implement and less computationally intensive than LSA

□ LSA converges significantly longer than TWO

■ In the case of DVA algorithms, routing information propagates between routers at specified times

intervals (eg 30s) In the case of LSAs, they are spread only when they change

■ LSAs compile a routing table based on knowledge of the network topology, TWO algorithms compile a routing table

table based on the routing tables of other mixers.

□ Both TWO and LSA algorithms use the same type of metric, so there is always a number of mixers between source and destination

■ LSA routing algorithms are more suitable for large networks due to fast convergence, stability

Which of the following protocols can be disabled using ACLs without compromising functionality

sending and receiving electric mail?

□ POP3

□ SMTP

■ ICMP

■ FTP

□ DNS

■ TFTP

User Datagram Protocol (UDP)

□ It is a second layer protocol

□ always ensures reliable network data transmission

■ is used when transmitting data by an unacknowledged data service

■ contains a checksum field in the header

□ contains the source and destination port number in the header. However, these items are optional and may not be

used

□ used only for audio transmission in IP networks.

What is the largest distance between two active elements in 100BaseT Ethernet according to the standard,

when do I use UTP5 cables?

a) 82 meters

b) 100 meters

c) 185 meters

d) 300 meters

e) 305 meters

The Spanning Tree protocol is used to

a) find the shortest paths from each switch to each network segment

b) blocking the connections forming loops between the switches

c) find the shortest routes from each router to each network segment

d) blocking loop connections between routers

e) blocking the joints having the longest path to the root of the tree

Which of the following terms indicates the time between the sending of a packet by the sender and its receipt

the recipient?

a) bandwidth

b) delay

c) timetolive

(TTL)

d) checksum

e) scatter (jitter)

Metrics in DVA (Distance Vector Algorithm)

□ is a number that represents the quality of the line to the neighboring router

■ is a number that indicates the number of hops on the way from source to destination

□ specifies the number of IP address bits that are used for network addressing

■ is usually limited to the maximum value above which routing information is considered

invalid

■ varies depending on the number of routers in the selected network path

□ is completely independent of the number of routers in the selected network path

Protocols 7. OSI model layers are (all in variant)

a) FTP, TFTP and HTTP

b) TCP and UDP

c) IP and IPX

d) DNS, ARP, DHCP and BOOTP

e) TCP, UDP and IP

Which network security claims are valid?

□ In practice, encryption is implemented exclusively on the presentation layer

□ The SSL layer provides encryption on the 2nd layer of OSI RM

■ IPSec provides OSI RM Layer 3 encryption

□ Encryption on the 2nd layer of OSI RM is the most effective for encrypting Internet traffic

■ Encryption can be technically implemented on multiple layers of OSI RM at the same time

■ With asymmetric encryption, you can encrypt with a private key and decrypt with a public key or vice versa

The server operates two services - HTTP and FTP. How does the server distinguish which type

is the connection at the moment it registers the connection attempt?

c) The incoming segment contains the destination port, which determines which service it is.

Add: ARP protocol is used

to obtain a Layer 2 address based on the known OSIRM Layer 3 address

An ARP request is sent from the station with the MAC address 01: 23: 45: 67: 89: AB and the IP address 1.2.3.4/24

to determine the address of the 2nd layer of OSIRM

station with IP 1.2.3.2, whose address is 0A: BC: DE: F1: 23: 45.

The request frame will be sent to the destination c) MAC address FF: FF: FF: FF: FF: FF

The routing table must always contain the following columns:

■ The IP address of the network destination station, which the given table row represents

□ The IP address of the computer that sent the address

□ A metric that always represents the number of routers on the way to the destination

■ The interface through which the packet will be sent or the IP address of the neighbor to whom the packet will be sent

□ A list of protocols that the network supports

□ TCP ports that can be used in the destination port field in the TCP header

Compared to TCP and UDP protocols

□ TCP burdens the network far less than UDP when transmitting small amounts

■ Unlike UDP, TCP is able to ensure that data is always transmitted to the recipient

delivered without any errors caused by their network transmission.

□ UDP has a much longer header than TCP

■ Both protocols use 16-bit numbers carried in to identify the source and destination ports

their headers.

■ UDP can have a broadcast or multicast address as the destination address.

TCP does not allow this.

□ The header of both protocols is the same, but it provides network services

NAT

□ Means Network Access Tunnel

□ Used for secure remote connection to the corporate network

■ This is IP address translation

■ Allows you to change the destination port in the TCP segment

■ Allows you to change the source port in the TCP segment

□ Encrypts data in the transparent layer of the OSI model

Broadband translation

■ allows you to transmit multiple channels with a single transmission medium

□ enables transmission but at the cost of worsening the use of the transmission medium

□ means the use of another transmission medium not defined

□ Used mainly in LAN networks with Ethernet technology

□ It always uses more bandwidth than baseband transmission

□ Used mainly for data transmissions in current LANs

TFTP protocol

■ Uses UDP on Layer 4

■ It is used for its simplicity to load the file to start the OS from the server (network boost)

□ Due to the data size limit in the UDP datagram, it can only transfer files up to 64KB in size

□ Uses sliding window

□ Transfers data only from the server to the client

□ Uses an encrypted connection

Which statements are true about DHCP

It is a protocol for dynamically assigning MAC addresses to clients

■ It is built on a client-server architecture

Used to check the availability of the target computer

used to block loops between switches

■ It is a protocol for (temporary) assignment of IP addresses and other parameters…

This is a protocol for selecting the contents of mailboxes

The following applies to the NTP protocol:

□ Works with local times and time zones

■ Supports hierarchical organization of NTP servers

■ It is designed to synchronize times in the network with a variable portable delay

□ It is intended for time synchronization only in a network with a constant transmission delay

□ Applicable only on synchronous WAN links

When establishing a TCP connection:

□ Before opening a bidirectional logical channel, its parameters are always negotiated with

UDP protocol

□ It is necessary to agree on the initial sequence numbers used to confirm the transmitted data for both

directions independently

■ In the first tcp segment that initiates communication, only the SYN flag in its header is set

□ The line quality is first tested using a TCP segment with the QOS flag set in its header

■ The initial sequence numbers that are used to acknowledge the received data are generated randomly

□ It is necessary that the source and destination port numbers are the same

We run dynamic routing based on the DVA algorithm over the given topology. In a given topology they are

all its parts are mutually achievable. What restrictions apply to a given network, if we understand the number by distance

jumps?

■ The maximum distance between routers in a network is always limited to a value that is given by the maximum size

metrics considered valid by the routing protocol

□ The maximum number of routers in the network is limited by how the routing protocol represents in its messages

metric value

□ The maximum distance between routers in the network is not limited

□ The maximum number of routers in the network is always limited to a value that is given by the maximum size of the metric

considered valid by the routing protocol

□ The maximum distance between routers in a network is equal to half the number of routers in that network

■ The maximum number of routers in a network is not limited by the routing protocol (unless the size is technically limited

routing tables)

Address Translation (NAT) has the following features

□ Private IP addresses must always be used in the internal network behind NAT, otherwise NAT will not work

□ When using static (destination) NAT, static routing must be used on the internal network

■ It can map internal network addresses to several addresses from the external network

□ When using static (destination) NAT, servers accessible from the Internet cannot be operated on the internal network

□ NAT allows stations without IP support to communicate with the Internet

■ Slightly increases security by hiding the internal structure of the network

The IEEE 802.11i standard defines

□ Radio layer for transmission via infrared light

■ Security mechanisms for wireless networks

□ AES standard as an acknowledgment scheme for frame transfer

□ Radio layer for FHSS transmission

□ Radio layer for DSSS transmission

□ Conditions of network operation in the 5GHz band

The Spanning tree protocol can run

□ switches and routers together for each VLAN

□ Hubs and switches together for each VLAN

■ switches for each VLAN

□ Hubs and switches separately for each VLAN

□ switches and mixers separately for each VLAN

The DNS lookup can be performed as follows

□ When querying for a name that is not under the management of the interviewed NS, the NS will try to answer from a randomly selected DNS

server

■ When querying a name that is not managed by the NS being queried, the NS may reject the query

■ When querying for a name that is not managed by the NS being queried, the NS can use recursive search and return

non-authoritative answer

■ Search in the DNS database is performed by the client's SW (resolver) or recursive DNS server

■ If the DNS server being queried is authoritative for the name being queried, that server responds directly.

■ The client may have an IP address assignment to some domain names preconfigured statically. In this

In this case, the DNS server does not contact at all.

Asynchronous (arrhythmic) serial transmission:

□ means that a different baud rate is defined for each direction

□ requires a line for a clock signal

□ requires only start bit

□ maintains a constant clock synchronization between the transmitter and receiver

■ needs start / stop bits

■ Transmits data character by character

The longest usable subnet mask when subnetting is

a) 255.255.255.252

b) 255.255.255.255

c) 255.255.255.250

d) 255.255.255.248

e) 255.255.255.254

Stateless operation filtration has the following characteristics

□ Each TCP protocol packet is checked against other packets of the same connection

□ For TCP connections, it is not possible to distinguish whether this is the first packet of the connection

■ Each UDP protocol packet is checked without binding to other packets

□ It does not allow you to distinguish between different types of ICMP messages

□ It is poorly scalable because its effectiveness depends on the number of TCP connections passing through the router

filtration

■ Each IP protocol packet is scanned without binding to other packets

Examples of OSI model layer 3 protocols are (all protocols in the variant)

a) FTP, TFTP, HTTP

b) IP, TCP, UDP

c) IP

d) IP, ARP, DHCP

e) TCP and UDP

In which types of Ethernet a collision may occur

□ 100BaseT full duplex

■ 10Base2

□ 10BaseT full duplex

■ 100BaseT half duplex

□ 10GBaseT

■ 10Base5

What activities must the spanning tree perform for proper functionality

□ Each device calculates a tree of the shortest paths to all other devices (and their connected networks) using

Dijkstra's Algorithm

□ Forces the router to exchange its routing tables with its neighbors, the router will find out from this information

network topology and knows which interface to block

■ Every 2 seconds, root generates a message that spreads down the tree

□ Each router monitors the status and functionality of the lines connected to it and immediately disseminates information to everyone when it changes

other routers

■ Creating a tree of the shortest (cheapest) paths from the root to each bridge (respectively switch)

■ First, choose the root of the tree. The selection is made according to the configured priorities and in case of a match according to

unique fixed Bridge ID