TECNOLOGIE E SERVIZI DI RETE

Domande in inglese

1. Given a network based on several physical networks interconnected by routers and a range of IP addresses to use in that network, it is possible to define an addressing plan that optimizes routing on a given router of the network by

a) Assigning to the various physical networks distinct network IDs randomly selected within the address range given for the entire network

b) Splitting the network in areas and defining, within the given address range, smaller distinct address ranges to use in each area

c) Assigning to the various physical networks distinct network IDs selected within the address range given for the entire network. In particular, this assignment must proceed from in a decreasing order of network size

2. A consequence of the deployment of VLANs in a local area network is:
   a. The network security increases as frames are encrypted
   b. The creation on virtual interfaces on switches, which, since virtual, cannot have failures
   c. Users must be authenticated before connecting to the VLAN
   d. The broadcast traffic is bounded to the VLAN where it has been generated

3. Which type of cloud Delivery Model has major control and responsibility over its configuration and utilization?
   a. Security-as-a-Service
   b. Infrastructure-as-a-Service (IaaS)
   c. Software-as-a-Service (SaaS)
   d. Platform-as-a-Service (PaaS)

4. The Interface ID of an ipv6 address
   a. Is assigned by the network administstrator according to a hierarchical schema
   b. Can be arbitrary selected. sometimes It is derived from the MAC address of the Interface
   c. Is assiqned by the ISP according to a hierarchical schema
   d. is the same for all devices with the same link

5. The Frequency Reuse in a cellular network refers to
   a. The reuse of frequencies usually adopted for other services (for example, TV broadcasting)
   b. The reuse of the same frequency to send consecutive text messages (SMS)
   c. The reuse of the same frequency for all the phone calls made by a terminal
   d. The reuse of the same frequency in different cells that are sufficiently distant

6. OSPF-TE and ISIS-TE include enhancements to traditional routing protocols OSPF and ISIS that have been standardized jn the context of MPLS in order to
   a. Include adequate fields in routing messages to support explicit routing
   b. Allow the independence of control plane and data plane in MPLS routers. which ultimately enables traffic engineering

c. Enable the distribution of additional information (named constrained data) in support of constraint based routing
d. Ensure faster convergence and enhanced stability

7. When an MPLS frame has multiple labels. Routers
   a. Only process the most external label to decide how to forward the frame
   b. Only process the most Internal label to decide how to forward the frame
   c. Only can swap the most external and the next label With each other
   d. Can swap any of the labels
8. The IPv6 Aggregatable Global Unicast addresses are
   a. Aggregable only in very small address ranges. in order to favor the precision of the evaluation of routing paths
   b. Globally unique. substantially equivalent to the IPv4 public addresses
   c. Usable only on devtces belonging to the same local area network
   d. Usable in a global IPv6 network only With proper Network Address Translation (NAT) techniques

9. The Timing Advance in the GSM is
   a. The capability of a mobile terminal to operate in different time zones
   b. The beginning of the transmission at a mobile terminal *before* the beginning of its assigned time-slot
   c. The beginning of the transmission at a mobile terminal *after* the beginning of its assigned time-slot
   d. The beginning of the transmission at a mobile terminal before the creation of the Stand-alone Dedicated Control CHannel(SDCCH)

10. indicate the false claim among the below statements about SSL (Secure Socket Layer)-based VPNs (Virtual Pnvate Networks)
    a. They can use tunnels over TCP or UDP
    b. They operate in kernel space
    c. No Standard solutions are available
    d. They are weak against DOS attacks

11. What did it contribute to slow down tho spread of IPv60
    a. The recall and a more careful reallocation of all the IPv4 addresses already in use
    b. A more careful utilization of the Internet network by final users
    c. The possibility to use pnvate IPv4 addresses for the Internet access
    d. The decrease of the number of connected devices

12. Virtual LANs (VLANs) are
    a. Networks that are able to emulate on a given LAN the presence of a remote device, usually created by means of tunneling techniques
    b. Networks created only among Virtual Machines (VMs)
    c. Virtually distinct local area networks but created over a single physical infrastructure
    d. Very high performance wireless networks

13. In the fully operational OSPF protocol, all routers have in memory:
    a. The same tree of optimal routes
    b. The database describing the area to which they belong
    c. The same database describing the entire AS
    d. A Distance Vector set of all neighboring routers

14. Filtering table of a VLAN:
    a. It can only be updated manually
    b. It can be updated manually or automatically with appropriate protocols
    c. Contains only local network Ips

15. The Frequency Reuse in a cellular network refers to
    a. The reuse of frequencies usually adopted for other services (for example, TV broadcasting)
    b. The reuse of the same frequency to send consecutive text messages (SMS)
    c. The reuse of the same frequency for all the phone calls made by a terminal
    d. The reuse of the same frequency in different cells that are sufficiently distant

16. When an IP router with complete multicast service support receives a packet related to a given multicast group
    a. Discards the packet because it's not possible to offer multicast services over an IP network
    b. Sends out a copy of the packets on all the ports
    c. Sends out a copy of the packet on all the ports. except the one through which the packet received
    d. Sends out a copy of the packet on all the ports useful to reach the destinations belonging to the multicast

17. The configuration of a switch port in access mode is used for
    a. Allowing the access to the switch only to specific flows that are not considered matchous
    b. Enabling the access to the network
    c. Assigning a packet received on that port to a specific VLAN
    d. Assigning a packet sent through that port to a specific VLAN

18. The basic ideal of MPLS (Multi-Protocol Label Switching) consists in
    a. Inserting a label in IP packets so that network nodes can use it to determine the path the packet must follow B: Inserting a label layer two frames so that network nodes can use it to identify the various higher-layer protocols (multi-protocol) encapsulated in the frame
    b. Association a label to each packet so that the destination can identify the data flow the packet belongs to. Independently of the protocol being used (multi- protocol)
    c. Associating a label to each packet so that network nodes can use it to determine how to process such packet

19. An ARP Request that a host with IP address 130.192.10.1/24 sends to learn the MAC address of a host with IP address 130.192.10.200
    a. Arrives at the destination if the two hosts are connected by means of an Ethernet switch, ignoring possible failures of links and devices involved
    b. Never arrives at the destination
    c. Actually, the ARP Request is not sent because the destination host is outside the IP network of the source D: Always arrives at the destination, ignoring possible failures of links and devices involved

20.A network interface with both an IPv4 and an IPv6 address can receive:
a. Both IPv4 and IPv6 packets
b. Only IPv4 packets encapsulated in IPv6, according to the approach called "tunneling"
c. Only IPv6 packets, since in such kind of configuration the operating system considers IPv4 as obsolete
d. Only IPv6 packets encapsulated in IPv4, according to the approach called "tunneling"

21.Which of the following choices is not an Adaptive Routing algorithm?
a. Selective Flooding
b. Isolated Routing
c. Link State
d. Centralized Routing

22.The Duplicate Address Detection (DAD) procedure
a. Is used in IPv6 In order to check that a host could also acquire an IPv4 address
b. Is used in IPv6 in order to check that the MAC address selected for a host is not already in use
c. Is used in IPv4 in order to check that a host could also acquire an IPv6 address
d. Is used in IPv6 in order to check that the IPv6 address selected for a host is not already in use

23.The term handover in cellular networks refers to
a. The movement of a mobile terminal from a cell to another, even if in that moment there are no active communications
b. The movement of a mobile terminal from a cell to another without the interruption of an active communication (eg. a call)
c. The use of a mobile terminal in the network of a different operator with respect to the one the SIM card installed in the terminal belongs to
d. The turn-on of the mobile terminal after a long period of inactivity

24.In IEEE 802.11 networks, the -hidden terminal problem- refers to
a. the possibility that two or more wireless nodes can interfere with each other without knowing it
b. a security threat caused by an Intruder in the BSS
c. a failure in the association to an Access Pont during the passive scanning procedure
d. the use of the same MAC address by more than one node to the same BSS

25.OSPF-TE and ISIS-TE include enhancements to traditional routing protocols OSPF and ISIS that have been standardized in the context of MPLS in order to
a. Include adeguate fields in routing messages to support explicit routing.
b. Allow the independence of control plane and data plane in MPLS routers, which ultimately enables traffic engineering
c. Enable the distribution of additional information (named constrained data) in support of constraint based routing
d. Ensure faster convergence and enhanced stability.

26.In the LTE core network, packets are routed to/from the Access network by:

a. The Mobility Management Entity (MME)
b. The eNodeB
c. The Packet Data Network Gateway (PGW)
d. The Serving Gateway (SGW)

27. The Timing Advance in the GSM is
a. The capability of a mobile terminal to operate in different time zones
b. The beginning of the transmission at a mobile terminal after the beginning of its assigned time-slot
c. The beginning of the transmission at a mobile terminal before the beginning of its assigned time-slot
d. The beginning of the transmission at a mobile terminal before the creation of the Stand-alone Dedicated Control Channel (SDCCH)

28. when a MPLS frame has multiple labels, routers:
a. only can swap the next external and the next label to each other
b. only process the next internal label to decide how to forward the frame
c. can swap any of the labels
d. only process the next eternal label to decide how to forward the frame

29. The entries of the filtering database of an Ethernet switch
a. Have a lifetime, which varies over time, depending on the number of received frames
b. Have all an infinite lifetime
c. Have a lifetime, which is always less than 1 second in order to properly manage device mobility
d. Have a lifetime, which generally can be set by the switch administrator

30. The Layer 3 VPN (virtual private network) solutions based on MPLS are characterized by
a. A good level of automation and integration between the public backbone and private networks
b. Particularly high security thanks to the deployment of cryptographic techniques
c. A mix of Layer 2 and Layer 3 tunnelling mechanisms
d. Layer 3 tunneling mechanisms, namely within IP packets

31. VPNs (virtual private networks) are used to
a. Divide a corporate local area network in a set of separate subnets, each for a different corporate function (e.g., sales, procurement, engineering, marketing)
b. Transport private traffic through a shared infrastructure while creating the same conditions the traffic would undergo through a private infrastructure
c. Partition a private network (for example the one of a parent company with various subsidiaries) in multiple networks virtually separated

32. One of the protocols used in MPLS for label distribution is:
a. L2TP
b. OSPF
c. IS-IS
d. BGP

33. An Autonomous System:
    a. is identified by means of a 4 bytes long ID assigned by the CSA
    b. is a set of subnets with a short topological proximity and managed by a single organization unit
    c. is a subnet configured by leveraging the static routing
    d. is identified by means of a 4 bytes long ID automatically computed by the BGP

34. In MPLS (unlike in IP) support for scalable traffic engineering is specifically enabled by
    a. The availability of efficient label distribution protocols
    b. The deployment of a unified control plane
    c. The deployment of dynamic and distributed routing protocols
    d. The forwarding information in the data plane (e.g., the forwarding table) not being automatically updated when the routing information (e.g., The routing table) changes in the control plane

35. Select the correct response
    a. End to end VPN is always better than site to site VPN
    b. Firewall and IDS cannot be placed inside a network protected by a VPN gateway
    c. Skewed channel is a type of IPsec tunnel
    d. None of the options

36. Two stations A and B are interconnected via an Ethernet switch S. The MAC address of the network card of S to which station A is connected is used as the destination MAC address in an ethernet frame
    a. Sent from B to A
    b. Sent from To to a destination outside the network
    c. Sent from A to S, for example for management or configuration purposes
    d. Sent from A to B

37. One of the reasons that are favoring the spread of the IPv6 protocol is
    a. The more and more widespread need to use multicast applications
    b. The low inclination of network operators to modify the configuration of their own networks
    c. The possible inefficiency of the private IPv4 addressing
    d. The lack of MAC addresses

38. When an IPv6 host needs to learn the MAC address associated to a given IPv6 address
    a. It can send a specific ICMPv6 message in multicast over the network
    b. It can send a specific ICMPv6 message in unicast over the network
    c. It can send an ARP Request in broadcast over the network
    d. It can send a specific ICMPv6 message in broadcast over the network

39. The IPv6 Extension Headers are
    a. Header chains that can be added to the main IPv6 header in order to move to the network layer some features that are typically of the transport layer (e.g., the transmission of acknowledges)
    b. Padding techniques adopted to make the IPv6 packet of fixed size equal to 40 bytes

c. Header chains that can be added to the main IPv6 header in order to offer additional features
d. Padding techniques adopted to fix the size of the layer 2 frame containing the IPv6 packet

40. A host A with IP address 130.192.225.79/24 sends an ARP Request on the local network in order to learn the MAC address of a host with IP address 130.192.225.1/26. The corresponding ARP Reply sent from B
a. Is sent to the MAC address of B's default gateway, because A is outside the IP network of B
b. Is not sent
c. Arrives to A only if the network is based on a shared medium (e.g., a Ethernet hub)
d. Is sent to the MAC address of A

41. An IPSec-based VPN (Virtual Private Network)
a. Requires that the end points support the IPSec protocol
b. Requires that the involved Gateway supports the IPsec protocol
c. Deploys tunneling to allow encryption and/or authentication of IP packets exchanged by corporate hosts
d. The encryption is mandatory, while the authentication is optional

42. When the link between two MPLS routers deploys a layer 2 protocol that supports virtual connections (such as ATM and Frame Relay)
a. Routing protocols specified for the given layer 2 protocol must be deployed (for example, a routing protocol of the ATM standard).
b. Labels can be bound only to FECs that include layer 2 destination identifiers (e.g., ATM addresses)
c. It is not possible to use more than one label for each packet
d. The most external MPLS label is carried inside the layer 2 header

43. SSL-based VPN (Virtual Private Network) solutions are widely deployed because
a. They do not have any problems when packets go through a NAT (Network Address Translation) function on their path to their destination
b. They are the only VPN solutions providing a robust packet encryption and authentication functionality.
c. Allow packets to be encrypted and authenticated without the need of negotiating cryptographic keys
d. Allow the layer 3 (network layer) header to be encrypted and authenticated.

44. LSP (Label Switched Path) setup in MPLS (Multi-Protocol Label Switching) implies that
a. Routers connected at the ends of a link share which label should be prepended to packets belonging to the LSP
b. The hosts sending and receiving packets belonging to the LSP support MPLS
c. Routers at the two ends of the LSP (Label Edge Routers) directly exchange routing information
d. The upstream router on a link communicates to the downstream router which label should be prepended to packets belonging to the LSP.

45. The Random Access CHannel (RACH) in a GSM network is used

a. By mobile terminals for sending voice samples by means of a Slotted-Aloha technique for the medium access
b. By the network, for offering dedicated communication channels to mobile terminals
c. By mobile terminals, for requesting dedicated communication channels to the network
d. By mobile terminals for sending voice samples by means of a CSMA technique for the medium access

46. The application of Frequency Hopping (FH) in a GSM network results in
a. An increase of the maximum number of users the cell can serve, but with a reduction of the communication quality
b. A reduction of both the communication quality and the maximum number of users the cell can serve
c. An increase of the communication quality, but with a reduction of the maximum number of users the cell can serve
d. An increase of both the communication quality and the maximum number of users the cell can serve

47. In the 6PE solution packets traveling through the MPLS backbone have two labels;
a. The internal label is used by internal (P) routers to forward packets towards an IPv6 destination.
b. The external label is used by internal (P) routers to forward packets towards an IPv6 destination
c. The internal label is used by internal (P) routers to forward packets towards a PE router.
d. The external label is used by internal (P) routers to forward packets towards a PE router.

48. When an IPv6 host needs to learn the MAC address associated to a given IPv6 address
a. It can send a specific ICMPv6 message in multicast over the network
b. It can send a specific ICMPv6 message in unicast over the network
c. It can send an ARP Request in broadcast over the network
d. It can send a specific ICMPv6 message in broadcast over the network

49. One of the main strengths of the IPv6 protocol is
a. The possibility to use 10Gb/s channels, a feature not available in IPv4
b. The possibility to enable a routing mechanism based on names and no longer on addresses
c. The large size of the addressing space
d. The encryption of the packet payload, available by default for all the packets sent by a host

50. The paging procedure in a cellular network is used for
a. Notifying the mobile terminal that it has to be contacted
b. Notifying the mobile terminal that it is going to change the cell
c. Forcing the mobile terminal to apply proper memory sharing policies
d. Sending an SMS

51. The IGMP protocol

a. Allows a host to communicate to other hosts belonging to a given multicast group its own interest in entering the group
b. Allows a router to communicate to other routers in the Internet network its own interest in receiving the traffic related to a given multicast group
c. Carries the multicast traffic generated by hosts
d. Allows a host to communicate to routers in the network its own interest in receiving the traffic related to a given multicast group

52. With respect to previous solutions, The Long Term Evolution (LTE) technology is characterized, among the other things, by
a. The usage of switching technique based on virtual circuits
b. The usage of a circuit switching technique
c. The usage of mobile terminals that are able to use the IP protocol for sending data
d. The usage of an "all-IP" network architecture with shared communication channels

53. The Integrated Services (IntServ) solution has been standardized to
a. Allow applications to request to and receive from the network the quality of service they need
b. Mark packets as belonging to a specific class of service so that they can receive the most suitable service.
c. Integrate within the network traditional IP routers and MPLS (Multi-Protocol Label Switching) Label Switch Routers (LSRs), thanks to the common deployment of RSVP (Resource ReSerVation Protocol).
d. Enable the integrated deployment of IP routers and Ethernet switches to guarantee network connectivity.

54. Among the four proposed alternatives, which is the smallest valid aggregation that can represent the IP networks 130.192.1.0/24 and 130.192.2.0/24 in a routing table?
a. 130.192.1.0/23
b. 0.0.0.0/0
c. 130.192.1.0/23
d. 130.192.0.0/23

55. The static routing
a. It is an obsolete technology no longer deployed since dynamic routing is preferred over it
b. Consists in one network node computing routes for other network nodes and providing the computed routes to them
c. Consists in the automatic learning of routes without exchanging routing information
d. Consists in the network administrator manually configuring routing information in each router

56. In order to setup a label switched path (LSP)
a. MPLS routers on the path must perform a mapping operation
b. The same layer-two protocol must be deployed on all links on the path
c. Final destinations of IP packets traveling on the LSP must support MPLS
d. MPLS routers on the path must deploy the same protocol for label distribution

57. The difference between link state and distance vector routing algorithms can be summarized as follows
    a. Link state algorithms send local information only to neighboring nodes; distance vector algorithms send global information to all nodes in the network
    b. Link state algorithms send global information to all nodes in the network; distance vector algorithms send local information only to neighboring nodes
    c. Link state algorithms send local information to all nodes in the network; distance vector algorithms send global information only to neighboring nodes

58. The Integrated IS-IS protocol
    a. Is a protocol used by Ethernet switches to create a routing tree in the network (spanning tree) removing closed paths (i.e., loops)
    b. Is a protocol based on the link state routing algorithm widely used in large networks
    c. Is an obsolete routing protocol no longer used due to its low performance
    d. Is a protocol derived as an evolution of BGP for the exchange of information between routers belonging to different autonomous systems

59. Which of these techniques is not a solution for the IPv4-IPv6 transition?
    a. 6mix4
    b. Teredo
    c. 6to4
    d. 6over4

60. The IPv6 address FE80::0201:06FF:FEA5:3A4C is:
    a. An address currently not available in IPv6
    b. An address that can be used on a host with MAC address 00:01:06:A5:3A:4C for communicating with another host on the same link
    c. An address that can be used by more than one device on the same link
    d. An address that can be used on a server with MAC address 00:01:06:A5:3A:4C to offer a service on the public IPv6 Internet

61. RIP is characterized by
    a. The suitability to both interdomain and intradomain routing
    b. The possibility to operate on large networks thank to its capability to function in a hierarchical way
    c. Frequent instability and inclination to create circular forwarding paths (i.e., routing loops)
    d. The usage of a link state routing algorithm

62. The ICMPv6 Router Advertisement packet
    a. Enables device autoconfiguration without a DHCP protocol intervention
    b. Is sent as a reply to an ICMPv6 Neighbor Solicitation packet
    c. Is a broadcast packet
    d. Is sent periodically by a router to all the other routers of the Internet network

63. The Interface ID of an IPv6 address
    a. Is the same for all devices within the same link

b. Can be arbitrarily selected, sometimes it is derived from the MAC address of the interface
c. Is assigned by the ISP according to a hierarchical schema
d. Is assigned by the network administrator according to a hierarchical schema

64. The main contribution to the latency experienced in the nodes of a heavily loaded packet network is given by
a. The time needed to process the packet.
b. The time taken to transmit the packet on an output link (transmission delay)
c. The time taken to locate, in the routing table or in the forwarding table, the information need to forward the packet
d. The time spent in buffers while waiting for resources occupied by other packets to become available (for example, the transmission capacity of a link).

65. A device equipped with the NAT64 functionality is able to
a. Operate on 64-bit ip address
b. Replace the Ipv6 header of a packet with an ipv4 one, and vice versa
c. convert an IPv6 packet in an ethernet frame
d. Replace the IPv6 destination address in the IPv6 header of a packet with an IPv4 one, and vice versa

66. The Mapping Address and Port (MAP) technique for the IPv4-IPv6 transition is based on
a. The utilization, on the Customer Premises Equipment (CPE), of an IPv6 address derived from the IPv4 address and the Port Set ID assigned by the provider to the customer
b. The utilization, on the Border Relay, of an IPv6 address derived from the IPv4 address and the Port Set ID assigned by the provider to the various customers
c. The utilization, on the Customer Premises Equipment (CPE), of an IPv6 address selected among a fixed set of addresses defined by a standard
d. The utilization, on the Customer Premises Equipment (CPE), of an IPv6 address which varies on the basis of the IPv4 destination address that the user would like to reach

67. Indicate the false claim among the below statements about the Link State algorithm
a. The Link State algorithm converges faster than the Distance Vector algorithm
b. The RIP (Routing Information Protocol) protocol is based on the Link State algorithm
c. The Link State algorithm seldom generates loops
d. The Link State algorithm exchanges less information than the Distance Vector algorithm.

68. One of the main properties of the new 5G infrastructure is
a. the use of virtualization techniques on mobile terminals in order to properly support novel applications
b. the come back to the secret switching technology in order to guarantee a proper quality of service which is key in a new generation mobile network

c. the use of software emulators and simulators for the design of the mobile operators' network infrastructures which for this reason are usually referred to as software defined networks
d. the joint use of virtualization techniques and flexible solutions for the network control, with the aim of dividing available network resources in an efficient and effective way

69. Centralized routing
a. Mandates that network nodes do not exchange routing information
b. Mandates that traffic traverses a specific network node
c. Is an obsolete solution that is never used in modern networks
d. Consists in one network node computing routes for other network nodes and providing the computed routes to them

70. What is a main function of NSS(Network Switching Subsystem)?
a. Paging
b. Authentication
c. Resource allocation

71. fixing cell size G and DECREASING radius R
a. capacity increase
b. capacity decrease
c. capacity remains same

72. LTE uses which channel access?
a. fdma
b. cdma
c. ofdma
d. tdma

73. What is the typical role of IPSec in VPNs?
a. To distribute in a secure way the key required by other protocols to open a tunnel
b. To allow the transmission of authentication information (e.g. username and password) by users of access VPN
c. To open a managed secure tunnel across the public internet
d. To verify the user identity to allow other protocols to open tunnels only with authorized parties.