Technology and Network Services

**In the coin-operated bucket algorithm:**

A. The capacity of the bucket is linked to the long-term average speed.

B. The bucket capacity is linked to the maximum burst size.

C. The capacity of the bucket has a direct relationship with the band.

D. It is used to implement weighted fair queuing.

**The so-called VPN (virtual private network) access solutions or virtual dial-up VPN currently most popular are based on:**

A. Dial-up connections.

B. Tunneling through an IP network.

C. Use of an existing cabling infrastructure to provide broadband access services band

D. New line protocols (data-link level).

**The solutions for the realization of level 3 VPN (virtual private network) through one dorsal MPLS are characterized by**

A. Particularly high levels of security.

B. High scalability

C. Unlike all the other proposed solutions, they do not require the use of NAT (network address translator) when dealing with private addresses.

D. The provision of a quality service guaranteed to traffic passing through the VPN.

**How many headers can be present in a package traveling on a GRE tunnel?**

A. One, otherwise the addressing is ambiguous.

B. Two headers, but the internal one can only contain private addresses.

C. Two headers, without particular limitations.

D. Two headers, but the external one can only contain private addresses.

**In a packet traveling on an MPLS network, is it possible to have multiple labels at the same time?**

A. No, it is not expected.

B. Yes, but not more than 2.

C. Yes, but no more than 20.

D. Yes, but only in the MPLS tunnels used for VPNs.

**What is the scope function associated with IPv6 addresses?**

A. It is used to resolve ambiguity about the sender in special cases.

B. There is no scope associated with IPv6 addresses.

C. It is used to use global addresses.

D. It is used to be able to use anycast addresses.

**Is IPv6 stateless auto configuration having privacy issues?**

A. There are no particular problems.

B. It does not allow encryption of the load.

C. It is possible to find the same interface if it connects to the internet from various providers.

D. It does not allow the use of security headers (like IPsec).

**How can MPLS be used to build a VPN?**

A. To create an access VPN.

B. MPLS cannot be used to make VPNs.

C. It can provide all the routing mechanism in overlay networks or links point-to-point in peer networks.

D. It can provide point-to-point connections in overlay networks or the whole mechanism routing in peer networks.

**The MPLS (multi-protocol label switching) architecture is characterized by**

A. A different mechanism (compared to pure IP) to decide the exit interface to which a packet should be forwarded.

B. A particularly advanced support to provide guaranteed quality services.

C. Routing protocols particularly quick to update routing tables later to topological changes in order to quickly recover from failures.

D. Intelligent network terminals that can customize the services received from the network.

**PPTP is usually used for:**

A. Allow to create a tunnel in an access VPN.

B. Allow to create a tunnel in an overlay site-to-site VPN.

C. Allowing to create a tunnel in a peer site-to-site VPN.

D. Allow to create a tunnel in a level 4 VPN.

**DiffServ differs from IntServ because:**

A. DiffServ tends to provide a guarantee on QoS that IntServ does not give.

B. DiffServ introduces new protocols to allow the booking of resources in order to obtain a given QoS.

C. IntServ tends to provide a guarantee on QoS that DiffServ does not give.

D. DiffServ tends to guarantee a maximum crossing time, while IntServ tends to provide a guaranteed minimum bandwidth.

**What is the use of policing mechanisms?**

A. They are used by the user to agree on the level of QoS to be obtained with the supplier.

B. They are used by the service provider to verify that the traffic entered by the customer complies with the agreements made.

C. They are used by the user to verify that the traffic arriving from the supplier complies with the agreements made.

D. They are used in the various routers to guarantee a maximum crossing time for each of them.

**Unlike IP version 4, version 6:**

A. It has no variable length header.

B. It does not allow to find out the MAC address of another station, knowing its address IP.

C. It does not have an equivalent of TTL (time-to-live).

D. It does not allow the use of IPsec.

**In the coin-operated bucket mechanism it is possible to check:**

A. The maximum traversing time of a router.

B. Internal queue management with WFQ.

C. The minimum speed of data entry.

D. The maximum burst size and the average data entry speed.

**LSPs (label switched path) in the MPLS architecture (multi-protocol label switching)**

A. They are obtained by reserving resources in the network nodes in order to guarantee appropriate quality of service to the applications that created them.

B. They constitute the shortest route to a destination.

C. They are created (set up) by applications for the transport of packets belonging to a forwarding equivalence class (FEC).

D. They are created by network nodes that agree on the labels to be used for packets belonging to a forwarding equivalence class(FEC).

**Layer 3 virtual private network (VPN) solutions through an MPLS backbone are characterized by**

A. Particularly high levels of security thanks to the use of cryptographic techniques.

B. Good level of automation and integration between the public backbone and private networks.

C. Level 3 tunneling mechanisms, ie inside IP packets.

D. Direct management by the user, without operator intervention.

**The GRE protocol is used for:**

A. Encapsulate packets in other IP headers so that they can be sent over a tunnel.

B. Ensure confidentiality of communications.

C. Ensure the authenticity of the packages.

D. Reserve bandwidth for communication.

**The feature of a centralized access VPN is that**

A. Traffic not directed to the VPN is still passed through the VPN gateway.

B. User authentication for VPN access is delegated to the ISP.

C. Traffic not directed to the VPN is not forced to pass through the VPN gateway.

D. User authentication is not done by the VPN gateway.

**In the IPv6 protocol:**

A. Routing protocols (e.g. packet format) do not change compared to IPv4.

B. The ARP protocol is incorporated into ICMPv6, but maintains exactly the scheme of

previous operation (broadcast request, unicast response).

C. There is the possibility for a station on a network segment to configure itself by listening to messages from Router Advertisement.

D. Like IPv4, IPv6 does not provide for router reconfiguration mechanisms.

**In IPv6 what disappears from headers, compared to IPv4?**

A. The life time of the package.

B. The sender and recipient addresses.

C. An indication of what the next heading is.

D. The header checksum.

**The IPv6 addressing scheme:**

A. It only provides addresses uniquely assigned by a responsible body.

B. It provides that each entity (e.g. company) has a set of addresses assigned globally, which become its property for an unlimited time.

C. It requires that the first 64 bits of an address are normally identified as the network prefix, at least on the LAN.

D. It does not provide for the existence of multicast addresses.

**The link-local addresses**

A. They are valid within an organization that can use them to assign addresses to machines in the various subnets of its intranet (they are the counterparts of IPv4 private addresses).

B. They cannot be assigned to routers.

C. They are normally built automatically by the station starting from the MAC address of your card, to which a pre-defined prefix is ​​set.

D. They are used to identify machines that perform a certain service (for example DNS server).

**To create a VPN using MPLS, at level 3 according to the peer model, you can:**

A. Use a suitably modified version of the BGP.

B. Use a suitably modified version of TCP.

C. Use a properly modified version of the RIP.

D. Use a suitably modified version of the RTP.

**Scheduling algorithms are used:**

A. On access routers, to make sure that the traffic generated by a user conforms to the traffic profile negotiated with your service provider.

B. In firewalls, to delay packets entering a corporate network from the Internet for the purpose of preventing certain types of security attacks.

C. In routers, to decide which order the packets waiting for an interface are to be transmitted to.

D. In routers, to properly schedule the list of configuration commands given by the user in order to minimize the disservice caused by the time required for the changes to be applied.

**LSPs (label switched path) in the MPLS architecture (multi-protocol label switching)**

A. They represent alternative routes maintained in the table of a router for forwarding packets to a destination.

B. They are exchanged by routers to build a network map.

C. They are the shortest route to a destination.

D. They are created (set up) for the transport of packets belonging to a forwarding equivalence class (FEC).

**The GRE protocol aims to:**

A. Protect packets against eavesdropping.

B. Manage the encapsulation of packets to be transported through a tunnel.

C. Authenticate the sender of the packets.

D. Check the integrity of incoming packets.

**Stateless auto configuration in IPv6 requires:**

A. A Dinamic Host Configuration Protocol version 6 (DHCPv6) server.

B. A server on the local network.

C. A server on the corporate network (intranet).

D. It is possible even if you are not in the presence of a server or router.

**In what situation is it possible for a packet to have two IP headers?**

A. The packet went through an incoming firewall.

B. The packet is in the public network, after going through a NAT outbound.

C. The packet is in the public network, after passing through a firewall.

D. The packet is in the public network in transit over an IP tunnel that connects two segments of an IP-based VPN.

**In a user station connected to a VPN with centralized access, messages directed to stations outside the VPN pass through:**

A. The VPN site to which the user machine is connected.

B. Stations outside the VPN cannot be reached.

C. A specialized router for these packets.

D. They are sent directly from the user station to the external recipient.

**Unlike version 4 of the IP, version 6:**

A. It does not have an associated version of the ICMP.

B. It does not allow you to find out the MAC address of another station, knowing its IP address.

C. It has no broadcast addresses.

D. It does not have an equivalent of the TTL (time-to-live) field.

**Using the token bucket (or laundry bucket) algorithm with a B token capacity and r token filling speed / s, it is possible to check:**

A. That the crossing time does not exceed rB seconds.

B. The number of packets per second entered does not exceed r, and the maximum burst does not exceed B.

C. The number of packets per second entered does not exceed B, and the maximum burst does not exceed r.

D. The jitter does not exceed B / r.

**The IPsec standard is used in virtual private networks (VPNs) for**

A. Verify the authentication information provided by remote users by exchanging information with an authentication server.

B. Allow users of an access VPN to send authentication information (e.g. username and password or via challenge mechanisms).

C. The construction of tunnels through a public IP network through which it is possible to transport IP packets coming from or destined for a private network regardless of the addressing plan used on that private network (provided that the addressing plans of the two private networks are not overlapping).

D. The automatic creation of encrypted links between the offices of a company through a public network, on which communication is therefore intrinsically insecure.

**DiffServ architecture is characterized by:**

A. A mechanism for separating traffic into classes each of which can receive a specific service in each node traversed

B. Sophisticated reporting protocols for reserving resources

C. The ability to provide guaranteed quality service to applications or flows that explicitly request it from the network

D. Sophisticated routing protocols to choose the path of each individual packet in order to ensure that it receives the service it needs

**How can L2TP be used to make a VPN:**

To create an access VPN.

**What operations can be performed on the labels in an MPLS router:**

Modify, add, delete the outermost label.

**The transition mechanisms in IPV6:**

On more or less sophisticated tunnel mechanisms (IPV6 in IPV4)

**The importance of MPLS (multi-protocol label switching) in today's and future networks derives from the possibility of**

A. Efficiently transport IP packets on ATM networks

B. Connect the servers to their disks at high speed

C. Implement traffic engineering easily and effectively

D. Making equipment capable of operating without the need for configuration

**Optical networks are based on the use of**

A. Fiber optic connections between high performance packet switches

B. IP router capable of forwarding packets based on their destination address by performing the look-up in the routing table with optical techniques.

C. Devices capable of switching an electromagnetic signal at a certain carrier frequency in the field of optics from an input port to an output port

**Virtual private networks (virtual private networks, VPNs) are used for**

A. Transporting private traffic on a shared infrastructure by recreating the same conditions that would be obtained through the use of a private infrastructure

B. Divide a corporate local network into a series of separate subnets for the different business functions (sales, purchases, engineering, marketing)

C. Partitioning a private network (for example that of a parent company with a number of subsidiary companies) into various virtually separate networks

**Virtual private network (VPN) solutions based on secure socket layer (SSL) allow**

A. To securely distribute web-based applications to various servers

B. To create clusters of private servers

C. A company to make specific business applications available to its off-site employees securely.

D. The creation of a backbone on which a service provider can easily and efficiently provide connectivity services to its customers

**The IPv6 protocol provides that the header of the IP packets:**

A. Always be authenticated through appropriate encryption algorithms to increase the security of transmissions

B. It is smaller than that of IPv4 packets in order to increase the efficiency in the use of the transmission band by reducing the protocol overhead

C. It consists only of fields of fixed length which carry necessary information in each package

D. Include some fields, previously available only as IPv4 options, for features that have proven to be widely used over time.

**Forwarding Ipv6 packets over a LAN:**

• It does not use neighbor discovery mechanisms as there is a rule to map any IPv6 address to a MAC address.

• Does not make use of neighbor discovery mechanism with regards to forwarding IPv6 multicast and broadcast packets as there is a rule for mapping these IPv6 addresses to a MAC address.

• Makes use of neighbor discovery mechanisms for all types of IPv6 addresses.

• Does not make use of neighbor discovery mechanisms regarding forwarding of IPv6 multicast packets as there is a rule for mapping these IPv6 addresses to a MAC address.

**A reboot IPv6 host will acquire the following address:**

• It is not possible to know precisely the address itself, since the IPv6 address is regenerated each time with a random number as regards the part reserved for the Interface ID.

• A FE80 :: / 32 address

• As for the link-local address, it will assume the same IPv6 address that it had before the reboot.

• The address depends entirely on the configuration it will acquire from its default router.

**A link-local address:**

• It can be used to allow communication between stations on local links (eg a LAN) in the absence of other IPv6 addresses.

• It is used to physically connect two stations on a local link.

• It is the address used by the stations on a LAN to exchange data.

• It is used in all communications between local stations.

**The Ipv6 addresses**

• They allow the communication of IPv6 stations with IPv4 stations without any particular additional mechanism.

• They maintain the same flexible division between a network part and a host part already present in IPv4.

• They are rigidly partitioned into a network, subnetwork and host part.

• They are rigidly partitioned into a network part and a host part.

**The combination of token bucket (or laundry bucket) and Weighted Fair Queuing (WFQ) mechanisms is used to guarantee:**

• A maximum traversing time of a router.

• A maximum crossing time of a NAT.

• A maximum bandwidth for each packet stream.

• A maximum burst of consecutive packets, for each stream.

**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.

**The concepts of Forwarding and Routing:**

a) They are synonyms; identify the process that allows you to find a valid path for a package, from the sender to the recipient

b) They are synonyms; identify the process that allows, against a packet entering a network node, to determine which is the best exit port to the destination

c) They are different concepts; the forwarding process aims to identify a valid path for a packet, from the sender to the recipient; the routing process allows, against a packet entering a network node, to determine which is the best exit port to the destination

d) They are different concepts; the routing process aims to identify a valid path for a packet, from the sender to the recipient; the forwarding process allows, against a packet entering a network node, to determine which is the best exit port to the destination

**The "Label Swapping" forwarding technique:**

a) It is not suitable if there is a need to provide quality of service guarantees in the forwarding of packages

b) Provides that a data packet maintains the same label ("label") for the entire path from the source node to the destination

c) Requires that all nodes on the path share exactly the same forwarding table

d) May require a "Path Setup" phase to determine the path

**The "Source Routing" forwarding technique:**

a) It involves the use of very simple clients ("hosts") and very complex intermediate nodes ("routers")

b) it is suitable when you want to minimize the number of bytes needed for routing operations and present in each packet

c) The sending node must have (at least partial) knowledge of the network topology

d) is the technique commonly used by the IP protocol in forwarding operations

**Which of these technologies is best suited to manage multiple routes to the same destination ("multipath")?**

a) Forwarding by network address

b) Label Swapping and Source Routing

c) Label Swapping

d) Source Routing

**In routing protocols, the transitional period:**

a) it is present only when the simplest algorithms are adopted (eg Distance Vector)

b) It is never present, as it is a characteristic of the protocols that work at the data-link level (eg Spanning Tree)

c) It always occurs in the period immediately following the detection of a fault

d) It always occurs when a part of the network changes state

**Which of these elements represents a significant disadvantage in centralized routing technology?**

a) Poor performance if the traffic being transported is voice

b) Difficulty in determining the actual network topology in case of failures

c) Particularly intense data traffic around the central node

d) Criticality of the central node from the point of view of robustness and scalability

**In isolated routing:**

a) Each router calculates, through exchanges of messages with its neighbors, its own routing table

b) Each router calculates, through message exchanges with all the routers in the network, its own routing table

c) Each router calculates, by analyzing only the traffic that passes through it, its own routing table

d) Some portions of the network are isolated from the remaining routers, preventing the transit of data between the public portion of the network and the isolated one

**The Distance Vector routing algorithm:**

a) It can cause “Counting to Infinity" phenomena only in nets with meshes

b) Always causes "Counting to Infinity" phenomena in non-meshed networks

c) it is characterized by a lower possibility of "Counting to Infinity" phenomena in networks that do not have meshes if the "Split Horizon" technique is used

d) The phenomenon of Counting to Infinity "belongs to the Link State networks.

**The "Split Horizon" mechanism allows you to:**

a) Eliminate the possibility of loops (cyclic forwarding paths) following changes in the topology

b) Reduce the likelihood of loops occurring due to changes in the topology

c) Disable, during the convergence phase, the sending of data packets to those destinations that could give rise to loops

d) Decrease the routing traffic by implementing the neighbor discovery phase with special packets ("Hello Packets")

**The "Split Horizon" technique:**

a) It requires that the routes received in the announcements of a nearby router are always announced to that neighbor with a metric equal to infinity

b) Provides that a prefix is ​​not announced to the neighbor who represents the "next hop" to that destination

c) It requires that a destination is declared unreachable when the cost exceeds a certain infinity threshold.

d) None of the previous answers

**In the Path Vector routing algorithm:**

a) Each record contained in the Path Vector contains the destination, the distance from the router in question, and the next hop router to reach that destination

b) Each record contained in the Path Vector contains the destination, the distance from the router in question, and the next Autonomous System to reach that destination

c) Each record contained in the Path Vector contains the destination, the distance from the router in question, and the list of routers to be crossed to reach that destination

d) Each record contained in the Path Vector contains the destination, the distance from the router in question, and the list of Autonomous Systems to be crossed to reach that destination

**The "Path Vector" technique allows:**

a) Solve the problem of count to infinity

b) Solve the problem of overlapping routes

c) Making the protocol \ transparent "with respect to the information transported

d) None of the above

**Is it possible to establish a loop in a network that uses Link State-like routing?**

a) Yes

b) No, because each router has a complete view of the network topology

c) No, because Link State updates are flooded

d) No, because a Hold-Down timer is used

**In the final phase of a Link State-type routing algorithm, each router:**

a) Runs the Shortest Path First algorithm, using the Link State Database as input

b) Flood your Link States to neighbors

c) Flood all Link States to neighbors

d) Runs the DUAL algorithm (Diffusing Update Algorithm)

**Redistribution:**

a) is the process that must be enabled on the router to ensure that it is able to sort the packets to the appropriate destination

b) it is used for the exchange of information between an internal router (interior gateway) and an external router (exterior gateway) that uses the BGP protocol

c) It is mainly used by peripheral routing domains, which connect to a single Internet service provider for Internet access

d) is used to allow the routing information to pass from a routing domain A to a routing domain B

**Inter-domain routing:**

a) It requires that each router knows exactly the path, in terms of routers traversed, made by the packets to a destination

b) It requires an exterior gateway to make choices of routes, based on information collected through inter-domain routing protocols, consistent with existing agreements with other autonomous systems

c) It provides that each router knows exactly the cost of reaching any destination (for example in terms of bandwidth of the links crossed) in order to calculate the path at the lowest cost (for example, with higher bandwidth)

d) is a concept that will tend to disappear

**The term "Peering" refers to:**

a) The connection point between two routers of two different Internet Service Providers

b) The exchange of information between a router and a station using a routing protocol

c) The exchange of information between two OSPF routers connected by a virtual link

d) The exchange of information between two OSPF routers in the same area

**An Autonomous System is:**

a) A computer capable of self-configuration

b) An area of ​​an IP network managed, especially from the point of view of routing, independently from the others and with connections to at least two other Autonomous Systems

c) A network device capable of independently discovering the best way to forward packets to destinations

d) The network of an ISP

**Assume the existence of three AS (Autonomous Systems) connected sequentially (A-B-C). If intermediate AS B wants to prevent its network from being used as a transit from A to C:**

a) It must mask the routes to A

b) You must set up an access list ("packet filtering") at the entrance of your domain that discards all incoming packets from A to C

c) He must set the masking of the routes to A and an access list at the entrance of his domain on the packets coming from A and directed to C

d) AS B cannot block traffic, as each AS must provide transit to the AS adjacent to it

**A Network Provider considered \ Tier-1 ":**

a) It has only one interconnection to another Tier-1 Autonomous System

b) it is an Autonomous System connected to other AS Tier-1 only with connections of the "Peering" type, ie not for a fee

c) it is an Autonomous System connected to other AS Tier-1 mainly with connections of the "Peering" type, ie not for a fee

d) it is an Autonomous System connected to other AS Tier-1 mainly with "transit" type connections, ie for a fee

**The RIP protocol provides mechanisms to reduce the possibility of loops occurring:**

a) By analyzing packets in transit and identifying those that pass more than once from the same router

b) By means of traceroute processes activated periodically

c) Through "Split-Horizon" and \ Hold-Down "mechanisms

d) None of the previous answers

**The main limitation of the RIP routing protocol compared to IGRP is that:**

a) As the proprietary RIP is not available on all routers

b) The metric of the RIP is less indicative, compared to that of the IGRP, of the real degree of preferability of a network path compared to others

c) It does not allow, unlike the IGRP, hierarchical routing

d) is a Distance Vector type protocol, therefore less scalable than the IGRP (Link State)

**A difference between the OSPF routing protocol and the IGRP is that:**

a) OSPF is hierarchical

b) OSPF also allows routing between different ASs

c) OSPF allows to simultaneously transport routing information relating to different protocol architectures (integrated routing)

d) OSPF is owner

**The OSPF routing protocol chooses the path to a destination taking into account:**

a) Length of each link along the way

b) Bandwidth and delay for each link

c) It can be configured to use various metrics whose semantics are established by the network manager

d) Hop Count

**An OSPF "Internal Router" in an area maintains in the LSA archive:**

a) The detailed description of the topology of the whole OSPF domain

b) Only and exclusively a detailed description of the topology of the area of ​​which the router is part

c) The detailed description of the topology of the area to which the router belongs and the summaries of all the destinations present in the OSPF routing domain

d) The detailed description of the topology of the area to which the router belongs, the detailed description of the backbone area, and the summary of the remaining destinations present in the OSPF routing domain

**In the OSPF protocol, the routers connected to the same LAN are represented in the graph that describes the network as:**

a) A single knot

b) A structure of stellar-shaped logical connections

c) A fully meshed structure of logical connections

d) A structure consisting of a set of nodes on a broadcast link

**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 that describes the whole AS

d) A set of Distance Vector of all adjacent routers

**An OSPF Area Border Router**

a) It has summary information on the areas it overlooks and disseminates it in the areas; does not know the details of these areas.

b) Know the details of the backbone area

c) Generate type 5 LSA to describe destinations outside the routing domain.

d) Forwards, through the flooding mechanism, all the LSAs it receives from one area to all the others it overlooks

**The BGP routing protocol:**

a) Use rules (policies) on additional information to cost metrics to identify the "best" to reach a destination

b) it is used exclusively for exchanges of information between different autonomous system routers

c) it is used exclusively for exchanges of information between routers of the same autonomous system

d) it is the protocol that will replace OSPF

**The "Path Vector" technique used by BGP:**

a) Stores in the Path Vectors the list of Autonomous Systems to be crossed to reach a given destination network

b) Stores in the Path Vectors the list of routers to be crossed to reach a given destination network

c) Stores in the Path Vectors the next Autonomous System to be crossed to reach a given destination network

d) Stores in the Path Vectors the next router to be crossed to reach a given destination network

**In the BGP routing protocol:**

a) Topology information always takes precedence over the application of routing policies ("policy")

b) The application of routing policies ("policy") always takes precedence over topology information

c) The lowest cost route to each destination is always chosen

d) The lowest cost route to each destination is always chosen, unless there are intrinsic limitations to the functioning of hierarchical routing