Lecture 7 - Routers Quiz ANS

1. Conceptually, what is a router best described as?
A) A simple switch that connects two computers
B) A specialized computer optimized for forwarding packets
C) A server that hosts websites
D) A database for storing network logs

ANS:

2. Which of the following is NOT one of the three main 'planes' of a router?
A) Data Plane
B) Control Plane
C) Security Plane
D) Management Plane

ANS:

3. What is the primary function of the Data Plane?
A) Running routing protocols like OSPF or BGP
B) Configuring the router's IP address
C) Forwarding packets from input ports to output ports
D) Monitoring the temperature of the chassis

ANS:

4. On what time scale does the Control Plane typically operate?
A) Nanoseconds
B) Seconds
C) Hours
D) Microseconds

ANS:

5. Which physical component provides the high-bandwidth interconnection between linecards?
A) The CPU
B) The Controller Card
C) The Switch Fabric
D) The Ethernet Cable

ANS:

6. Why is the forwarding table stored on the linecards rather than just the main controller?
A) To save memory on the controller
B) Because the controller is too busy running games
C) To enable distributed, high-speed forwarding without bottlenecking the controller
D) It is only stored on the linecards for backup purposes

ANS:

7. What are 'User Packets' in the context of router traffic types?
A) Packets containing commands for the router administrator
B) Packets destined for the router itself
C) Traffic that the router simply forwards toward a destination
D) Malformed packets that must be dropped

ANS:

8. What is 'Punt Traffic'?
A) Traffic used for sports analytics
B) Packets requiring extra processing (exception handling) by the controller
C) Packets sent between two routers to exchange routing tables
D) Encrypted packets that cannot be read

ANS:

9. Why must modern routers implement forwarding in hardware rather than software?
A) Hardware is cheaper than software
B) Software is too error-prone
C) General-purpose CPUs cannot handle the scale (billions of packets per second)
D) Hardware is easier to update than software

ANS:

10. In the forwarding pipeline, what does the 'Lookup' stage do?
A) Decodes the optical signal into bits
B) Finds the next hop output port for the destination address
C) Decrements the Time-To-Live (TTL) field
D) Places the packet into a queue

ANS:

11. Which of the following operations is considered 'hard' to do in hardware at line rate?
A) Decrementing TTL
B) Updating the header checksum
C) Reading specific bits of the packet
D) Handling packet fragmentation if the packet is too big

ANS:

12. What problem does the 'Longest Prefix Match' (LPM) solve?
A) It ensures the longest packet gets priority
B) It resolves overlaps where an address matches multiple entries in the forwarding table
C) It finds the path with the most bandwidth
D) It prevents loops in the network

ANS:

13. What data structure is commonly used to implement efficient Longest Prefix Match?
A) Linked List
B) Hash Map

C) Trie (Prefix Tree)
D) Stack

ANS:

14. What is the time complexity of looking up an IPv4 address in a Trie?
A) O(N) where N is the number of entries in the table
B) O(1) / Constant (bounded by the number of bits in the address)
C) O(log N) where N is the number of routers in the world
D) O(N^2) effectively random

ANS:

15. If a packet arrives and matches NO entries in the forwarding table, what typically happens?
A) It is broadcast to all ports
B) It is sent back to the sender
C) It uses the default route; if no default route exists, it is dropped
D) The router crashes

ANS: