15 minutes

[M1] Quiz 2

[Generalized Forwarding & SDN] In contrast to the destination-based forwarding, which has been traditionally used in the internet, generalized forwarding has been widely deployed in networks, including the Internet.

* This form will record your name, please fill your name.

1. [Generalized Forwarding & SDN] "In destination-based forwarding, routers self-organize to forward packets solely based on source and destination addresses, which has been traditionally used in the Internet. However, _____ forwarding has gained popularity and some portions of the Internet already have their behavior dictated by SDN technologies. For example, with _____ protocol, network managers can build the routers' _____ tables, establishing actions and rules based on packets' headers and policies of their interest." Which of the above options best fill the blanks above? (4 Points)

   - ◯ information-centric; OpenFlow; forwarding
   - ◯ generalized; NAT; match-plus-action
   - ◯ generalized; OpenFlow; forwarding
   - ◯ generalized; OpenFlow; match-plus-action

2. [Internet Protocol] Which option below is **false** about IPv62? (4 Points)

- IPv6 is the successor to IPv4 and was developed to address the limitations of the IPv4 address space.
- Despite its many benefits, IPv6 adoption has been slow due to factors such as the cost and complexity of upgrading network infrastructure, and a lack of perceived benefits for some organizations.
- IPv6 has a smaller header (in number of bits) in comparison to IPv4.
- To handle a massive number of connections, such as in IoT scenarios, IPv6 is preferable over NAT due to its smaller processing overhead.

3. [Network Address Translation] NAT is widely used even though it has some practical limitations. Which of the following options is a NAT limitation? (4 Points)

- Limited scalability: NAT can become a bottleneck in large networks, as it requires the use of a single public IP address to represent multiple internal devices. This can lead to performance issues and may require additional resources to manage.
- NAT depends on upper layers (e.g., Transport layer) to perform the address:port mapping, which cause additional communication overhead and interfere in processes communication.
- NAT-enabled routers are special equipment that often overload its role with other network control systems (e.g., DHCP servers). This makes NAT-based networks more complicated to deploy and maintain.
- All of the above

4. [DHCP] The following four options represent each of the messages exchanged (in order and simplified) when an incoming host tries to dynamically obtain a lease of an IP address from one of the available DHCP servers. One of these messages has a small mistake. Can you identify it? (4 Points)

- ◯ DISCOVER: src: 0.0.0.0, 68 | dest: 255.255.255.255,67 | yiaddr: 0.0.0.0
- ◯ OFFER: src: 223.1.2.5, 67 | dest: 255.255.255.255,68 | yiaddr: 223.1.2.4 | DHCP server ID: 223.1.2.5
- ◯ REQUEST: src: 0.0.0.0, 68 | dest: 255.255.255.255, 67 | yiaddrr: 223.1.2.4 | DHCP server ID: 223.1.2.5
- ◯ ACK: src: 223.1.2.5, 67 | dest: 223.1.2.4,68 | yiaddrr: 223.1.2.4 | DHCP server ID: 223.1.2.5

5. [Subnets] A network manager needs to accommodate 120 hosts in a network. Given that the gateway router's interface has IP 125.43.128.0, what is the number of bits for the subnet mask that best fits this demand? (4 Points)

- ◯ 7
- ◯ 25
- ◯ 8
- ◯ 24