100-(30+24)=46

CS305 2023f lab_assignment2

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Total 【100】

Part1: Multiple answer and Multiple choice questions which have been deployed in the assignment test "lab_assignment2_part1" of the course's BlackBoard site. Please go to the BB site to answer them before the DDL.**【30=5*6】**

Part2: Build a network topology on the simulator, complete the configuration and do the tests. **【50=10+40】+【20=5*4】**

A company needs to plan and build a network that uses private IPv4 addresses internally and is connected to the external network on the exit router(RE). The internal network is logically divided into a client subnet (subnet-c) and a server subnet (subnet-s) based on the role of the client/server. At least three routers(RC, RS, RE) need to be used in the network, the correspondence between the three routers (RC, RS, RE) in the network and the network is as follows:

1)The router (RC) is responsible for forwarding packets related to the client subnet (subnet-c), there should be three VLANs (VLAN-D, VLAN-M, VLAN-G) based on the user's characteristics, providing network services to the R&D team, management team, and visitors, respectively.

a. The network terminals in the same VLAN can access each other, but terminal in different VLANs cannot access each other;

b. The network terminals in the three VLANs are all in DHCP client mode and obtain automatic configuration from the DHCP server.

c. Each VLAN corresponding to a virtual interface, and the network ID parts of the IP addresses of the three virtual interfaces are different.

2) Routers (RS) are responsible for forwarding packets related to server subnets (subnet-s), which are internally deployed with DNS servers (S-DNS), internal servers (S-I), and external servers (S-E).

a. The addresses of three servers are statically configured.

b. The router implements the following access controls:

b-1) DNS server (S-DNS) accessible to everyone on the intranet

b-2) External server (S-E) accessible to everyone on the intranet

b-3) Internal servers (S-I) can only be accessed by R&D and management departments

3) The router (RE) is responsible for the connection and access control of the internal and external networks of the company, and its main functions are as follows:

a. Implement NAT conversion of static address for DNS server (S-DNS) and external server (S-E);

b. Implement NAT/NAPT conversion of dynamic addresses for all clients in the intranet;

c. Implement access control: External terminals can only access external servers (S-E) and CANNOT access internal server (S-I) and DNS server(S-DNS) .

Part2-1: Based on the above requirements, please plan the VLAN subnet and server addresses reasonably and complete the following table **【10】**

Server Name /VLAN Name	Private IP address(rang) /subnet mask	IP of Gateway	Public IP address(rang) /subnet mask	Static/dynamic mapping for NAT/NAPT

Part2-2. Please refer to the above requirements to complete the construction and testing of the network topology 【**40**】

【10】Implement DHCP service as the plan of Part2-1.

【10】Implement VLAN as the requirements.

【5】NAT static mapping

【5】NAT dynamic mapping / NAPT

【5】ACL1: Internal servers (S-I) can only be accessed by R&D and management departments, while DNS server (S-DNS) and exter server(S-E) is accessible to everyone on the intranet

【5】ACL2：External terminals can only access external servers (S-E) and CANNOT access internal server (S-I) and DNS server(S-DNS)

Part2-3. The additional points for Part2 are as follows 【20】

1. Implement interflow between VLANs 【2-5】
2. Implementation of DHCP relay 【2-5】
3. Implement interflow between RIP and OSPF 【2-5】
4. Implement remote configuration through telnet 【2-5】

Tips: (2 points for implementation in simple networks, and 5 points for implementation in the network topology for the company)

Part 3. Network Device Configuration 【20】+【5】

1). Log in to the H3C network device through the console port, show the summary information of all interfaces on the device, and distinguish between layer 2 interfaces and layer 3 interfaces. 【2】

2). Set up a DHCP server on H3C network devices to provide DHCP services for all clients (at least 2 devices) in the network 【5】

3). Complete any 2 questions in Practice14.1-14.5 of courseware lab14 【10, 5 points per question】

4). Set up H3C devices remote login, allowing users to log in to the device via telnet on a local PC for viewing and configuration work 【2】. Users can also log in to the device via telnet on non directly connected PCs for viewing and configuration work. 【1】

5). Complete Practic14.6 in courseware lab14, realize interconnection and configuration of three routers, and achieve network interoperability 【5】

TIPS. It’s suggested to using Huawei's simulator eNSP for more complex network topology.