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Chapter 5 Questions

1.What are the reasons to use DHCP?
The reason to use DHCP is because we can not assign IP addresses when there is a large number of hosts, we need DHCP to have a systematic service dedicated to assigning IP addresses. The DHCP service can also deliver other network parameters, such as the IP addresses of a DNS server and subnet masks

2.Describe how a DHCP client can get its IP address from a DHCP server.
First, the DHCP client searches for a server by broadcasting a DHCP discovery packet called DHCPDISCOVER. When the server receives the packet, it then returns a DHCPOFFER that contains the IP address, the IP address lease time, the subnet mask, and the information about the default gateway. Next, the client responds with DHCPREQUEST to tell all other servers that a server has been accepted. Lastly, the DHCP server sends a DHCPACK telling the client you can now use the IP address for communication.

3.When the DHCP server is not reachable, what type of IP address will the DHCP client get?
When DHCP isn't reachable, the client will get an Automatic Private IP Addressing (APIPA) IP address.

4.What is the value of the default lease time?
The default DHCP lease time is 8 days. The lease time can be specified during the configuration of a DHCP server.

5.How can a DHCP server renew a dynamic IP address?
The dynamic IP address is automatically renewed after half of the lease time expires. Once half of the lease time is reached, the DHCP client will issue a new request to the DHCP server to renew the IP address. The new request is issued by sending a DHCPREQUEST packet directly to the DHCP server.

6.Why do you need a permanent IP address?
In order to be accessible remotely, a computer might need a permanent address. This way, other network hosts can be configured with the remote connection dedicated to this computer.

7.How to assign a permanent IP address to a network host?
If a network administrator needs to assign a computer a permanent IP address, he or she can assign a fixed IP address or assign a reserved dynamic IP address to that computer by relating a specific IP address to the hardware address of that computer. This can be done during the configuration of the DHCP service.

8.How does a DHCP relay work?
Basically, since a DHCP client cannot send a broadcast packet through a router, we have DHCP relay which sets up a router to send packets to another subnet. This way, the client can now receive a dynamic IP address from the other subnet. If a router is configured as a DHCP relay, it will pass DHCP request packets to another network. The router is so configured that it can find a DHCP server in a different network and forward DHCP requests to that DHCP server. When the DHCP server responds with a broadcast packet, the router with the DHCP relay gets the packet and forwards it to the DHCP client in another network

9.List the DHCP specifications that should be worked out before installing a DHCP service.
Before installing a DHCP service, we should make sure that the user that performs the installation is a domain user with the local administrative privilege. In addition, we should ensure that in a production environment, the server with the DHCP role installed should have a static IP address.

10.What properties should be specified for a DHCP scope?
Firstly, the scope is defined according to the IP address range for the subnet, so the range of Ip addresses to be handed out by the DHCP server should be specified. In addition, a scope name given by the network administrator and the lease time for a handed-out IP address should be specified.

11.Why do we need the DNS service?
Network hosts have a IP address for data communication; however, the ip address is not easy to remember. A DNS service resolves host names to IP addresses and vice versa. This is especially true in business environments where its hierarchical system can be represented by an Active Directory system.

12.List at least five category-based top-level domains.
.com is a top level domain that is used for commercial purposes. In addition, .info is for the category information. .int is international use. .biz -> business And .museum is used for museum domains.

13.What is the maximum number of layers that can be added to the name hierarchy?
According to the hierarchical structure of the organization, department names and hostnames can all be added to the organization's name. Under the organization's name, one can add up to 127 layers of names.

14.What is a root server?
Since there are billions of hosts, databases have many DNS servers to hold all the information concerning these hosts. The root server hosts the top-level domain. This contains IP address and name records such as com and edu.

15.What is a forward lookup process?
The process to match the IP address for a given domain name is called a forward lookup process.

16.What is a reverse lookup process?
This is the opposite process of a forward lookup process: The process to match the domain name for a given IP address is called a reverse lookup process.

17.Before forwarding the name resolution request to the root server, what does the operating system need to check first?
The operating system checks the file that is named HOSTS for the related IP address. If the file HOSTS does not have the matching IP address for the name entered in the URL, the operating system will check the DNS cache to see if there is a matched IP address.

18.What is a DNS zone?
Since the DNS database has millions of DNS servers, the small portion of the entire DNS namespace is referred to as the DNSzone.

19.What is an NS DNS record?
There are many types of DNS records. One of them is the NS DNS record, which is the type of record that is used to bind an IP address to a specified DNS server.

20.What is an SOA DNS record?

There are many types of DNS records. One of them is the SOA DNS record, which is the start of an authority type of record that contains the configuration information about the domain that this DNS server is responsible for.