

## **Exercises**

### **Exercise 1 :**

Answer the following statements with true or false and justify your answer.

- 1- A DHCP client always gets the same IP address each time it makes the request.
- 2- False, DHCP allows dynamic allocation of IP addresses
- 3- It is possible to have several DHCP servers on the same network
- 4- True. A client can receive several DHCP offers
- 5- A DHCP server can offer clients the default router address.
- 6- True, this could be specified in its configuration file

**Question 2:** Consider an IP network managed by a DHCP server using the address range 192.168.1.1 to 192.168.1.100. What problems can occur if a customer manually configures his machine using the IP address 192.168.1.2? Consider the case where the address is already allocated by the DHCP server and the opposite case.

- 1- Case where the address is already allocated by the server: address conflicts.
- 2- Case where the address is not allocated by the server: The client works normally.  
However, the address is considered free by the server and can be offered to another client.

**Question 3:** In order to improve fault tolerance, a network administrator decides to set up two DHCP servers on two different machines using exactly the same IP address range. What are the consequences of this strategy? Do you have a better proposal and what is it?

- Consequence: the same address can be proposed (DHCPOFFER) or even assigned (DHCPACK) to two different clients (at the same time because otherwise DHCP tests the existence of the proposed address before sending the DHCPACK).
- Proposal: two different ranges

**Question 4:** If a network contains several DHCP servers. Explain how a DHCP server realizes that the offer it made to a client was not successful.

- By receiving a DHCPREQUEST (message sent in broadcast) which contains the identity of the selected DHCP server (which is not its own)

No. ,	Time	Source	Destination	Protocol	Info
1	0.000000	0.0.0.0	255.255.255.255	DHCP	DHCP Discover - Transaction ID 0x7e2c562a
2	0.017351	192.168.1.1	192.168.1.2	DHCP	DHCP Offer - Transaction ID 0x7e2c562a
3	0.017722	0.0.0.0	255.255.255.255	DHCP	DHCP Request - Transaction ID 0x7e2c562a
4	0.052182	192.168.1.1	192.168.1.2	DHCP	DHCP ACK - Transaction ID 0x7e2c562a

a. Identify the IP address of the DHCP server

192.18.1.1

b. Identify the IP address that the server proposes for the client

192.168.1.2

c. For message 1, does the client know the IP address of the DHCP server? Explain

No. The client does not even know if there are DHCP servers or not

d. For message 3, does the client know the IP address of the DHCP server? Explain

Yes, the client has already received the server address in DHCP OFFER

### Exercise 2:

1-the following figures represent the set of packets captured on a network. specify the type of attack and the countermeasures

No.	Time	Source	Destination	Protocol	Length	Info
56	24.16095	0.0.0.0	255.255.255.255	DHCP	286	DHCP Discover - Transaction ID 0x7c957961
58	26.11032	192.168.1.1	192.168.1.11	DHCP	320	DHCP Offer - Transaction ID 0x7c957961
59	26.11137	0.0.0.0	255.255.255.255	DHCP	304	DHCP Request - Transaction ID 0x7c957961
60	26.14777	192.168.1.1	192.168.1.11	DHCP	320	DHCP ACK - Transaction ID 0x7c957961
61	26.14877	0.0.0.0	255.255.255.255	DHCP	286	DHCP Discover - Transaction ID 0xad3c806b
63	28.14041	192.168.1.1	192.168.1.12	DHCP	320	DHCP Offer - Transaction ID 0xad3c806b
64	28.14143	0.0.0.0	255.255.255.255	DHCP	304	DHCP Request - Transaction ID 0xad3c806b
65	28.16074	192.168.1.1	192.168.1.12	DHCP	320	DHCP ACK - Transaction ID 0xad3c806b
66	28.16184	0.0.0.0	255.255.255.255	DHCP	286	DHCP Discover - Transaction ID 0x3e9c6137
70	30.11740	192.168.1.1	192.168.1.13	DHCP	320	DHCP Offer - Transaction ID 0x3e9c6137
71	30.11836	0.0.0.0	255.255.255.255	DHCP	304	DHCP Request - Transaction ID 0x3e9c6137
72	30.14190	192.168.1.1	192.168.1.13	DHCP	320	DHCP ACK - Transaction ID 0x3e9c6137
73	30.14288	0.0.0.0	255.255.255.255	DHCP	286	DHCP Discover - Transaction ID 0xdf599404
75	31.56000	192.168.1.1	192.168.1.14	DHCP	320	DHCP Offer - Transaction ID 0xdf599404
76	31.56311	0.0.0.0	255.255.255.255	DHCP	304	DHCP Request - Transaction ID 0xdf599404
77	31.60755	192.168.1.1	192.168.1.14	DHCP	320	DHCP ACK - Transaction ID 0xdf599404

- dhcp starvation, the attacker changes each time his mac address and asks for an IP configuration
- configuration against a measure limiting the number of mac addresses per port

**Administration**

Username:

Password:

- flood the server with automatic registration requests
- countermeasure: anti-automation process, captcha