

P.V.P Siddhartha Institute of Technology				Marks Obtained:
Department of Computer Science and Engineering				
Program: B.Tech	Year: III	Semester: I	Assignment: I	
Regulation:PVP20	A.Y:2024-25		Date of Submission:10-08-2024	
Course Code: 20CS3503		Course Name: Computer Networks		
Registered Number:			Student Name:	
Answer all the Questions. Each Question carries 2.5 Mark				2×2.5 M =5 M

Q.No.	Question	CO	Level																				
1.	<p>DHCP Configuration:</p> <p>DHCP: Dynamic Host Configuration Protocol is used for automatically assigning IP Configuration to one or more hosts. Imagine a scenario where your small company has purchased 20 desktops for official use and wants you to assign IP addresses and other information on it. Now, going to all the desktops and assigning information one by one is a time taking process. Solution to this problem is a DHCP Server. There could be a specific server that provides Dynamic Host Configuration Protocol Services.</p> <p>Table-1 List of network components.</p> <table border="1"> <thead> <tr> <th>S.NO</th><th>Device</th><th>Model-Name</th><th>Unit</th></tr> </thead> <tbody> <tr> <td>1.</td><td>PC</td><td>PC</td><td>20</td></tr> <tr> <td>2.</td><td>Switch</td><td>PT-Switch</td><td>2</td></tr> <tr> <td>3.</td><td>Router</td><td>PT-Router</td><td>1</td></tr> <tr> <td>4.</td><td>Server</td><td>Server-PT</td><td>1</td></tr> </tbody> </table> <p>a) Discuss in detailed about DHCP message format.</p> <p>b) How exactly DHCP works, explain the process of DHCP operations with state diagram.</p> <p>c) Create two LANs using the network components listed in table-1 in CISCO packet tracer. (The number of PCs in each LAN is 10, each LAN connected with separate switch; two switches are connected to router). The sample network given bellow.</p> <p>Figure 1. Sample network</p>	S.NO	Device	Model-Name	Unit	1.	PC	PC	20	2.	Switch	PT-Switch	2	3.	Router	PT-Router	1	4.	Server	Server-PT	1	CO1,CO2,CO5	L4
S.NO	Device	Model-Name	Unit																				
1.	PC	PC	20																				
2.	Switch	PT-Switch	2																				
3.	Router	PT-Router	1																				
4.	Server	Server-PT	1																				

d) Configuring Router with IPv4 Address and Subnet Mask, example given bellow.

FastEthernet0/0	172.168.10.1	255.255.255.0
FastEthernet0/1	192.168.10.1	255.255.255.0

e) Demonstrate complete configuration of DHCP in packet tracer.

Reference Links

<https://www.youtube.com/watch?v=dyVXVQgos4Q>

<https://www.geeksforgeeks.org/dhcp-server-configuration-in-cisco/>

<https://computernetworking747640215.wordpress.com/2018/07/05/how-to-configure-dhcp-server-in-packet-tracer/>

2.

Fragmentation at Network layer:

When a host sends an IP packet onto the network it cannot be larger than the maximum size supported by that local network. This size is determined by the network's data link and IP Maximum Transmission Units (MTUs) which are usually the same. A typical contemporary office, campus or data centre network provided over Ethernet will have 1500 byte MTUs. However, packets that are initially transmitted over a network supporting one MTU may need be routed across networks (such as a WAN or VPN tunnel) with a smaller MTU. In these cases, if the packet size exceeds the lower MTU the data in the packet must be fragmented (if possible). This means it is broken into pieces carried within new packets (fragments) that are equal to or smaller than the lower MTU. This is called Fragmentation and the data in these fragments is then typically reassembled when they reach their destination.

- What are IPv4 fields related to fragmentation? Give example.
- A packet has arrived with an M bit value of 0. Is this the first fragment, the last fragment, or a middle fragment? Do you know if the packet was fragmented?
- A packet has arrived with an M bit value of 1 and a fragmentation offset value of 0. Is this the first fragment, the last fragment, or a middle fragment?
- A packet has arrived in which the offset value is 100, the value of HLEN is 5, and the value of the total length field is 100. What are the numbers of the first byte and the last byte?
- Demonstrate IP fragmentation in packet tracer.

Reference links

<https://www.youtube.com/watch?v=w13sR0Fa-eA>

<https://www.cisco.com/c/en/us/support/docs/ip/generic-routing-encapsulation-gre/25885-pmtud-ipfrag.html>

<https://www.geeksforgeeks.org/fragmentation-network-layer/>

<https://packetpushers.net/ip-fragmentation-in-detail/>

CO1,CO2,CO4,
CO5

L4