Protocol Visualization with Packet Tracer

Learning Objectives:

1. Explore Packet Tracer Real-Time Mode and Simulation Mode
2. Explore logical workspace
3. To become familiar with building topologies in Packet Tracer

Step 1: Draw the following topology (make sure you are in Real-Time Mode)

![Topology Diagram](image)

**Figure 1**

Step 2: Configure IP Addresses and Subnet Masks on the hosts. Use the following information to configure IP addresses, subnet masks and DNS Server

<table>
<thead>
<tr>
<th>Host</th>
<th>IP Address</th>
<th>Subnet Mask</th>
<th>DNS Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC0</td>
<td>172.16.1.10</td>
<td>255.255.0.0</td>
<td>172.16.1.100</td>
</tr>
<tr>
<td>PC1</td>
<td>172.16.1.11</td>
<td>255.255.0.0</td>
<td>172.16.1.100</td>
</tr>
<tr>
<td>PC2</td>
<td>172.16.1.12</td>
<td>255.255.0.0</td>
<td>172.16.1.100</td>
</tr>
<tr>
<td>PC3</td>
<td>172.16.1.13</td>
<td>255.255.0.0</td>
<td>172.16.1.100</td>
</tr>
</tbody>
</table>

Step 3: Connect the Hub to the Switch using appropriate cable type.
Note: The link light for switch port will begin as amber and eventually change to green as the *Spanning Tree Protocol* transitions the port to *forwarding*.

Step 4: Verify Connectivity in Simulation Mode

- Edit Filters
- Deselect *Show All/None* and choose only *ICMP*
- Click *Add Simple PDU*
- Click once on *PC0* and another one on *PC3*
- Continue clicking *Capture/Forward* button until the ICMP ping is completed.
Note: You should see the ICMP messages move between the hosts, hub and switch.
- The PDU Last Status should show as *Successful* (as per illustrated in figure 2 below).
Step 5: Change the IP address of PC3 to 172.16.2.13. Perform a ping from PC0 to PC3. What is the ping result?

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______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Step 6: Return the IP address of PC3 to 172.16.1.13. Change the IP address of PC2 to 172.17.1.12. Perform a ping from PC0 to PC2. What is the ping result?

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Step 7: Save the topology
Exercise: Working with Application Layer: DHCP, DNS, HTTP, HTTPS and Email

Step 1: Draw the following network diagram and use the information given to configure the devices

Note: This is an example of what your final topology should look like for this exercise. Follow the given instructions.

Instruction:

1. Start Packet Tracer using Real-Time mode
   - Options → Preferences
   - Enable “Show Link Lights”
   - Disable “Hide Device Label”
2. Configure DHCP Server
   - On the Global Settings:
     - Change the Display Name to **DHCP Server**
     - Set the Gateway to **172.16.0.1**
   - FastEthernet:
     - Set the IP address to **172.16.0.10**
     - Set the subnet mask to **255.255.0.0**
   - HTTP:
     - Set HTTP service and HTTPS service to **OFF**
3. Configuring DNS Server
   - Global Settings:
     - Change the Display Name to **DNS Server**
     - Set the Gateway to **172.16.0.1**
   - FastEthernet:
     - Set the IP address to **172.16.0.11**
     - Set the subnet mask to **255.255.0.0**
   - HTTP:
     - Set HTTP service and HTTPS service to **OFF**
   - DHCP:
     - Set the service to **OFF**
   - DNS:
     - Entering the www.uniten.edu.my Domain Name
       - Enter for the Domain Name **www.uniten.edu.my**
       - Enter for the IP address **172.16.0.20**
       - Click **Add**
     - Entering the www.example.com Domain Name
       - Enter for the Domain Name **www.example.com**
       - Enter for the IP address **172.16.0.30**
       - Click **Add**
   - Email:
     - Set the SMTP service and POP3 service to **OFF**

4. Configuring **www.uniten.edu.my** Web Server
   - Global Settings:
     - Change the Display Name to **Web Server: www.uniten.edu.my**
     - Set the Gateway to **172.16.0.1**
   - FastEthernet:
     - Set the IP address to **172.16.0.20**
     - Set the subnet mask to **255.255.0.0**
   - DHCP:
     - Set the service to **OFF**
   - DNS:
     - Set the service to **OFF**
   - HTTP:
     - Set both HTTP and HTTPS Service to **ON**
5. Configuring the www.example.com Web Server

- **Global Settings:**
  - Change the Display Name to **Web Server: www.example.com**
  - Set the Gateway to **172.16.0.1**
- **FastEthernet:**
  - Set the IP address to **172.16.0.30**
  - Set the subnet mask to **255.255.0.0**
- **DHCP:**
  - Set the service to **OFF**
- **DNS:**
  - Set the service to **OFF**
- **HTTP:**
  - Change the sentence, “<hr> Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.” to “<hr> This is the corporate internal network!”. You may add other information as well.

6. Configuring the mail.uniten.edu.my Email Server

- **Global Settings:**
  - Change the Display Name to **Email Server: mail.uniten.edu.my**
  - Set the Gateway to **172.16.0.1**
- **FastEthernet:**
  - Set the IP address to **172.16.0.40**
  - Set the subnet mask to **255.255.0.0**
- **DHCP:**
  - Set the service to **OFF**
- **DNS:**
  - Set the service to **OFF**
- **HTTP:**
  - Set HTTP Service and HTTPS Service to **OFF**
- **Email:**
  - Set the SMTP service and POP3 service to **ON**
  - Set the domain name to **mail.uniten.edu.my**
  - Setup three user accounts as follows:

<table>
<thead>
<tr>
<th>Users</th>
<th>Passwords</th>
</tr>
</thead>
<tbody>
<tr>
<td>User1</td>
<td>Password1</td>
</tr>
<tr>
<td>User2</td>
<td>Password2</td>
</tr>
<tr>
<td>User3</td>
<td>Password3</td>
</tr>
</tbody>
</table>
7. Configure Two Client Computers using DHCP
   - Global settings (on every PC):
     - Change the Display Name to **Dynamic 1** and **Dynamic 2** respectively
     - Set the Gateway/DNS to **DHCP**
   - FastEthernet:
     - Set the IP Configuration to **DHCP**

8. Configure One Client Computer using Static IP Addressing
   - Global settings:
     - Change the Display Name to **Static**
     - Set the Gateway/DNS to **Static**
     - Set Gateway to **172.16.0.1**
     - Set the DNS Server to **172.16.0.11**
   - FastEthernet:
     - Be sure the configuration is set to **Static**
     - Set the IP address to **172.16.0.90**
     - Set the subnet mask to **255.255.0.0**

9. Configure Email for Clients. Click once on the Dynamic 1 (PC0). Enter the required information as shown in figure 4 below.

![Figure 4](image)

10. Save the configuration
11. Do the same for **User2** and **User3**
12. Verify Connectivity
   - Ping (ICMP)
     o From a client computer use the Desktop Command prompt to ping the other
       client computers and the servers
     o Example: From Dynamic 1, C> **ping 172.16.0.20**
     o The first or two pings may fail, but you should receive a reply on the later
       pings. This is due to the ping timing out while the ARP process takes place.
   - Web Browser (HTTP)
     o On the client computers use the Desktop Web Browser, enter the URLs of
     o You should see the web pages that you created on these servers.
   - Email (SMTP)
     o From client computer **(Dynamic 1)**, compose an email (from Desktop tab) to
       another client computer **(Static)**.
     o i.e: To: User3@mail.uniten.edu.my
     o Upon sending the email, check if email was received by the Static PC by
       clicking the Email icon (Desktop tab), then click the Receive button.
   - Verify your work (either the email has been received or not)

13. On Simulation Mode
   - Click **“Reset Simulation”**
     o Edit Filters
     o Only choose the following protocols: DHCP, ICMP, HTTP, DNS, HTTPS, SMTP
   - Web Browser (HTTP)
     o On client computers use Desktop Web Browser, enter the URLs of the Web
       Servers http://www.uniten.edu.my or http://www.example.com
     o Click on Auto Capture/Play
   - DHCP:
     o **Reset the simulation**
     o To view DHCP, on one of the Dynamic client computers, go to the Desktop
       Command prompt.
     o To have the client computer ask for new IP address and other information from
       the DHCP server, enter the command: C> ipconfig/renew
   - Email:
     o **Reset the simulation**
     o To view email, click on one of the client computers sending email to another
       client computer
     o Click on Auto Capture/Play

14. Save your work. This exercise shall be used for next lab session.