Computer Practical – Week 3

Objectives

The aim of this week's computer practical includes:

- To consolidate the understanding of TCP/IP and OSI models
- To select the appropriate cable and properly connect devices

Tasks

Accordingly, you will need to complete the following tasks in this week's computer practical class:

a. Packet Tracer - Connect a Wired and Wireless LAN
b. Packet Tracer - Connect the Physical Layer
c. Packet Tracer - Investigate the TCP/IP and OSI models

Instructions of the activities are given on the next pages.

Assessment

This week's Practical is assessed in class, and it is worth 2% of the total score of the course.

Notes:

- To be awarded marks for this computer practical, a student must attend this week's Computer Practical class and submit the following files using the "Computer Practical-Week 3-Submission" link in Week 3 section of Learnonline site:
  - The completed .pka file for Packet Tracer activity - Connect a Wired and Wireless LAN
  - The completed .pka file for Packet Tracer activity – Connect the Physical Layer
  - The Word document with your answers for Packet Tracer activity – Investigate the TCP/IP and OSI models (see page 10 for details of the Word document)
- The submission must be made in your Computer Practical class in Week 3, unless your tutor gives you the permission to submit outside the class within the day of your class.

Packet Tracer - Connect a Wired and Wireless LAN

Reminder:

a. Download from Learnonline course website (**Computer Practical-Week3 folder**) the Packet Tracer
   activity file: `wk3-computer-prac-PKA-a-Connect-LAN.pka`
b. Open the Packet Tracer activity file downloaded and set up User Profile for this PT activity.
c. Follow the instruction **given below** to complete this Packet Tracer activity.
d. Save the completed PT activity file as you will need to include it as part of your submission.

Addressing Table

Device	Interface	IP Address	Connects To
Cloud	Eth6	N/A	F0/0
	Coax7	N/A	Port0
Cable Modem	Port0	N/A	Coax7
	Port1	N/A	Internet
Router0	Console	N/A	RS232
	F0/0	192.168.2.1/24	Eth6
	F0/1	10.0.0.1/24	F0
	Ser0/0/0	172.31.0.1/24	Ser0/0
Router1	Ser0/0	172.31.0.2/24	Ser0/0/0
	F1/0	172.16.0.1/24	F0/1
WirelessRouter	Internet	192.168.2.2/24	Port 1
	Eth1	192.168.1.1	F0
Family PC	F0	192.168.1.102	Eth1
Switch	F0/1	172.16.0.2	F1/0
Netacad.pka	F0	10.0.0.254	F0/1
Configuration Terminal	RS232	N/A	Console

Objectives

Part 1: Connect to the Cloud

Part 2: Connect Router0

Part 3: Connect Remaining Devices

Part 4: Verify Connections

Part 5: Examine the Physical Topology

Background

When working in Packet Tracer (a lab environment or a corporate setting), you should know how to select the appropriate cable and how to properly connect devices. This activity will examine device configurations in Packet Tracer, selecting the proper cable based on the configuration, and connecting the devices. This activity will also explore the physical view of the network in Packet Tracer.

Part 1: Connect to the Cloud

Step 1: Connect the cloud to Router0.

a.   At the bottom left, click the orange lightning icon to open the available **Connections**.

b.   Choose the correct cable to connect **Router0 F0/0** to **Cloud Eth6**. **Cloud** is a type of switch, so use a **Copper Straight-Through** connection. If you attached the correct cable, the link lights on the cable turn green.

Step 2: Connect the cloud to Cable Modem.

Choose the correct cable to connect **Cloud Coax7** to **Modem Port0**.

If you attached the correct cable, the link lights on the cable turn green.

Part 2: Connect Router0

Step 1: Connect Router0 to Router1.

Choose the correct cable to connect **Router0 Ser0/0/0** to **Router1 Ser0/0**. Use one of the available **Serial** cables.

If you attached the correct cable, the link lights on the cable turn green.

Step 2: Connect Router0 to netacad.pka.

Choose the correct cable to connect **Router0 F0/1** to **netacad.pka F0**. Routers and computers traditionally use the same wires to transmit (1 and 2) and receive (3 and 6). The correct cable to choose consists of these crossed wires. Although many NICs can now autosense which pair is used to transmit and receive, **Router0** and **netacad.pka** do not have autosensing NICs.

If you attached the correct cable, the link lights on the cable turn green.

Step 3: Connect Router0 to the Configuration Terminal.

Choose the correct cable to connect **Router0 Console** to **Configuration Terminal RS232**. This cable does not provide network access to **Configuration Terminal** but allows you to configure **Router0** through its terminal.

If you attached the correct cable, the link lights on the cable turn black.

Part 3: Connect Remaining Devices

Step 1: Connect Router1 to Switch.

Choose the correct cable to connect **Router1 F1/0** to **Switch F0/1**.

If you attached the correct cable, the link lights on the cable turn green. Allow a few seconds for the light to transition from amber to green.

Step 2: Connect Cable Modem to Wireless Router.

Choose the correct cable to connect **Cable Modem Port1** to **Wireless Router Internet** port.

If you attached the correct cable, the link lights on the cable will turn green.

Step 3: Connect Wireless Router to Family PC.

Choose the correct cable to connect **Wireless Router Ethernet 1** to **Family PC**.

If you attached the correct cable, the link lights on the cable turn green.

Part 4: Verify Connections

Step 1: Test the connection from Family PC to netacad.pka.

a. Open the **Family PC** command prompt and ping **netacad.pka**.

b. Open the **Web Browser** and the web address **http://netacad.pka**.

Step 2: Ping the Switch from Home PC.

Open the **Home PC** command prompt and ping the **Switch** IP address of to verify the connection.

Step 3: Open Router0 from Configuration Terminal.

a. Open the **Terminal** of **Configuration Terminal** and accept the default settings.

b. Press **Enter** to view the **Router0** command prompt.

c. Type **show ip interface brief** to view interface statuses.

Part 5: Examine the Physical Topology

Step 1: Examine the Cloud.

a. Click the **Physical Workspace** tab or press **Shift+P** and **Shift+L** to toggle between the logical and physical workspaces.

b. Click the **Home City** icon.

c. Click the **Cloud** icon.

How many wires are connected to the switch in the blue rack? _____

d. Click **Back** to return to **Home City**.

Step 2: Examine the Primary Network.

a. Click the **Primary Network** icon. Hold the mouse pointer over the various cables.

What is located on the table to the right of the blue rack? _____

b. Click **Back** to return to **Home City**.

Step 3: Examine the Secondary Network.

a. Click the **Secondary Network** icon. Hold the mouse pointer over the various cables.

Why are there two orange cables connected to each device? _____

b. Click **Back** to return to **Home City**.

Step 4: Examine the Home Network.

    a.   Click the **Home Network** icon.

       Why is there no rack to hold the equipment? _____

    b.   Click the **Logical Workspace** tab to return to the logical topology.

Packet Tracer - Connect the Physical Layer

a. Download from Learnonline course website (**Computer Practical-Week3 folder**) the Packet Tracer activity file: **wk3-computer-prac-PKA-b-ConnectPhysicalLayer.pka**

b. Open the Packet Tracer activity file downloaded and set up User Profile for this PT activity.

c. Follow the instruction **given below** to complete this Packet Tracer activity.

d. Save the completed PT activity file as you will need to include it as part of your submission.

Objectives

Part 1: Identify Physical Characteristics of Internetworking Devices

Part 2: Select Correct Modules for Connectivity

Part 3: Connect Devices

Part 4: Check Connectivity

Background

In this activity, you will explore the different options available on internetworking devices. You will also be required to determine which options provide the necessary connectivity when connecting multiple devices. Finally, you will add the correct modules and connect the devices.

Note: Scoring for this activity is a combination of Packet Tracer-automated scoring and your recorded answers to the questions posed in the instructions. See the Error! Not a valid bookmark self-reference. at the end of this activity and consult with your instructor to determine your final score.

Part 1: Identify Physical Characteristics of Internetworking Devices

Step 1: Identify the management ports of a Cisco router.

a. Click the **East** router. The **Physical** tab should be active.

b. Zoom in and expand the window to see the entire router.

Which management ports are available?_____

Step 2: Identify the LAN and WAN interfaces of a Cisco router.

a. Which LAN and WAN interfaces are available on the **East** router and how many are there?

_____

b. Click the **CLI** tab, press the **Enter** key to access the user mode prompt, and enter the following commands:

East> **show ip interface brief**

The output verifies the correct number of interfaces and their designation. The vlan1 interface is a virtual interface that only exists in software.

How many physical interfaces are listed?_____

c. Enter the following commands:

East> **show interface gigabitethernet 0/0**

What is the default bandwidth of this interface?_____

```
East>  show interface serial 0/0/0
```

What is the default bandwidth of this interface? _____

Note: Bandwidth on serial interfaces is used by routing processes to determine the best path to a destination. It does not indicate the actual bandwidth of the interface. Actual bandwidth is negotiated with a service provider.

Step 3: Identify module expansion slots.

How many expansion slots are available to add additional modules to the **East** router? _____

Click **Switch2**. How many expansion slots are available? _____

Part 2: Select Correct Modules for Connectivity

Step 1: Determine which modules provide the required connectivity.

a. Click **East** and then click the **Physical** tab. On the left, beneath the **Modules** label, you see the available options to expand the capabilities of the router. Click each module. A picture and a description display at the bottom. Familiarize yourself with these options.

1) You need to connect PCs 1, 2, and 3 to the **East** router, but you do not have the necessary funds to purchase a new switch. Which module can you use to connect the three PCs to the **East** router?

_____

2) How many hosts can you connect to the router using this module? _____

b. Click **Switch2**.

Which module can you insert to provide a Gigabit optical connection to **Switch3**? _____

Step 2: Add the correct modules and power up devices.

a. Click **East** and attempt to insert the appropriate module from Step 1a. Modules are added by clicking the module and dragging it to the empty slot on the device.

The **Cannot add a module when the power is on** message should display. Interfaces for this router model are not hot-swappable. The device must be turned off before adding or removing modules. Click the power switch located to the right of the Cisco logo to turn off **East**. Insert the appropriate module from Step 1a. When done, click the power switch to power up **East**.

Note: If you insert the wrong module and need to remove it, drag the module down to its picture in the bottom right corner, and release the mouse button.

b. Using the same procedure, insert the module that you identified in Step 1b into the empty slot farthest to the right in **Switch2**.

c. Use the **show ip interface brief** command on **Switch2** to identify the slot in which the module was placed.

Into which slot was it inserted? _____

Part 3: Connect Devices

This may be the first activity you have done where you are required to connect devices. Although you may not know the purpose of the different cable types, use the table below and follow these guidelines to successfully connect all the devices:

a. Select the appropriate cable type.

b. Click the first device and select the specified interface.

c. Click the second device and select the specified interface.

d. If you have correctly connected two devices, you will see your score increase.

Example: To connect **East** to **Switch1**, select the **Copper Straight-Through** cable type. Click **East** and choose **GigabitEthernet0/0**. Then, click **Switch1** and choose **GigabitEthernet0/1**. Your score should now be 4/55.

Note: For the purposes of this activity, link lights are disabled.

Device	Interface	Cable Type	Device	Interface
East	GigabitEthernet0/0	Copper Straight-Through	Switch1	GigabitEthernet0/1
East	GigabitEthernet0/1	Copper Straight-Through	Switch4	GigabitEthernet0/1
East	FastEthernet0/1/0	Copper Straight-Through	PC1	FastEthernet0
East	FastEthernet0/1/1	Copper Straight-Through	PC2	FastEthernet0
East	FastEthernet0/1/2	Copper Straight-Through	PC3	FastEthernet0
Switch1	FastEthernet0/1	Copper Straight-Through	PC4	FastEthernet0
Switch1	FastEthernet0/2	Copper Straight-Through	PC5	FastEthernet0
Switch1	FastEthernet0/3	Copper Straight-Through	PC6	FastEthernet0
Switch4	GigabitEthernet0/2	Copper Cross-Over	Switch3	GigabitEthernet3/1
Switch3	GigabitEthernet5/1	Fiber	Switch2	GigabitEthernet5/1
Switch2	FastEthernet0/1	Copper Straight-Through	PC7	FastEthernet0
Switch2	FastEthernet1/1	Copper Straight-Through	PC8	FastEthernet0
Switch2	FastEthernet2/1	Copper Straight-Through	PC9	FastEthernet0
Switch2	Gigabit3/1	Copper Straight-Through	AccessPoint	Port 0
East	Serial0/0/0	Serial DCE (connect to East first)	West	Serial0/0/0

Part 4: Check Connectivity

Step 1: Check the interface status on East.

a. Click the **CLI** tab and enter the following commands:

```
East> show ip interface brief
```

Compare the output to the following:

```
Interface            IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0   172.30.1.1      YES manual up                    up
GigabitEthernet0/1   172.31.1.1      YES manual up                    up
Serial0/0/0          10.10.10.1      YES manual up                    up
Serial0/0/1          unassigned      YES unset  down                  down
FastEthernet0/1/0    unassigned      YES unset  up                    up
FastEthernet0/1/1    unassigned      YES unset  up                    up
FastEthernet0/1/2    unassigned      YES unset  up                    up
FastEthernet0/1/3    unassigned      YES unset  up                    down
```

```
Vlan1                 172.29.1.1      YES manual up                    up
```

If all of the cabling is correct the outputs should match.

Step 2: Connect wireless devices, Laptop and TabletPC.

a. Click the Laptop and select the **Config** Tab. Select the **Wireless0** interface. Put a check in the box labeled **On** next to Port Status. Within a few seconds the wireless connection should appear.

b. Click the **Desktop** tab of the **Laptop**. Click on the **Web Browser** icon to launch the web browser. Enter **www.cisco.pka** in the URL box and click **Go**. The page should display **Cisco Packet Tracer**.

c. Click the TabletPC and select the **Config** Tab. Select the **Wireless0** interface. Put a check in the box labeled **On** next to Port Status. Within a few seconds the wireless connection should appear.

d. Repeat the steps in Step 2b to verify the page displays.

Step 3: Change the access method of the TabletPC.

a. Click the TabletPC and select the **Config** Tab. Select the **Wireless0** interface. Uncheck the box labeled **On** next to Port Status. It should now be clear and the wireless connection will drop.

b. Click the **3G/4G Cell1** interface. Put a check in the box labeled **On** next to Port Status. Within a few seconds the cellular connection should appear.

c. Repeat the process of verifying web access.

Note: You should not have both the wireless0 interface and 3G/4G Cell1 interfaces active at the same time. This may cause confusion to the device when attempting to connect to some resources.

Step 4: Check connectivity of the other PCs.

All of the PCs should have connectivity to the web site and each other. You will learn to use connectivity testing in many upcoming labs.

Packet Tracer - Investigating the TCP/IP and OSI Models in Action

Before start:

a. **Review** the key concepts related to this Packet Trace activity by answering the following questions:
- How many layers does the OSI model have? List the names of the layers from top to bottom.
- How many layers does the TCP/IP model have? List the names of the layers from top to bottom.
- What is HTTP used for? Which layer does this protocol sit in the OSI model, and in the TCP/IP model, respectively?
- What does the acronym PDU stand for? What is a PDU?
- What are the two types of addresses a host must have in order to communicate over the Internet?

Reminder:

a. **Download** from Learnonline course website (**Computer Practical-Week3 folder**) the Packet Tracer activity file: **wk3-computer-prac-PKA-c-Investigate-TCPIP-OSI-Models.pka**

b. Open the above downloaded .pka file

c. Download from Learnonline course website (**Computer Practical-Week3 folder**) the Word file:

   wk3-computer-prac-PKA-c-instruction-questions.docx

d. Follow the instruction in the Word document to complete this Packet Tracer activity. Answer ALL questions in the word document by typing your answers in the space provided in the Word document.

e. Save the Word document with your answers and submit the Word document as part of your Week 3 computer practical submission.