# Packet Tracer - Network Representation

## Objectives

**Part 1: Overview of the Packet Tracer Program**

**Part 2: Exploring LANs, WANs, and Internets**

## Background

Packet Tracer is a fun, take-home, flexible software program which will help you with your Cisco Certified Network Associate (CCNA) studies. Packet Tracer allows you to experiment with network behavior, build network models, and ask "what if" questions. In this activity, you will explore a relatively complex network that highlights a few of Packet Tracer's features. While doing so, you will learn how to access Help and the tutorials. You will also learn how to switch between various modes and workspaces. Finally, you will explore how Packet Tracer serves as a modeling tool for network representations.

**Note**: It is not important that you understand everything you see and do in this activity. Feel free to explore the network on your own. If you wish to proceed more systematically, follow the steps below. Answer the questions to the best of your ability.

## Part 1:  Overview of the Packet Tracer Program

The network size is larger than most of the networks you will experience in this course (although you will see this topology often in your Networking Academy studies). You may need to adjust the window size of Packet Tracer to see the full network. If necessary, you can use the zoom in and out tools to adjust the size of the Packet Tracer window.

### Step 1:   Access the Packet Tracer Help pages, tutorial videos, and online resources

a.   Access the Packet Tracer Help pages in two ways:

1)   Click the question mark icon in the top, right-hand corner of the menu toolbar.

2)   Click the **Help** menu, and then choose **Contents**.

b.   Access the Packet Tracer tutorial videos by clicking **Help** > **Tutorials**. These videos are a visual demonstration of the information found in the **Help** pages and various aspects of the Packet Tracer software program. Before proceeding with this activity, you should gain some familiarity with the Packet Tracer interface and Simulation mode.

1)   View the **Interface Overview** video in the **Getting Started** section of Tutorials.

2)   View the **Simulation Environment** video in the **Realtime and Simulation Modes** section of **Tutorials**.

c.   Find the "Configuring Devices Using the Desktop Tab" tutorial. Watch the first part to answer the following question:  What information can you configure in the IP Configuration window?

### Step 2:  Toggle between Realtime and Simulation modes.

a.   Find the **Realtime** word in the bottom right corner of the Packet Tracer interface. In Realtime mode, your network is always running like a real network, whether you are working on the network or not. Your configurations are done in real time, and the network responds in near real time.

b.   Click the tab directly behind the **Realtime** tab to switch to **Simulation** mode. In Simulation mode, you can watch your network run at a slower pace, observing the paths that data takes and inspecting the data packets in detail.

c.   In the Simulation Panel, click **Auto Capture / Play**. You should now see data packets, represented as envelopes of various colors, traveling between the devices.

d.   Click **Auto Capture / Play** again to pause the simulation.

e.   Click **Capture / Forward** to step through the simulation. Click the button a few more times to see the effect.

f.   In the network topology on the left, click one of the envelopes on an intermediate device and investigate what is inside. Over the course of your CCNA studies, you will learn the meaning of most everything inside these envelopes. For now, see if you can answer the following questions:

- Under the **OSI Model tab**, how many **In Layers** and **Out Layers** have information?
- Under the **Inbound PDU Details** and **Outbound PDU Details** tabs, what are the headings of the major sections?
- Click back and forth between the **Inbound PDU Details** and **Outbound PDU Details** tabs. Do you see information changing? If so, what?

g.   Click the toggle button above **Simulation** in the bottom right corner to return to **Realtime** mode.

### Step 3:   Toggle between Logical and Physical views.

a.   Find the **Logical** word in the top left corner of the Packet Tracer interface. You are currently in the **Logical** workspace where you will spend the majority of your time building, configuring, investigating, and troubleshooting networks.

**Note:** Although you can add a geographical map as the background image for the **Logical** workspace, it does not usually have any relationship to the actual physical location of devices.

b. Click the tab below **Logical** to switch to the **Physical** workspace. The purpose of the **Physical** workspace is to give a physical dimension to your Logical network topology. It gives you a sense of scale and placement (how your network might look in a real environment).

c. During your CCNA studies, you will use this workspace on occasion. For now, just know that it is here and available for you to use. To learn more about the Physical workspace, refer to the Help files and tutorial videos.

d. Click the toggle button below **Physical** in the top right corner to return to the **Logical** workspace.

# Part 2:  Exploring LANs, WANs, and Internets

The network model in this activity incorporates many of the technologies that you will master in your CCNA studies. It represents a simplified version of how a small to medium-sized business network might look. Feel free to explore the network on your own. When ready, proceed through the following steps and answer the questions.

## Step 1:  Identify common components of a network as represented in Packet Tracer.

a. The Icon toolbar has various categories of networking components. You should see categories that correspond to intermediate devices, end devices, and media. The **Connections** category (with the lightning bolt icon) represents the networking media supported by Packet Tracer. There is also an **End Devices** category and two categories specific to Packet Tracer: **Custom Made Devices** and **Multiuser Connection**.

b. List the intermediate device categories.

c. Without entering into the Internet cloud or Intranet cloud, how many icons in the topology represent endpoint devices (only one connection leading to them)?

d. Without counting the two clouds, how many icons in the topology represent intermediate devices (multiple connections leading to them)?

e. How many intermediate devices are routers? Note: The Linksys device is a router.

f. How many end devices are **not** desktop computers?

g. How many different types of media connections are used in this network topology?

h. Why isn't there a connection icon for wireless in the Connections category?

## Step 2:  Explain the purpose of the devices.

a. In Packet Tracer, the Server-PT device can act as a server. The desktop and laptop PCs cannot act as a server. Is that true in the real world?
   Based on your studies so far, explain the client-server model.

b. List at least two functions of intermediary devices.

c. List at least two criteria for choosing a network media type.

## Step 3:  Compare and contrast LANs and WANs.

a. Explain the difference between a LAN and a WAN. Give examples of each.

b. In the Packet Tracer network, how many WANs do you see?

c. How many LANs do you see?

d. The Internet in this Packet Tracer network is overly simplified and does not represent the structure and form of the real Internet. Briefly describe the Internet.

e. What are some of the common ways a home user connects to the Internet?

f. What are some common methods that businesses use to connect to the Internet in your area?

# Challenge

Now that you have had an opportunity to explore the network represented in this Packet Tracer activity, you may have picked up a few skills that you would like to try out. Or maybe you would like the opportunity to explore this network in more detail. Realizing that most of what you see and experience in Packet Tracer is currently beyond your skill level, here are some challenges you might want to attempt. Do not worry if you cannot do them all. You will be a Packet Tracer master user and network designer soon enough.

• Add an end device to the topology and connect it to one of the LANs with a media connection. What else does this device need to send data to other end users? Can you provide the information? Is there a way to verify that you correctly connected the device?