

CSC 524 Computer Networks, Spring 2020
Instructor: Dr. Natarajan Meghanathan

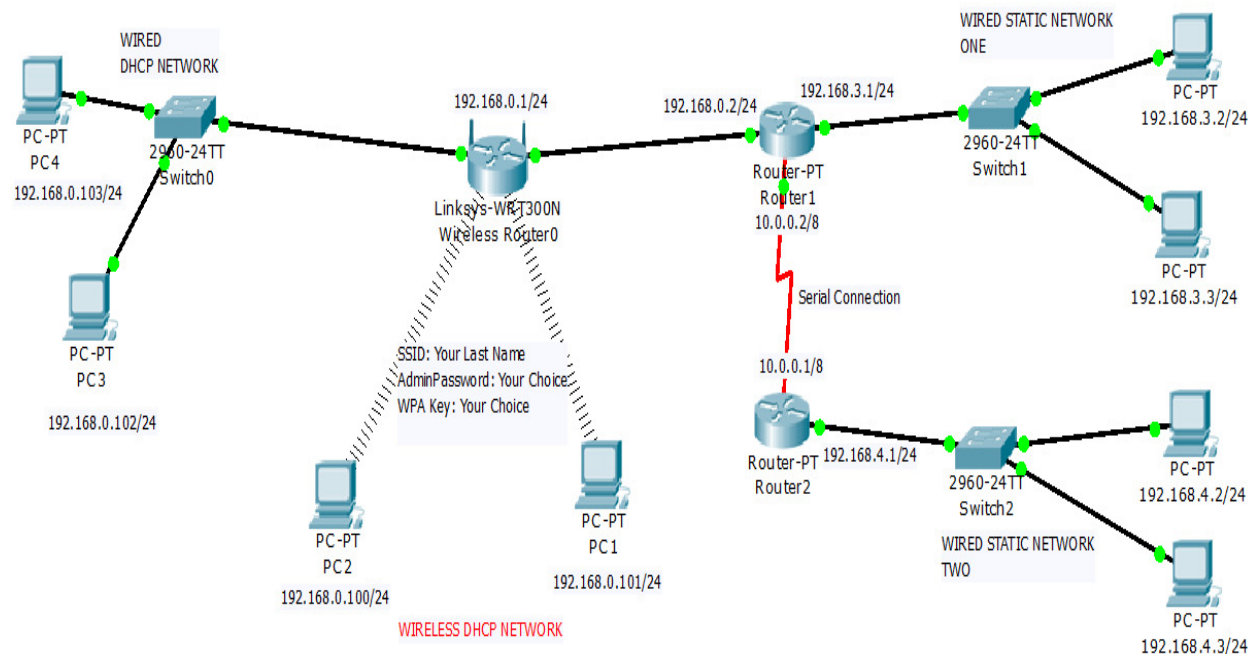
Assignment 4: Simulation using Cisco Packet Tracer
Linksys Wireless Router Configuration and Multi-Hop Network Communication

Due: April 2nd, 2020, by 11.59 PM **Max. Points:** 100

Use the same Cisco Packet Tracer software that you used for Quiz 4. If you do not have it, you can download/ install it from http://143.132.8.23/cms/nmeghanathan/docs/PacketTracer533_setup.exe

Refer to the figure below for the configuration and connection details. The entire project description is based on some sample IP addresses and Network Address ranges that are used to illustrate the steps to do. Each student is assigned a range of IP addresses for DHCP and static IP addresses for the different networks as shown in the figure and tables (corresponding to the sample ones used in the network layout).

Network Layout (the IP addresses and address ranges specified in the figure below correspond to the sample values mentioned in the table below)



Sample IP addresses and Network Address ranges:
 (all addresses and ranges use a 24-bit subnet mask, unless otherwise explicitly mentioned)

Linksys router IP address	Wireless and Wired DHCP Network Address Range	Wired Static Network ONE Address Range	Wired Static Network TWO Address Range	Serial Network Router IP Addresses	Router R1's IP address on the Interface connecting to the Linksys router
192.168.0.1	192.168.0.100 to 192.168.0.149	192.168.3.1 to 192.168.3.3	192.168.4.1 to 192.168.4.3	10.0.0.1/8 10.0.0.2/8	192.168.0.2

Project Phases:

Phase 1: You will first setup the Linksys Wireless Router and configure its settings as indicated below and shown in Video 1. You will then configure two laptops to obtain IP addresses from the Linksys router through DHCP (in the range assigned to each student).

Phase 2: You will setup a Wired Network (comprising of Switch0 and two PCs); connect Switch0 to the Linksys router; Setup the PCs to obtain the dynamic IP addresses from the Linksys router

Phase 3: Setup the two wired networks (comprising of Switch1 and two PCs; Switch2 and two PCs); connect Switch1 to router R1 and Switch2 to router R2. Connect R1 and R2 using a serial cable. Router R1 is also connected to the Linksys router.

Outline of the Procedure: You will go through four videos that will demonstrate similar examples. After learning the procedures through these videos, you could then start doing the project.

Read the procedure described below carefully and make sure to record the steps as you demonstrate your project

Phase 1:

Look at Video 1: <http://www.youtube.com/watch?v=G8oWi6bJ3gI>

To setup a wireless network with the Linksys router

Change the administrative IP address of the linksys router to the value assigned to you and configure the DHCP address range to the range assigned to you.

1)

Set the SSID name: (depending on your lastname)

Username: admin

Change the password (your choice)

Set the WPA key also according to your choice

2) Show that your laptop got the new IP address using DHCP

Connect to the Linksys server (through the web server) using the new IP address

3) Use the Wireless web configuration tool in the PC to change the name of the SSID to the new name; and the security settings (in the Web browser tool of the Linksys router).

Show your connection to the linksys wireless router using the PC Wireless configuration tool and obtain an IP address

Phase 2:

Look at Video - 2: <http://www.youtube.com/watch?v=FVDTYJhJVds>

Set up a network of two PCs connected to a switch (Switch0), which is in turn connected to the Linksys router. The two PCs should obtain an IP address from the Linksys router using DHCP.

You should show that you are able to ping between the two PCs as well as from the PC to a wireless laptop that is directly connected to the Linksys router.

Phase 3:

Look at the two practice videos 3 and 4

Video 3: <http://www.youtube.com/watch?v=wwUT7mfuTl4>

To route between two machines directly connected to a router

Video 4: <http://www.youtube.com/watch?v=TP0IWOQSVVU>

To setup Routing Tables at the Routers to Communicate between two Networks

Set up two more separate wired networks (each network has a switch with two PCs). In Videos 3 and 4, we connected the PCs directly to a router. In this project, you will connect the two PCs to a switch as shown in the right hand side of the Network layout (Page 1) and connect the switches to a router as shown. The two routers (attached to each of the two wired networks) are connected using a serial cable (the red color cable line shown in the figure).

Connect these two networks to the Linksys router through the routers as shown in the figure. Look at Video 4 on how to configure the routers to facilitate these two networks. The two PCs in each of these two wired networks should get a static IP address in the range assigned to you.

Tests to be Demonstrated:

Show that you can ping from:

- (a) A machine in Wired Static Network TWO to a machine in Wired Static Network ONE
- (b) A machine in Wired Static Network ONE to a machine in Wireless DHCP Network
- (c) A machine in Wired DHCP Network to a machine in Wireless DHCP Network
- (d) A machine in Wired DHCP Network to a machine in Wired Static Network TWO

Student ID and Student Names (to refer to the values assigned for IP addresses and Address ranges)

ID	Student Name	ID	Student Name	ID	Student Name
1	Addy, James	7	Holmes, Shaquan	13	Valliappan, Vallimanlan
2	Boyd, Ronnal	8	Jackson, Cameron	14	Ward, Craig
3	Collins, Deunta	9	Lewis, Devario	15	Whitfield, Nicholas
4	Dave, Hitanshu	10	McBride, Tony	16	Williams, Brian
5	Deanes, Marcus	11	Sims, Kandice		
6	Gomes, Anthony	12	Smith, Morgan		

IP Addresses and Network Address Ranges assigned to students

(all addresses and ranges use a 24-bit subnet mask, unless otherwise explicitly mentioned)

ID	Linksys router IP address	Wireless and Wired DHCP Network Address Range	Wired Static Network ONE Address Range	Wired Static Network TWO Address Range	Serial Network Router IP Addresses	Router R1's IP address on the Interface connecting to the Linksys router
1	192.168.10.1	192.168.10.100 to 192.168.10.149	192.168.13.1 to 192.168.13.3	192.168.14.1 to 192.168.14.3	10.0.0.1/8 to 10.0.0.2/8	192.168.10.2
2	192.168.20.1	192.168.20.100 to 192.168.20.149	192.168.23.1 to 192.168.23.3	192.168.24.1 to 192.168.24.3	10.0.0.1/8 to 10.0.0.2/8	192.168.20.2
3	192.168.30.1	192.168.30.100 to 192.168.30.149	192.168.33.1 to 192.168.33.3	192.168.34.1 to 192.168.34.3	10.0.0.1/8 to 10.0.0.2/8	192.168.30.2
4	192.168.40.1	192.168.40.100 to 192.168.40.149	192.168.43.1 to 192.168.43.3	192.168.44.1 to 192.168.44.3	10.0.0.1/8 to 10.0.0.2/8	192.168.40.2

		to 192.168.40.149	to 192.168.43.3	to 192.168.44.3	10.0.0.2/8	
5	192.168.50.1	192.168.50.100 to 192.168.50.149	192.168.53.1 to 192.168.53.3	192.168.54.1 to 192.168.54.3	10.0.0.1/8 10.0.0.2/8	192.168.50.2
6	192.168.60.1	192.168.60.100 to 192.168.60.149	192.168.63.1 to 192.168.63.3	192.168.64.1 to 192.168.64.3	10.0.0.1/8 10.0.0.2/8	192.168.60.2
7	192.168.70.1	192.168.70.100 to 192.168.70.149	192.168.73.1 to 192.168.73.3	192.168.74.1 to 192.168.74.3	10.0.0.1/8 10.0.0.2/8	192.168.70.2
8	192.168.80.1	192.168.80.100 to 192.168.80.149	192.168.83.1 to 192.168.83.3	192.168.84.1 to 192.168.84.3	10.0.0.1/8 10.0.0.2/8	192.168.80.2
9	192.168.90.1	192.168.90.100 to 192.168.90.149	192.168.93.1 to 192.168.93.3	192.168.94.1 to 192.168.94.3	10.0.0.1/8 10.0.0.2/8	192.168.90.2
10	192.168.100.1	192.168.100.100 to 192.168.100.149	192.168.103.1 to 192.168.103.3	192.168.104.1 to 192.168.104.3	10.0.0.1/8 10.0.0.2/8	192.168.100.2
11	192.168.110.1	192.168.110.100 to 192.168.110.149	192.168.113.1 to 192.168.113.3	192.168.114.1 to 192.168.114.3	10.0.0.1/8 10.0.0.2/8	192.168.110.2
12	192.168.120.1	192.168.120.100 to 192.168.120.149	192.168.123.1 to 192.168.123.3	192.168.124.1 to 192.168.124.3	10.0.0.1/8 10.0.0.2/8	192.168.120.2
13	192.168.130.1	192.168.130.100 to 192.168.130.149	192.168.133.1 to 192.168.133.3	192.168.134.1 to 192.168.134.3	10.0.0.1/8 10.0.0.2/8	192.168.130.2
14	192.168.140.1	192.168.140.100 to 192.168.140.149	192.168.143.1 to 192.168.143.3	192.168.144.1 to 192.168.144.3	10.0.0.1/8 10.0.0.2/8	192.168.140.2
15	192.168.150.1	192.168.150.100 to 192.168.150.149	192.168.153.1 to 192.168.153.3	192.168.154.1 to 192.168.154.3	10.0.0.1/8 10.0.0.2/8	192.168.150.2
16	192.168.160.1	192.168.160.100 to 192.168.160.149	192.168.163.1 to 192.168.163.3	192.168.164.1 to 192.168.164.3	10.0.0.1/8 10.0.0.2/8	192.168.160.2
17	192.168.170.1	192.168.170.100 to 192.168.170.149	192.168.173.1 to 192.168.173.3	192.168.174.1 to 192.168.174.3	10.0.0.1/8 10.0.0.2/8	192.168.170.2
18	192.168.180.1	192.168.180.100 to 192.168.180.149	192.168.183.1 to 192.168.183.3	192.168.184.1 to 192.168.184.3	10.0.0.1/8 10.0.0.2/8	192.168.180.2
19	192.168.190.1	192.168.190.100 to 192.168.190.149	192.168.193.1 to 192.168.193.3	192.168.194.1 to 192.168.194.3	10.0.0.1/8 10.0.0.2/8	192.168.190.2
20	192.168.200.1	192.168.200.100 to 192.168.200.149	192.168.203.1 to 192.168.203.3	192.168.204.1 to 192.168.204.3	10.0.0.1/8 10.0.0.2/8	192.168.200.2

Video Recording and Submission

Record the sequence of steps you do for the project in Phase 1, 2, 3 and the tests to be demonstrated. If your recording runs for a longer time, you could record it as separate videos. Clearly label the video file(s) and then upload in Google Drive.

Share the link to my email address: natarajan.meghanathan@jsums.edu