

**Station 1: IP Addresses**

*Reading response questions: The Wikipedia article in IP Addresses*

1. What are 2 differences between IP version 4 and IP version 6 IP addresses?  
*one:*

*two:*

2. Describe WHY the shift from version 4 to 6 is needed?

4. Write down three different IP addresses that could NEVER be reached over the internet? (i.e. they are private addresses)

*IP Address record*

<b>Location</b>	<b>Computer Name/number/id</b>	<b>IPv4 Address on CCAC's network</b>
Location 1:		
Location 2:		
Location 3:		

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*Station 1 continued:*

**Summary question 1:** Analyze the patterns in the IP addresses you looked up: Describe the patterns you've found.

**Summary question 2:** Revisit the wikipedia article on networking and read the section on Subnetworks. Also read the introduction to the article on subnetworks. NOW: What inferences can we make about the subnetwork configuration of computers at CCAC West Hills based on analyzing the IP Addresses given to computers in various locations? Draw a picture or diagram of your network based on your investigations:

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## **Station 2: Wireshark**

*Pre-reading questions about the Wireshark tool*

What does wireshark do?

Who created the initial version of this tool and why?

Jump to chapter 5 on Live capture: What does it mean to choose an interface to capture?

Which interfaces are available to capture on the computer setup in front of you?

Frame exploration tracker:

Source PORT	Destination PORT	Name of protocol	After researching: What is this protocol used for?

### Station 3: 5 Cats

*Reading comprehension questions from wikipedia article category\_5\_cable*

1. How many strands of copper are contained inside a Cat-5 cable?
2. List the pin order and the color of cable for the "T586A" configuration?
3. Describe what is meant by "crosstalk" and how the phenomenon of crosstalk is related to the design of twisting pairs of copper strands inside the cable.
4. What is the actual connector called into which we feed the copper wire strands?

## Station 4: Routing Routers

Reading comprehension questions from Wikipedia article:

[https://en.wikipedia.org/wiki/Router\\_\(computing\)](https://en.wikipedia.org/wiki/Router_(computing))

**1. What role does a router play in a computer network?** (Request from your brain: generate your own words after reading the reference material)

**2. What might happen is a routing table is populated incorrectly?** (Use the following terms in your answer: packet, source, destination, route, toast)

3. Learn about **two other concepts interesting to you** by reading the introductory paragraphs of two articles linked in our main article called *Router (computing)*.

Concept 1:

Concept 2:

-----NOW JUMP INTO THE LAB PORTION!-----

**4. What is the IP address, MAC Address, and device name of the pi computer as registered by the router?** Input this info in the attached devices table below as found in your router config page.

### Attached devices table

#	IP Address	MAC Address	Device Name
1			
2			

**5. Access the pi's network adapter configurations** using the station guide online. Record your findings below:

eth0	Link encap:		HWaddr:	
	inet addr:	Bcast:	Mask:	
	status:			
	RX packets:			
	TX packets:			
	RX bytes:		TX bytes:	

**6. Access TWO more pages on the router's configuration settings**, and re-run ifconfig. How many packets were received over that interface to load those pages? How many packets were transmitted? (Compare the RX and TX packet numbers from your two runs of ifconfig)

RX:

TX:

5. Disconnect one of the Dell All-in-one computers from the CCAC network and instead patch it into another port on the rear of the Netgear router. Once you've connected the machine, run the ipconfig on the windows command prompt and verify that it matches the router's Attached Devices table.

Do the values match?

**6. With two computers on your network, run the ping [ip address]** tool on each machine, directing the ping at the other system on the network. Then read about ping on wikipedia via [https://en.wikipedia.org/wiki/Ping\\_\(networking\\_utility\)](https://en.wikipedia.org/wiki/Ping_(networking_utility))

How many bytes does the Linux ping command use to bounce off the other system?

What was the shortest and longest reply time from the Linux machine (the pi) to the Dell Windows box?

*shortest reply:*

*longest reply:*

How many bytes does the Windows ping send by default?

In a few sentences, compare the output you get from Windows ping and the Linux ping program:

**7. Draw a network schematic** of your little network with the Netgear router. Include the three network devices (two computers and the router) and each one's IP address (don't forget the Router's own IP address)