

# Lab 09: Building a Network

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## BACKGROUND INFORMATION

In this activity, you will follow the instructions to build a basic network that makes use of a small route. Your team will build a network using the components in the provided activity kit. Once your network is built and configured, someone from the Instructional Team will bring a Raspberry Pi or their laptop over to verify that your network is working properly. As usual, you will be rewarded with a bad meme if your network is working correctly.

## Activity Kit Inventory

The kit that you have been provided includes the following items. 1 wired Ethernet switch

- 2 CAT6 Ethernet cables
- 1 Ethernet switch
- 1 Router
- 1 USB-A Networking Adapter
- 1 USB-C Networking Adapter
- 1 large rechargeable USB battery
- 1 plastic toolbox

After you have completed the activity, make sure to return all components to the provided toolbox. Remove all cables from the devices and neatly coil any cables to allow everything to fit in the container without any stresses being placed on the equipment.

## Directions: Creating the Network

Before starting this activity, you should identify among your team the two individuals whose laptops will become part of the network and who will keep their computers connected to the campus network. If your laptop is not part of the network, then your role is to act as a researcher to help your teammates figure out how to accomplish each of the steps below.

Step 0: Choose one of your teammates' laptops to use. The others should assist by reading instructions, searching for any additional information that might be required, and one person should take notes about your effort.

Step 1: Look at your laptop. Does it have networking ports? If not, then plug in the provided networking adapter.

Step 2: Plug the one end of each of the two CAT6 Ethernet cables into the Ethernet switch. There should now be two cables plugged into the switch and each cable should have one end free.

Step 3: Plug the free end of one cable into the laptop's networking port. Plug the other cable into the Router's LAN port.

Step 4: Power up the Ethernet switch and the Router by using the provided USB battery. The battery has a built-in cables that will plug directly into these devices. Be gentle, these cables have turned-out to be very fragile.

Step 5: Turn off the wireless network adapter on your laptop.

Step 6: Go to <https://192.168.8.1> in a browser (like Chrome, Safari, or Firefox).

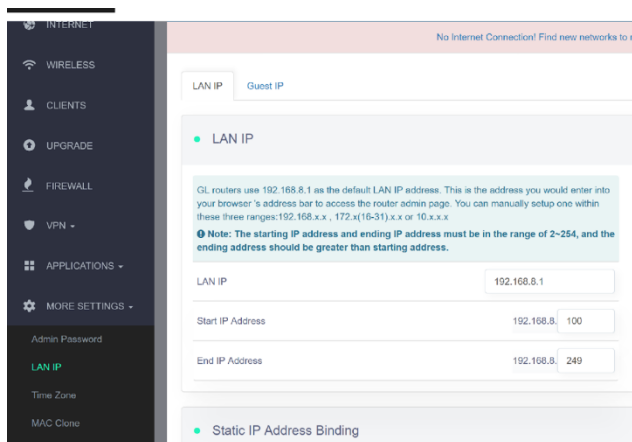
Step 6a: If it asks for a password, follow the instructions it provides for resetting the device.

Step 6b: Choose “English” and hit next.

Step 6c: Create the password “inst346”

Step 6d: Login to the Router using the password “inst346”

Step 7: Expand “More Settings” and select “LAN IP”. You should see the following screen.



Step 7a: Change the LAN IP to 10.0.x.1 where x is the number written in silver marker on your toolkit. Apply this setting change.

Step 7b: Now you will have to go to that new IP address to access the router. So, log back in. It might take a little time for your laptop to get a new IP address from the router.

Step 8: Look around the router to see what other settings and features this tiny router can provide.

Step 9: Let the professor know you are ready. Depending on how much time is left, we might get a little experimental with the next part.

Step 10: One of two things might happen.

Option 1: There isn't enough time and I plug my computer into your network so you can attempt to go to my computer's web service.

Option 2: We try to get all the networks connected together to see what happens and hopefully we are successful, and you can access my computer's web service.

Step 8: Celebrate! . . . .

Step 9: Undo everything that you did. This means:

Step 9a: Turn the laptops' wireless adapter back on. (Make sure that you can connect to eduroam!)

Step 9b: Ethernet cables have tabs on the connector that must be pressed to release the cable from the port. Don't YANK! Squeeze the tab and gently unplug the Ethernet cable from the laptop. If you used an USB networking adapter, unplug that from your laptop and put it in the toolbox.

Step 9c: Squeeze the tabs and gently unplug the Ethernet cables from the switch.

Step 9d: Loosely coil the Ethernet cable so that it fits back in the toolbox.

Step 9e: Unplug the USB battery from the switch.

Step 9f: Put the switch and the USB battery in the toolbox and close the lid securely.

Step 10: Answer the questions in the questions section.

## Questions

1. Before changing the IP for your router you might have noticed this warning in the following image. What is special about those three IP ranges and why do they specify that the start and end IP addresses must be between 2 and 254.

LAN IP

Guest IP

LAN IP

GL routers use 192.168.8.1 as the default LAN IP address. This is the address you would enter into your browser's address bar to access the router admin page. You can manually setup one within these three ranges: 192.168.x.x, 172.16.x(16-31).x.x or 10.x.x.x

**Note:** The starting IP address and ending IP address must be in the range of 2~254, and the ending address should be greater than starting address.

LAN IP

192.168.8.1

Start IP Address

192.168.8.

100

End IP Address

192.168.8.

249

Those three IP ranges are the private IP address codes that allow people to create private networks. The range does not include 1 because that is the LAN IP code. Furthermore, the range does not include 255 because those are reserved for masking/broadcast.

2. What is the physical & logical topology of the network you just created? Is this different than last time (Lab 06)?

This network is a physical and logical star topology. This was the same set up as last time.

3. Step 10 had two possible outcomes. Did we get the networks connected? If you were able to connect to my webserver, then provide a screenshot. Otherwise describe what might have been the problem.

Hello, INST346!

Your IP address is: 172.17.0.1



We got the networks connected and received the welcome message with the meme and IP address.

4. What were some features of the Router that you found interesting or wanted to learn more about.

The fact that it's battery powered, I wonder if that could be an alternative to using hotspot as some phone plans don't offer that option. Also we have already tried making a network between computers but we found it interesting how the router on the conceptual level could represent millions of computers in the network(which is the whole internet).

USB port, Wide access network port, Antenna

So many capabilities in that tiny box, but I guess not more impressive than our phones.