# Lesson Plan 3 | Form 2 | Basic Commands on Lab-wide Network

## Objective

Students will be introduced to basic networking commands in the context of a single, lab-wide wireless network.

## Warm-up

None.

## Presentation

First, point out the labels on the laptops to the students. Each laptop lid is labeled with the laptop's IP address (mapped to its MAC address at the router) and its hostname (mapped to its IP address in /etc/hosts). Tell the students to turn on their laptops, then ensure that they are connected to the TSSSComputerLab wireless network. Some may not connect automatically, so show those students how to connect manually.

First, have students run **ifconfig** and check to see that the IP address assigned to their wireless interface matches the IP address on the laptop.

Have students run **man route** to read about the route command. Then have them run **route** to view the IP routing table. Point out the first line of default, and ask them what the gateway IP address is. Have them see that everyone has different IP addresses, but all have the same gateway IP address.

Now, have students run **man ping** to read about the ping command. Then have them run **ping 192.168.1.1** to ping the gateway, followed by **ping <ips_of_neighbors>** to ping their friends. Also ask them to ping a nonexistent IP address (i.e., 192.168.1.145) to see what error they get.

**The following requires wireless network with Internet:**

Insert an Internet-enabled SIM card into the router. While the router connects to the Internet, have students run **man host** to read about the host command. Then have students run **host tanzania.go.tz** to show the IP address for Tanzania's government website.

## Guided Practice

None.

## Independent Practice

None.

## Closing

Remind students that they need to know the difference between a gateway IP address and their own IP address. They may be asked which command to use to see the various IP addresses assigned to

their computer (**ifconfig**), the command to view where the computer can send messages (**route**) the command to see if another computer is connected to the network (**ping**), and the command to find out the IP address used by a DNS domain name (**host**).

**In Hindsight**

01/23/2017: I originally intended to also introduce the **dig** command, but ended up feeling that it was unnecessary, since **dig** is just a more advanced superset of **host**. The Internet wouldn't cooperate for one stream, so  I showed students **host** on my computer, then let them do self-directed experimentation for the remainder of class. For the stream that did have Internet, I gave them half an hour to find the IP addresses of various hostnames and ping other IP addresses / hosts. In the future, **traceroute** would be good to show them.