**Packet Passing**

The packet passing exercise is meant to give students an analog experience as to how computers send data over a network. It shows how data is passed up and down the OSI stack, and how devices send packets to one another.

Each device and application is represented by a student. More computers and applications can be added or removed as needed depending on the number of students. A picture at the end of this document shows what a student ‘network’ sho

**Supplies**

* Writing utensils (pens, pencils, markers, etc)
* Scratch paper

**Student Roles**

* Computers
* Applications
  + Facebook
  + Minecraft
  + Skype
* Users

**Break Activity**

Basically pass notes

**Class Activity**

A student (User 1) wants to send a message via Skype to their friend (User 2). User 1 writes ‘Hello!’ on a piece of paper, fold it closed, writes ‘To User 2, From User 1’’ on the outside, and hands it to the student acting as Skype.

Skype then wraps the message in a piece of paper and writes on the outside ‘To Computer, From Computer’ and hands it to the student acting as the computer.

The computer then ‘looks’ at the network, and ask other computers if any of them have a ‘User 2’, if they do, the responding computer give the asking computer it’s IP address. And the asking computer adds ‘User 2 = 10.0.0.2’ to it’s table on a separate piece of paper.

The computer then gets User 2’s IP address using its table, wraps the message in another piece of paper, and writes ‘To 10.0.0.2, From 10.0.0.1’’ and hands it to the recipient computer.

The process is then reversed on the other end with the receiving computer removing the first layer and handing it to Skype, who then takes off the next layer and hands it to User 2. The end user should then be given an ‘open’ message saying ‘Hello!’

Each step of the process is only done by the ‘layer’ that is allowed to read-and-write ‘data’ to the packet (i.e. computer can only remove computer wrap, not skype wrap).

If the information isn’t correct, or is illegible, the packet contains ‘errors’ should be discarded, as it would be in a real network.

The exercise should start off slow, and is done for a few packets at first to allow students to get familiar with the process, then sped up later to test their ability and efficiency. Packets with errors (non-existent user, wrong application, etc) can be used to show how bad network traffic is dropped and can overwhelm a computers or applications by making it waste time and resources by having to ‘process’ i.e. unwrap and read packets that aren’t important.

The picture below can be used as a network ‘topology’ reference