Tan Shun Yu ISTD 1001171

Networks Lab 1 Submission

Your local machine IP address, and Mask:

IP Address: 10.13.11.235

Subnet Mask: 255.255.0.0

Alternative Representation: 10.13.11.235/16

Using tracepath, what is your estimate on the "border" between the SUTD network and the Internet?

The estimate on the "border" will be either at 192.168.22.27 or 202.94.70.1. This is because that these two IP addresses might be referring to the same device, but just that one is within the internal network and the other is within the external network (that is facing the Internet). It is also possible that network address translation (NAT) is used to translate one to the other.

Can you give an example for a link through an underwater cable?

One of the links through an underwater cable will be at i-0-4-0-6.eq1a01.bi.telstraglobal.net, which is indicated by the change in the domain as well as a spike in the round-trip time (in ms) compared to the timings before that. With a further google search on Telstra, I verified that it owns some undersea cables in and out of Singapore, thus confirming the link through an underwater cable.

Do you experience link loss? Why/why not?

No for the first 13 hops or so (using *tracepath*). The connection to the SUTD Student wireless network was fairly stable without network congestion, which might be one of the causes of link/packet loss.

However, after the first 13 hops, my local machine starts to get no responses from the ICMP packets being sent out. This indicates that there is a possibility that the subsequent routers after the first 13 are limiting/blocking the responses it sends to ICMP packets in an effort to mitigate DoS attacks, or to save on processing power to make way for 'real' traffic by giving lower priority to ICMP packets.

A brief summary of your experience with the LAN setup using the switch. What worked, what did not work?

To be able to ping other hosts, we have to be connected to the same network. This applies when multiple machines are connected to the same switch, and also by connecting your switch to other switches (which in turn is connected to other users of that switch). This is tested by running the *ping IP_ADDRESS* command where IP_ADDRESS is the IP address chosen by another machine connected to the same network, and the ping command returns a valid response with replies and very short RTT of average 0.388ms from the machine at the IP address pinged.

Things started to go wrong when the same static IP address is used by two machines, A and B (connected to the same network). An IP conflict occurs, and on a Windows machine one will get the error message "There is an IP address conflict with another system on the network". On the LEET Lab Ubuntu machine, I tried a simple *ping* test from another (non-conflicted) Ubuntu machine to that IP address and it still returned a valid response, but I am unable to determine the real identity of the machine providing that response (if it is A or B). This shows that it is difficult to identify affected systems using ping utility.

To bring the concept away from the context of a LAN, if these two machines A and B are connected to the Internet with an IP conflict, they will not be able to access the Internet or have intermittent connections, which is undesired. The most common way now to prevent this is using DHCP to automatically assign dynamic IP addresses to machines connecting to the network.