CSG 1105 / 5130 - Packet Tracer Simulation Guide

Simulations
Single Packet Simulation
1. Enter Simulation Mode
2. Open your source workstation (the one sending the packet)
3. Go to the 'Desktop' tab and open 'Command Prompt'
4. Type in `ping x.x.x.x` and replace the x's with the destination IP address, press enter
5. Click on 'Auto Capture/Play' and speed it up to a comfortable speed
6. Analyse the network behaviour and consider the questions below.

Multi-Packet Simulation
1. Do steps 1-4 of the above
2. Repeat steps 1-4 of the above with different source and destination workstations
3. Do steps 5 & 6

Questions to Consider
1. Did the communication work at first?
2. What protocols of packets were being sent?
3. If the communication didn't work at first, did it eventually work? If yes, why?

Key Protocols In Use
This list will be updated throughout the semester week by week as new protocols are looked into and discussed. It is recommended you download this whenever the Tutorial documentation says to do so.

ARP - Address Resolution Protocol
ARP is a broadcast protocol which allows devices to relate the physical address (MAC address) of a connected port to it's logical address (IP address) and stores it in an ARP table, it can then use this to address any packets sent in the appropriate manner. ARP is a broadcast packet and does not cross network boundaries (gateways) unless the gateway has been configured to allow it.

ICMP - Internet Control Message Protocol
ICMP is a unicast protocol for networking devices and end devices to send error messages indicating that a service is not available or a host or router could not be reached. It is not typically used to transmit data like TCP and UDP. It is commonly seen when using *ping* and *traceroute*.

DHCP - Dynamic Host Configuration Protocol
DHCP is a broadcast protocol which automatically leases out IP addresses to network enabled devices which send out a request for one. It has the ability to reserve IP addresses, or ranges of IP addresses for multiple purposes such as a statically set IP address (for a server as an example), or to limit the pool available. It enables a network to be dynamic and removes the need for the network administrator to manually assign every IP address in use.

DNS - Domain Name System Request
DNS is a unicast protocol which allows the translation of a human readable address (such as **www.google.com**) to a logical address where by HTTP traffic or other traffic can then be conducted once a source and destination logical address connection has been created.

HTTP - Hypertext Transfer Protocol
This is a unicast application level protocol for distributed, collaborative, hypermedia information systems. It allows the transfer of websites and files across the internet. It is the exchange or transfer of hypertext.