Computer Networks, Spring 2026

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Lab 4: Networking Setup, File Transfer, and IP Helpers

In this lab, you will configure static IPs, perform simple file transfers, and observe the behavior of ARP and DHCP protocols. *This lab can be done individually or in pairs.*

1 Manual IP Configuration

1. Connect two computers directly. Configure static IP addresses in the same subnet (e.g., `192.168.1.1` and `192.168.1.2`) with a `/24` mask.
2. Verify connectivity using `ping`.
3. Perform a simple file transfer using a tool like `netcat (nc)`.
   - Receiver: `nc -l -p 1234 > received_file`
   - Sender: `nc <IP_of_receiver> 1234 < file_to_send`

2 ARP Exploration

While the computers are connected:

1. Clear your ARP cache: `sudo ip neigh flush all` (or similar).
2. Start Wireshark. Perform a `ping` to the other computer.
3. Observe the ARP Request and Reply.
4. Does the ARP Request use Broadcast or Unicast? What about the Reply?
5. View your ARP table using `arp -n` or `ip neigh show`.

3 DHCP Observation

Connect your computer to the laboratory network (which uses DHCP).

1. Start a Wireshark capture with the filter `bootp` or `dhcp`.
2. Release and renew your IP: `sudo dhclient -r && sudo dhclient`.
3. Identify the four DHCP stages: Discover, Offer, Request, and ACK.
4. What is the transaction ID? Is it the same for all four messages?
5. What is the IP address of the DHCP server that offered you the lease?

4 Evaluation

☐ Can configure static IP and transfer file via netcat. TA: _____

☐ Can explain the ARP resolution process. TA: _____

☐ Successfully captured all four stages of DHCP. TA: _____