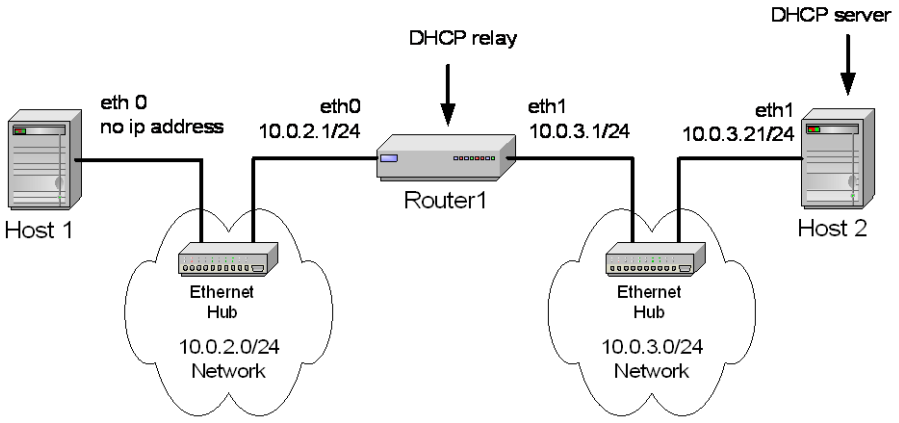
ECE 461 – Internetworking

Problem Set 8

Problem 1. In the figure below, Host1 is a DHCP client, Host 2 is a DHCP server. Router 1 is an IP router (i.e., IP forwarding is enabled), that is also configured as DHCP relay server.



a. *(4 Points)* Explain why Router1 needs to be configured as a DHCP relay server.

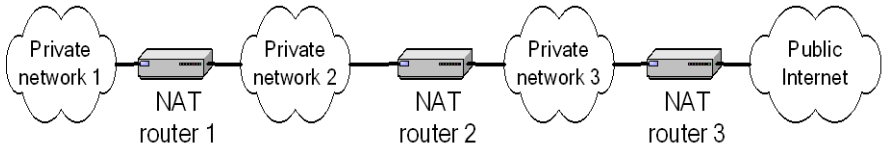
b. *(3 Points)* Describe how the relay server processes and directs a DHCP Discovery from Host 1 and the DHCP Offer to Host 1. Does the DHCP relay server modify the IP headers of the DHCP packets?

c. *(3 Points)* List the IP source and destination addresses in the DHCP Discovery and the DHCP Offer. If the addresses are changed at Router1, show the original and the modified addresses.

Problem 2. Consider a home network with a router that performs IP masquerading ("NAT router").

a. Normally, the NAT router assigns experimental IP addresses to the hosts in the home network. Explain the consequences (good and bad) if the NAT router assigns IP addresses which are not experimental.

b. Suppose a home network is set up with multiple cascaded NAT routers, as shown in the figure. Can such a configuration work? Explain.



c. NAT routers that perform IP masquerading support the use of "ping" from the internal to the external network. Why is this an issue, and how is it resolved?