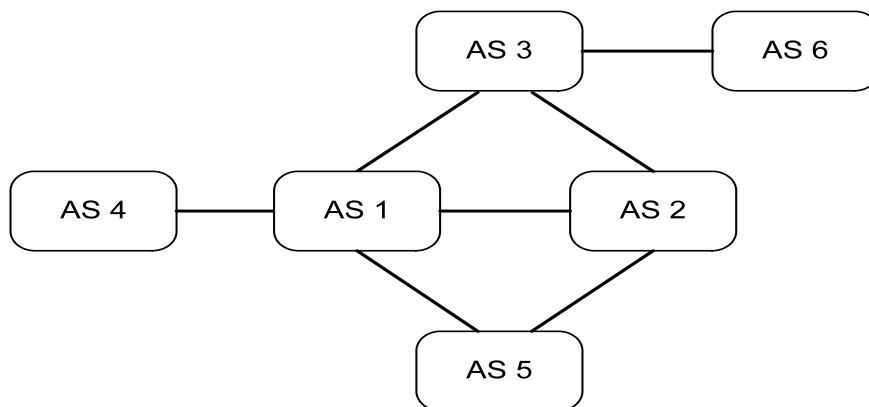


**ECE 461 – Internetworking
Fall 2009**

**Problem Set 7
Solutions**

Problem 1.

The figure shows a network with six autonomous systems. AS4 “owns” the prefix 10.0.1.0/24 and sends an advertisement to AS1 with the following prefix, and ORIGIN and AS-PATH attributes: *10.0.1.0/24, ORIGIN{AS4}, AS-PATH{AS4}*.



- a. Assume that no routing policies are employed (i.e., no advertised routes are selectively ignored and all known routes are advertised). Explain how the other autonomous systems process and disseminate the advertisement for prefix 10.0.1.0/24. Indicate which autonomous systems advertise the prefix to their neighboring autonomous systems. Provide the ORIGIN and AS-PATH attributes used in the advertisements.
- b. Now consider that autonomous systems AS1, AS2, and AS3 are transit networks, and AS4, AS5, and AS6 are stub networks. For each autonomous system, explain how the processing and advertisement for prefix 10.0.1.0/24 should be changed (compared with your answer to (a)).

Problem 2.

Explain Hot-Potato Routing and where it is used. Discuss an advantage and a disadvantage of Hot-Potato routing.

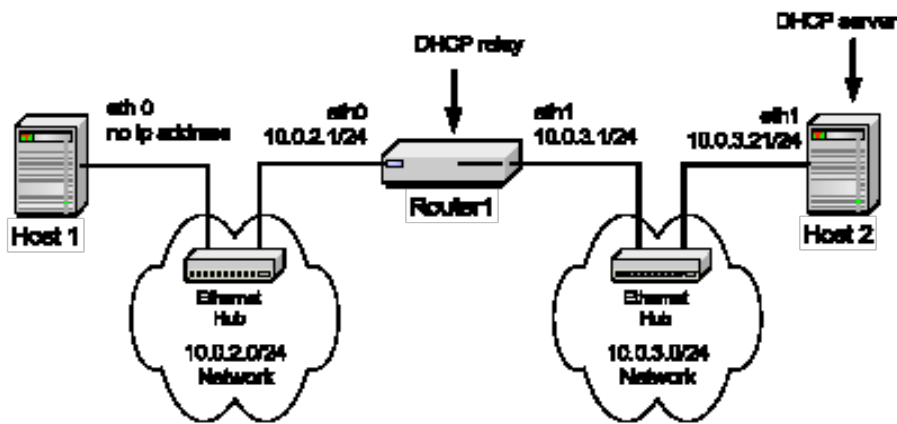
Problem 3.

Suppose a BGP router sees the following two advertisements for destination network 10.0.1.0/8:
10.0.1.0/8, AS-PATH { 202, 101, 89, 59}
10.0.1.0/8, AS-PATH { 876, 32}

Explain how the second advertised AS-PATH could result in a ~~shorter~~ longer route.

Problem 4.

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.



- Explain why Router1 needs to be configured as a DHCP relay server.
- Describe how the relay server processes and directs a DHCP Request from Host 1 and the DHCP Reply to Host 1. Does the DHCP relay server modify the IP headers of the DHCP packets?
- List the IP source and destination addresses in the DHCP Request and the DHCP Response. If the addresses are changed at Router1, show the original and the modified addresses.