

ECE 461 – Internetworking

Problem Sheet 2

Problem 1. Describe how class A, B, and C IP addresses are recognized in a binary representation of IP addresses ?

Problem 2.

- a) Why is a subnet of all zeros or all ones cannot be used in a classful routing environment?
- b) How many subnets are available if a class C address has six bits of subnetting? How many host addresses are available per subnet. (Hint: The problem statement of (a) contains a part of your answer.)

Problem 3. How would you express the entire Class B address space as a single CIDR advertisement?

Problem 4. Assume that you have been assigned the 198.42.180.0/22 block of IP addresses.

- a) Specify an extended network prefix that allows the creation of 200 hosts on each subnet.
- b) With your answer to (a), what is the maximum number of hosts that can be assigned to each subnet?
- c) With your answer *to* (a), what is the maximum number of subnets that can be defined?
- d) Give the IP address (in CIDR notation) of one of these subnets. Give the broadcast address for this subnet.

Problem 5. Aggregate the following set of four /24 IP network addresses to the highest degree possible.

212.56.132.0/24
212.56.133.0/24
212.56.134.0/24
212.56.135.0/24

Problem 6. Aggregate the following set of four /24 IP network addresses to the highest degree possible.

212.56.146.0/24
212.56.147.0/24
212.56.148.0/24
212.56.149.0/24

Problem 7.

- a) Provide the full 16 byte address (using hexadecimals) of the following abbreviated IPv6 addresses:
 - a. 2001:DB8:65A3::5D2E:0:34 ;
 - b. ::1 ;
 - c. FE80::E2F8:47FF:E44:2A08 .
- b) Explain why abbreviating an IPv6 address as 2001::DB8:65A3::EF:34 is not permitted.